

**COMPARATIVE STUDY OF SOCIAL ECONOMIC DIFFERENCES IN  
RELATION TO TECHNOLOGY COMPETENCY  
EXPECTATIONS AS PERCEIVED BY BUSINESS AND EDUCATION  
LEADERS**

A Dissertation

by

JANICE MAE REYNA

Submitted to the Office of Graduate Studies of  
Texas A&M University  
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

December 2005

Major Subject: Educational Human Resource Development

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**ABSTRACT**

Comparative Study of Social Economic Differences in  
Relation to Technology Competency  
Expectations as Perceived by Business and Education Leaders. (December 2005)

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This qualitative study investigated the urgent need for business and public schools to design a comprehensive system for preparing all students for a technological workplace, while giving them the necessary academic foundation for functioning effectively in a work environment. Businesses and communities need to participate with schools, regardless of where the schools are located. Schools, businesses and communities must explore and work together to create new methods for supporting technology in schools and in the workplace.

The interviewees who participated in the study consisted of 21 teachers and administrators from four high schools located within four districts in San Antonio, Texas. Two of the high schools were located in southern San Antonio and were classified as lower socioeconomic institutions. The other two high schools were located in northern San Antonio and were classified as upper socioeconomic institutions. Also, seven business leaders were interviewed from (1) grocery, (2) San

Antonio city government, (3) military, (4) large retail chain, (5) technology organization and business, (6) telecommunications, and (7) a youth-oriented organization.

The major conclusions of the study were that businesses believe that a skill-deficient workplace hampers economic growth and productivity, and a knowledge-deficient high school graduate limits his or her opportunities for an extended academic experience. Few businesses in San Antonio supported or contributed to technology competencies in the selected schools in San Antonio by participating in curriculum development or as partnerships within the schools.

All teachers had a high level of understanding about the importance of technology competencies for students. Furthermore, they believed that teachers and administrators must have a well-organized and fluid technology training program that will help integration of technology into the curriculum. Schools within the lower socioeconomic classification did not have many opportunities for training or access to technology; therefore, the teachers did not have the opportunity for building their competencies. In comparison, the schools located in northern San Antonio had more than adequate opportunities for training and access to technology. Educational, business, and community organizations must be concerned with all aspects of student learning and their ability to utilize technology. It is not enough to supply hardware and software to schools.

## DEDICATION

I would like to dedicate my dissertation to my family and John, who never wavered in their support in everything that I have tried to accomplish. John, I recognize your commitment and I want to thank you for believing in me. I thank you for the wonderful experience and I will try my hardest to give back in every way possible. Thank you for showing to me over and over again that people are good and that love, trust, and tranquility can be forever. I would also like to thank in particular, my father and my beloved mother who always have and still provide me with an example of what true love should be and how to live my life with honor and respect. Thank you so much for supporting me in all the loving ways that are pure and good. Gayle, I love you so much for helping me and standing by me as the most wonderful big sister; more than I could ever hope for. Thank you for always forgiving me and loving me. Kris, thank you for showing me that I could achieve all that I dreamed of through a strong and beautiful example of strength and perseverance. I would like to also thank my friend Yvonne and the others at ETS who always encouraged me to move forward. Thanks to my new family at the College Board, Michelle (my roommate) Gail, Becky, David and Rashida. Thank you for allowing for me to be part of your family. Gail, thank you for showing me such courage to live life like you love it every day.

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## CHAPTER I

### INTRODUCTION

#### **Background of the Study**

Over the last decade, America's educational system has come under intense scrutiny. Recent legislation calls for state, district, and student accountability never before imposed on public schools that have changed the landscape of schools across the nation. Current educational programs, under the new legislative mandate, place technology in the service of learning and not as a stand-alone enterprise (Serim, 2003). This legislation, called *No Child Left Behind* (NCLB), incorporates high-stakes testing for core subject areas that could potentially influence and change a student's educational experience. Beyond the core subjects, students are required to be technologically literate by the end of the eighth grade. Major penalties for not achieving the year-to-year escalation of progress benchmarks (adequate yearly progress) could mean withholding of federal funding, student promotion, and loss of a school's status and even student population because of low scores.

School decisions are now more difficult and filtered through the consequences of failing to meet the Adequate Yearly Progress requirements, which would influence whether a school receives federal funding. Positioning of curriculum and allocation

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The style and format for this dissertation follow that of the *Journal of Educational Research*.

of resources has intensified as teachers attempt to develop new and better methodologies to meet the government-mandated criteria. The NCLB legislation, moreover, is designed to ensure that every student has an equal opportunity for a quality education, for securing employment, and for contributing to society as a productive citizen. This federal mandate means that funding support is critical for meeting these enforced standards of student achievement. Schools find themselves in a quandary because they have to meet a new academic demand, which requires more resources, but are subject to having funding withdrawn if they do not increase student assessment numbers. In addition, schools are expected to purchase more costly computers. Schools and districts nationwide claim the new legislation is underfunded and financially crippling. Further, the NCLB standards require that technology skills be incorporated into every core subject area.

### **Educational Technology Title II Part D, No Child Left Behind Overview by the Texas Education Agency**

*Purposes.* The purposes of Title II Part D are:

1. To provide assistance to states and localities for the implementation and support of a comprehensive system that effectively uses technology in elementary schools and secondary schools to improve student academic achievement.
2. To encourage the establishment or expansion of initiatives, including initiatives involving public-private partnerships, designed to increase access to technology, particularly in schools served by high-need local education

agencies. To assist states in the acquisition, development, interconnection, implementation, improvement, and maintenance of an effective educational technology infrastructure in a manner that expands access to technology for students (particularly disadvantaged students) and teachers. To promote initiatives that provide schoolteachers, principals, and administrators with the capacity to become aligned with State academic content and student academic achievement standards through such means as high-quality professional development programs.

4. To enhance the ongoing professional development of teachers, principals, and administrators by providing continual access to training and updated research in teaching and learning through electronic means. To support the development and utilization of electronic networks and other innovative methods, such as distance learning, delivering specialized or rigorous academic courses and curricula for students in areas that would not otherwise have access to such courses and curricula, particularly in geographically isolated regions.
5. To support the rigorous evaluation of programs funded under this part, particularly regarding the impact of such programs on student academic achievement, and ensure that result information is widely accessible through electronic means. To support local efforts using technology to promote parent and family involvement in education and communication among students, parents, teachers, principals, and administrators.

*Primary Goal.* The primary goal is to improve student academic achievement through the use of technology in elementary schools and secondary schools, to assist every student in crossing the digital divide by ensuring that every student is technology literate by the time the student finishes the eighth grade, and to encourage the effective integration of technology resources and systems with teacher training and curriculum development to establish research-based instructional methods that can be widely implemented as best practices by State education agencies and local education agencies (Givens, Buckner, Little, & Wyatt, 2003).

Serim (2003) conducted research that addressed aspects of technology in K-12 education by questioning whether the purpose of using technology is to prepare the student as a contributor for upholding the future global economy in a growing and competitive workplace. If the answer is yes, and businesses are the beneficiary of such a program, how are businesses involved in the process and what do they perceive as important? What technology skill competencies do businesses perceive as important as students enter the workforce?

There have been impressive gains in the access and use of technology. Serim (2003) states that teachers are able to provide access to the Internet for 95% - 98% of the students in school. Teachers' access to e-mail accounts has grown from 68.2% to 85.3% over the last two years and has become a major element in securing active communication with school administration, other teachers, parents, and the community. Teachers' use of the Internet has grown from 75.7% to 90.3% over the last two years.

Serim (2003) however, makes the distinction between “buying stuff” and “using stuff” to produce achievement. How is it possible or how will we identify the rewards that are being produced by all the millions of dollars that taxpayers have invested in technology for schools? Is the public willing to continuously pour money into technology programs that may or may not be the means to an end for securing global economic prosperity?

All high school students, regardless of economic, socioeconomic conditions, or location need to receive a level of technology competencies. The discrepancy between technology “haves” and “have-nots,” currently identified as being the Digital Divide, is the gap between people who have access to technology in schools. Although a record number of Americans are online, the gap between the “haves” and “have-nots” is growing. Most importantly, the social gaps in society, which initially caused the Digital Divide, may intensify existing gaps and create new divisions (Latimer, 2001). Swain and Pearson (2002) further describe digital divide studies as often measuring access to the technology; yet, access alone does not ensure equity. Merely counting computers and the number of times a student can use a school computer will not eliminate the digital divide problem in the schools systems. In order to gain insight into these issues they conducted an analysis of 28 studies and looked for areas that concentrated in the area of educational technologies. They found three areas that appear to impact the digital divide in schools: frequency of use, the differences in students’ experiences with respect to computer use, and educational technology professional development for teachers. From their research, they found that all of these areas must be addressed to reduce inequality when dealing with

technology. Issuing a computer to an administrator, teacher, or a student will not resolve the lack of technology access and usage in schools. There must be a more comprehensive program implemented that will address other prevalent issues such as building a long-lasting relationship with the community, parents, and businesses.

Many schools have opened their doors to businesses in hopes of acquiring knowledge, mentors, and possible funding for their schools. Rittner-Heir (2003) discusses how businesses can benefit from these partnerships for the purpose of building a foundation in their future workforce. Rittner-Heir found the following: Not only is private industry looking to provide a means for training and grooming its future workforce, it sees an investment in a community's educational infrastructure as a means of promoting employee retention. It also helps to provide world-learning opportunities for students and needed services to the public (p. 16).

No one would argue that making the transition from youth to adulthood is easy, even under the best of circumstances. The Anne E. Casey Foundation (2004) states that many believe that a high school diploma or a higher degree will ensure a permanent job and entrance into adulthood. The Anne E. Casey Foundation reports that nearly one in six young adults ages 18-24 are having difficulty meeting that standard. There are 3.8 million young people who have not graduated from high school, are not currently in school, and are not working. They have been categorized as the "disconnected" group within the U.S. They report that a large share of this country's young people are about to enter adulthood without the skills, support, knowledge, relationships, or opportunities they need to succeed as adults. They have

been perceived as not having adequate competencies, which ultimately can be traced back to the public school system's inability to embrace technology and innovation.

Many believe that schools need to begin a radical period of change and advancement because the education system is not changing what and how subject areas are being taught. The education system must keep pace with industry as they rapidly escalate and progress. Schools are becoming more and more antiquated and, therefore, will produce employees who will not have the skills to build the future economy. Melle, Cimellaro, and Shulha (2003) encourage schools to implement systemic change that will be global in nature, rather than trying to implement periodical, spotty, and isolated radical change in schools. These changes must be far-reaching and involve whole system changes in curriculum, faculty development, securing and maintaining adequate resources, and ongoing evaluation and accountability. Their research suggests the development of collaborative efforts among all stakeholders. Schools need to work closely with many external stakeholders to establish mutual purposes and share responsibilities. For example, business partnerships provide sponsorships and leadership of projects and, in return, the businesses expect to expand on their business interests. In support of business participation and the maintenance of a strong competitive workforce, the government must take responsibility for funding and setting standards among schools as they have with the NCLB legislation. Even with incredible support from businesses and government agencies, schools need a wide array of resources besides technology. Increasingly, school administrators are perplexed about where to place emphasis; to

enforce and purchase technology equipment and materials or purchase academic materials to support student achievement.

Many businesses have faith in the public schools and high school students. Brotherton (2002) explains how trainers at Benchmark, a full-service technical training company in Minnesota, had received complaints from their clients about the struggle to find skilled workers. Benchmark surmised that with appropriate training, junior and senior high school students could help their clients with acquiring skilled workers. The students would acquire practical training which would prepare them for the workplace environment. Benchmark believed that information technology is a hybrid that can be pursued through any means and the skills will transfer to any vocation. Benchmark approached other companies to help fund the venture but was turned away. Benchmark trained 10 students to go through a training program that would help them acquire jobs. They were emphatic in the belief that 4-year college students are not the only answer for companies. Many of the students who have a natural aptitude for computers have the motivation to be successful on the job, regardless if they have a degree. The program has earned Benchmark awards from many different areas and the company hopes to convince other businesses to have the same faith in the ability of young people to perform tasks in the workplace.

To ensure a viable and available workforce, the company Intel is also contributing resources that will help students grow to meet the demands of the 21<sup>st</sup> century workplace. Intel expressed concern that its home base, Rio Rancho, California would not have the high-caliber employees needed in a competitive market (Rittner-Heir, 2003). Intel believes that workforce development should be a part of the educational

process in public schools. They believe that businesses will either spend money on training while students are in school, or spend money for training after they become employees. They are trying to employ a long-term solution by helping schools acquire technology skills and help to develop employment and life skills that will help them gain employment either while in high school or after. Intel notes that quality of life issues always find their way into the education system when it comes to retaining and attracting quality workers. Businesses, moreover, react once they realize there may be a problem with the supply of qualified workers that could threaten future profitability.

### **Purpose of the Study**

The primary purpose of this study was to examine business and educational leaders' perceptions of necessary technology competencies of high school students in different socioeconomic and geographic areas in selected schools and businesses in San Antonio, Texas. Carter, McCarroll, and Popek (1998) found that high school students have insufficient employment skills and are unable to meet the demands of their employers. Moreover, as requirements rise in the workplace, school and business expectations rise for only the segment of society that has the means for acquiring the necessary skills for future employment. This, in essence, means that for students and graduating students entering into careers is increasingly chaotic because of the growing gap between the capabilities of high school students and the skills and knowledge that are required by the employees.

## **Statement of the Problem**

There is an urgent need for business and public schools to design a comprehensive system for preparing all students for a technological workplace while giving them the academic foundation needed for functioning effectively in a work environment. New methods of information technology have forced a restructuring of schools and the workplace. A skill-deficient workplace hampers economic growth and productivity; however, a knowledge-deficient high school graduate limits his or her opportunities for an extended academic experience.

NCLB legislation has additional requirements for student achievement and school accountability that are tied to funding. Schools are trying to meet the demands of the mandate, but are struggling because of budget cuts and growing expenses outlined in the legislation.

Educational and businesses organizations must be concerned with certain aspects of student learning and their ability to utilize technology. It is not enough to supply hardware and software to schools. Teachers need continuous training in technology applications so the integration of technology can be consistent across the curriculum. Many teachers believe that businesses' are only concerned with bottom-line profits and economic viability and believe it is the schools' responsibility to provide students with all the skills needed for the future.

Gibson (2001) suggested that under the right conditions technology accelerates, enriches, and deepens basic skills; motivates and engages students in learning; helps relate academics to the practices of today's work force; increases economic viability of tomorrow's workers; strengthens teaching; contributes to change in schools; and

connects schools to the world. All of these aspects are extremely important, yet without the cooperation and involvement of businesses and community, it is like trying to reach a goal without a solid foundation that will support and sustain change.

### **Research Questions**

This study addressed the following questions.

1. To what extent do businesses in San Antonio, Texas contribute to technology competencies in selected schools in San Antonio, Texas?
2. To what extent do businesses influence high school technology curriculums in San Antonio, Texas as perceived by teachers, administrators, and business leaders?
3. To what extent do business and school leaders' expectations of technology competencies of high school students in selected high schools decline because of lower socioeconomic conditions and geographic areas in San Antonio, Texas?
4. To what extent do administrators and teachers perceive the importance of technology competencies for selected high school students for future employment?

## Operational Definitions

The following definitions are significant in this study.

**All Students**—Includes all students from a broad range of backgrounds and circumstances including disadvantaged, diverse ethnic groups, and cultural backgrounds.

**Academic Success**—As defined by the Texas Education Agency (2003, p. 6):

All Texas students will graduate with a world-class education. All Texas graduates will contribute to the progress of their families, their communities, and our world.

Preparation for graduation from a world-class system of public education begins at home and on the first day of the first year of school. The promise of the Texas public school system is that every student will be challenged, and every student will have the instruction, opportunity, and support needed to succeed.

TEA has two roles in accomplishing its mission.

The first is to provide program leadership in Texas school districts and open enrollment charter schools by implementing curriculum standards, an assessment system, and education programs to ensure success for all Texas students.

The second is to attain excellence in its operations by ensuring school districts, policymakers, and the public that funding is efficient, accountability is meaningful, and monitoring, and accreditations visits are efficient and aligned with state and federal regulations.

To achieve its mission, TEA must operate strategically, implementing the policy decisions of the Texas Legislature, developing partnerships with educators and administrators to ensure that all students are challenged and have the resources and support needed to achieve well-defined standards of success, and working with the federal government to provide the public education system the flexibility needed to support student achievement.

The agency must also operate tactically ensuring school districts, policymakers, and the public that it achieves excellence and efficiency in its operations by maximizing funding to school districts, ensuring the accountability system is a meaningful indicator of district, charter, and campus success, ensuring its business operations are efficient, and ensuring its human resources are deployed effectively.

**Administrator**—An individual who is assigned a portion of authority to ensure correct program implementation.

**Barriers to Access**—(1) lack of elementary digital experience caused by lack of interest, computer anxiety, and unattractiveness of the new technology; (2) lack of computers and network connections; (3) lack of digital skills caused by insufficient user-friendliness and inadequate education or social support; (4) lack of significant usage opportunities (Hacker & Jan, 2003).

**Basic Academic Skills**—(From the Texas Statutes and Education Code 4.0001 (2003): Texas Education Code, Title 2, Public Education; Subtitle A, General Provisions; Chapter 4, Public Education Mission, Objectives, and Goals. §4.0001, Public Education, Mission, Objectives, and Goals). (a) The mission of the public education system of this state is to ensure that all Texas children have access to a quality education that enables them to achieve their potential and fully participate now and in the future in the social, economic, and educational opportunities of our state and nation. That mission is grounded on the conviction that a general diffusion of knowledge is essential for the welfare of this state and for the preservation of the liberties and rights of citizens. It is further grounded on the conviction that a successful public education system is directly related to a strong, dedicated, and supportive family and that parental involvement in the school is essential for the maximum educational achievement of a child. (b) The objectives of public education are: (1) Parents will be full partners with educators in the education of their children. (2) Students will be encouraged and challenged to meet their full educational potential. (3) Through enhanced dropout prevention efforts, all students will remain

in school until they obtain a high school diploma. (4) A well-balanced and appropriate curriculum will be provided to all students. (5) Educators will prepare students to be thoughtful, active citizens who have an appreciation for the basic values of our state and national heritage and who can understand and productively function in a free enterprise society. (6) Qualified and highly effective personnel will be recruited, developed, and retained. (7) The state's students will demonstrate exemplary performance in comparison to national and international standards. (8) School campuses will maintain a safe and disciplined environment conducive to student learning. (9) Educators will keep abreast of the development of creative and innovative techniques in instruction and administration using those techniques as appropriate to improve student learning. (10) Technology will be implemented and used to increase the effectiveness of student learning, instructional management, staff development, and administration.

**Business Leaders**—Those people who have extended responsibilities and manage a workforce within the company. The business leader would participate in the creation of in-training activities, recruitment of employees and retention, and are responsible for the profitability of the company.

**Business Success**—A company's pursuit of achieving targeted profitability goals. The actual mechanics involved in running a business on a daily basis. This includes areas such as payroll, hiring and firing, customer service, and management of human resources.

**Demographics Characteristics**—Characteristics such as age, race, and socioeconomic status.

**Digital Divide**—The discrepancy between technology “haves” and “have-nots”—the gap between those who have access to technology and the means or expertise to utilize the technologies. The “haves” are children that are presumably white, wealthy, and urban Americans with computer and Internet access. The “have-nots” are minority, poor, and rural Americans who lack computers and Web access (Quay, 2001).

**Educational Leader**—One who takes charge of an education organization or group.

**Grounded Theory**—The documentation and theory that emerges during data collection and analysis stage of the research.

**Naturalist Inquiry**—No manipulation while collecting data and the inquirer imposes no priori units on the outcome. Naturalist inquiry is what the investigator does (Guba & Lincoln, 1985, p. 8).

**High School Students**—Students who are from the ages of 16-18 and are still attending high school in San Antonio, Texas. Students could be working part-time or have full-time jobs during the educational calendar year, which is August through May.

**Qualitative Research**—Denzin and Lincoln (1994) found through qualitative research that the researcher stresses the socially constructed nature of reality, the intimate relationship between the researcher and what is studied, and the situational constraints that shape inquiry. Through the research, the researcher seeks answers to questions that stress how social experience is created and given meaning (p. 4).

**Successful Business Operations**—The best practices that produce superior performance in key business topics. In pinpointing specific performance gaps, companies can develop a road map for improvement that will enhance revenue, efficiency, and overall operations. A business from 1990 to the future must “distribute power while increasing self-discipline, system thinking skills as well developed as reductionist skills, improved conversations, and voluntary followership” (Senge, Kleiner, Roberts, Ross, & Smith, 1994, p. 15).

**Technology**—Satchwell and Dugger (1996) defined technology by developing four different categories and characteristics: (1) Technology is applied human knowledge; it is more than applied science. (2) Technology is application based; it is a combination of knowing, thinking and doing. (3) Technology extends human capacity; it enables humans to adapt and change the physical world around them. (4) technology exists in social domains as well as physical domains. There are both “hard technologies” (e.g., tools, equipment, etc.) and “soft: technologies (e.g. management, systems, software, Internet, etc.). Technology is defined as “human innovation in action ... the generation of knowledge and processes to develop systems that solve problems and extend human capabilities” (p. 16).

**Technology Competencies**—Texas Essential Knowledge and Skills technology standards. The basis skills are (as they apply to elementary, middle school, and high school): Use a mouse to successfully operate a computer; use a keyboard to successfully operate a computer; keyboard; use a keyboard monitor; use a computer printer; use a scanner; use a digital camera; operate a VCR; operate an audio tape player; use interactive books; use developmentally appropriate multimedia

encyclopedias; use content-specific education software to support learning; use a variety of nonprint media sources for directed and independent learning activities; use a word processor; use computers to compose texts; use computers to compose graphical representations; use multimedia authoring tools; use computers to search a variety of databases; use data collection probes; use calculators; use e-mail; participate in online discussions; use a browser to navigate the World Wide Web; use search engines to locate and access remote information; communicate technology using accurate terminology; demonstrate knowledge of video conventions; demonstrate knowledge of computing conventions; give examples of situations where more information is needed to solve a problem; state one broad question that will help in finding needed information; list several information sources and state the kind of information found in each; list ideas for identifying and finding needed information; describe several ways to organize information; name a variety of formats for presenting different kinds of information; practice responsible use of technology systems and software; work cooperatively using technology; use content-specific computer simulations to support learning; use exploratory environments to support learning; use environmental probes; use graphing calculators; use computers to search the Internet; use communications and computing technologies to locate information efficiently; determine when more information is needed to solve a given information problem; state broad and specific questions that will help in finding needed information; brainstorm a range of information sources to meet a specific information need; use productivity tools and peripherals to support group collaboration; take notes and gather data from nonprint sources; use online information resources for research;

use technology tools and resources for managing personal/professional information; use technology tools and resources for communicating personal/professional information; use online resources to enhance personal/professional productivity; discuss real-world applications of expert systems; discuss real-world applications of intelligent agents; discuss real-world applications of simulations; choose the most appropriate formats for presenting a range of information; explore a range of sources to find information of personal/professional interest; recognize gaps in one's own knowledge and appropriate strategies for closing them; use and cite others' work appropriately and correctly (Swan, Cocks, Richardson, & Richardson, 2002).

**Workplace Technology Competencies as Defined by SCANS**—Works with a variety of technologies. (1) selects technology—chooses procedures, tools, or equipment including computers and related technologies; (2) applies technology to task—understands intent and proper procedures for setup and operation of equipment; maintains and troubleshoots equipment—prevents, identifies, or solves problems with equipment, including computers and other technologies (Wise, Wei, & Rudner, 1990).

## **Assumptions**

Since this study encompasses retroactive review of data, it was assumed that:

1. Respondents understood the human instrument and responded objectively and honestly.
2. The researcher was impartial in collecting and analyzing the data.
3. Technology skill areas are necessary skills for the workplace.
4. Business leaders in the study will be able to identify needed technology competencies in terms of how it is defined by their organization.
5. Teachers are able to define technology competencies by federal and state boards of education.
6. Interpretations of the data collected accurately reflect what was intended.

## **Significance of the Study**

Technology has been accepted as a powerful tool for social and economic change. As a result, many agendas are being inserted into the education arena to reinforce and support the use of technology in schools. We must understand the expectations of businesses to better understand the context of technology in education.

Business and industry have made it very clear that they need and expect a better-prepared employee—an employee with advanced technology skills who can perform consistency in a dynamic work setting.

Educators and business leaders are responsible for eliminating the disparity of technology skills between school and the workplace. By comparing the existing

expectations of workplace skills, insight can be gained that will help support and transform high school curriculums into a dynamic, systemic system that will produce students, regardless of geographic location, who are prepared for leadership roles in the 21<sup>st</sup> century workplace.

## **CHAPTER II**

### **REVIEW OF THE LITERATURE**

This chapter presents a review of current and relevant literature related to the subsequent study. The sections are organized by comparative components, which will be assessed during the study. Section 1 is a review current and historical business and education philosophies. Section 2 examines how technology has directly affected our economic and human systems. Section 3, a transitional section, examines the impact of technology on business and educational systems and expectations of technology competencies for high school students. Finally, Section 4 compares the competency expectations and access in higher and lower socio-economic and geographical areas.

This format will help categorize the data as it is associated with the research questions and will, ultimately, frame the way in which the data are organized and presented in Chapters III and IV.

#### **Section 1. Review of Historical and Current Business and Educational Technology Philosophies. How Do These Philosophies Relate To Technology Competencies in Schools?**

Technology has been the most influential force that has affected education over the last 50 years. It is very important, therefore, to examine the structure of the community and the political and educational environments as influences change how they accept and respond to innovation. Oakes, Welner, Yonezawa, and Allen (1998)

discussed the influence of the community and how it affects educational change. Through their research, they found that the context of the community in which the school is located often affects the “zone” or parameters of discussion that will be allowed in relation to specific change and reform. Schools are therefore limited in their actions and are consequently affected by political and ideological forces. This is referred to as the “zone of tolerance.” Oakes et al. (1998) explain that the idea of the zone of tolerance examines how the local community forces interaction with regional, national, and global levels of ideology. This can be seen when a school is attempting to adopt new textbooks, historical in nature, for the district. This may be not only a religious concern, but a political issue as well. This “zone of tolerance” forms a set of boundaries that can either inhibit change or facilitate change. They referred to this as the “mediation zone.” This zone is reinforced by mediations among people, between people, and by outside forces. Another example would be how a business may need to change a district’s image in a well-planned publicity campaign in order to change the zone boundaries. Each person’s frame of reference also affects the perimeters of a mediation zone. Researchers expanded their ideas by stating that critical inquiry should be part of the change process when dealing with politically and ideologically sensitive issues. Many of the social constructs related to these issues are grounded in the equity of forces within and outside of schools that must be examined if changes are to occur that would otherwise be hampered by the existing meditation zone.

Does anyone really accept as true that the next twenty years will be less turbulent than the prior 20 years? Senge, Roberts, Ross, Smith, and Kleiner (1999) declare that given the changes expected in technology, biology, medicine, social values,

demography, environment, and international relations, we can be reasonably certain that there will be continuing challenges that will tax our ability to deal with the challenges. They predict that if we have people working harder, rather than working together, it will be increasingly difficult as breakdowns occur within organizations. It will also be difficult for new innovations, such as in technology, to trickle down to the educational system where future employees are housed. Senge et al. (1999) describe this fragmentation and the “divide” between businesses and schools as far more serious than 10 years ago. Schools need to interact more as business organizations so they will be ready to accept innovations and create an environment where change is embraced instead of dreaded.

Schools, as organizations, are sometimes excluded from organizational theory because of historical patterns that are difficult to reform (Fullan, 1993, 1999, 2003). Schools have been extremely resistant and slow to change in contrast to the rapid change of innovation and technology within the business world. The result is that innovation simply bypasses school organizations. The innovation becomes outdated, useless to the school, and has no recognition or integration at the school level. Students leave school without the needed foundation of having a historical and systemic view of technology and innovation and are often unsuccessful at the next level of their lives, such as in college and/or in the workplace.

Fullan (1993, 1999, 2003) believes that organizational business theories need to be investigated and used as a model and theory for supporting comprehensive change in schools. First he recommends organizational theory which emphasizes the idea that it is very difficult to grasp the complexities and links behind cause and effect.

Change happens in an interrelated and systemic manner, which is nonlinear and has many oscillations when attempting to organize during chaotic situations or events. If these complexities and possible oscillations can be identified and discussed within environmental and organizational change, it is more bearable and less threatening to the organization (school). The second theory Fullan (1999) explains is called the evolutionary theory. This identifies characteristics within humans who are able to adapt over time in relation to interaction and cooperation. This social interaction and cooperation helps facilitate adaptation to change. Technology must be implemented in the school with total support of the social, political, and community structures.

Lastly, Fullan (1999) identifies the moral purpose and how using these theories to help improve public education should be used to unite people. This includes the ideals of moral purpose and improving the lives of citizens in the development of intellectual capital within the public schools, not just outside of the school boundaries. Social capital is framed in the context of developing traits such as compassion, honesty, fairness, trust, and civility. Fullan asserts that intellectual capital is the fostering of problem-solving skills in a technological world and must be reinforced in the schools.

Fullan (1999) supports the idea that creativity and anxiety go hand in hand. For example, when people are trying to learn something new they are apprehensive and afraid of not understanding. Fullan explains that organizational environments that are emotionally supportive help deal with this anxiety to facilitate creativity rather than allowing for growth to be impeded by fear. For technological change to be embraced in schools there must be an inclusion of emotional support necessary for long-term

change. Change for many people is difficult and additional pressures and problems within the school workplace can be almost unbearable for teachers, administrators, and district leaders.

Fullan (1999) recommends that schools should require three major elements. He encourages all elements of society such as businesses, political and government agencies, and schools to implement these elements. First, is the power of the intellectual knowledge creation through the use of new ideas and information. Second, it is imperative that schools establish positive political alliances with diverse elements within the communities. Finally, schools must establish a spiritual dimension where education must include a moral purpose in improving the lives of others. Together these elements will provide the energy and support to sustain change.

Findings from Wilhelm and Kubicek (2002) state that the Benton Foundation, a private foundation that promotes vision and policy for the digital age, views schools as the main focus of government and business activities in the beginning of the 21<sup>st</sup> century. Wilhelm and Kubicek found that businesses and schools must look beyond all present relationships and consider other possibilities of youth work outside of the current structure. The students need support beyond what technology can bring to their learning process. Further, Wilhelm and Kubicek conclude that this means much more than an Internet or a computer driver's license. As a society, we must not only address computer-to-student relationships, but also attend to all relationships which include the human growth factor as well.

As interest on the construct of the business perspective grows, Wilhelm and Kubicek (2002) indicates that from a business perspective, people live in an e-world environment where digital literacy—familiarity with media and technology—is increasingly necessary to establish a full social, civic, and professional engagement. According to the European Commission, about half of the European workers use information and communication technology on the job and the number is steadily increasing (Wilhelm & Kubicek, 2002). While this may be true, many children and youth experience geography, poverty, illiteracy, disability, or disconnection that separates disadvantaged students from using technology, whereas their counterparts, the affluent student use these tools everyday at home and at school. This separates students from opportunities for employment and economic and social involvement. This is not offering children equal access to a secure future. Wilhelm & Kubicek further explain that for industry, the link is clear: Technology can boost the skilled workforce, and is linked to flexibility, effective communication and team skills. The acquisition of these skills however, should not be for just a privileged segment of the population.

At the heart of the reform movement in American's schools, Gibson (2001) describes the belief that there cannot be divisions between the philosophies that organizations hold as a catalyst for behavior. There must be instead a shared dependence, which underlines whether projects will be successful. Technology projects that are implemented nation-wide, state-wide, district-wide, school-wide, and classroom-wide are dependent on a unique set of partnerships and agreements. Many technology projects cannot survive without the strong commitment and ongoing

involvement of community groups. There must be a consistent, fluid, and equal distribution of support and interaction between business organizations, business leaders, and schools.

This can be seen in some programs, which are somewhat exclusive and isolated throughout the U.S. Gibson (2001) outlines a project in a small rural school community in Kansas. This collaborative venture incorporated banks, technology companies, financial advisors, and multiple community partnerships. Without this partnership effort, there would not have been the energy, resources, or cohesiveness to implement the project or sustain it over time. The businesses offered support and encouragement and helped supply the resources needed to implement technology effectively in the schools. The project is still in progress and has shown successful results such as higher academic achievement and improved motivation of students that were classified as potential dropouts as well as students that were classified as high achievers. The technology project acted as an equalizer across academic, racial, and economic boundaries.

Hypki (2002) explains that educators must define how people are going to implement an infrastructure that decides whether the public or private sectors should be responsible for supporting and sustaining information technology initiatives. Hypki expresses that most public schools are technologically obsolete and are not teaching skills that businesses need. Many believe that our society puts huge amounts of money into technology and schools but with few benefits that could be identified for either students or their families. There is a continuous outcry for more assistance within the public education system for additional resources.

Oppenheimer (2003) reflects about partnerships with businesses and schools and the overall outcomes of those partnerships. Funding, or more importantly, lack of funding dictates a more involved society that supports schools in ways that are much more influential than just simply providing funding for specific workplace involvement and partnerships. Businesses often do not adequately prepare schools, rich or poor, for the installation and implementation of technology systems. For example, the Ohio Governor Volinovich, a proponent for interaction between business and schools, referred to a distance-learning project which was considered to be a fine example of public/private partnerships. He stated during his yearly status report, "We must explore projects like this to eliminate the problems our rural schools are experiencing" (p. 13). Hours after the statement, the distance learning project was discontinued. There was not a permanent distance learning connection established for the schools. The project was seen as being more of a political positioning and platforming instead of a viable breakthrough that could have solidified business and school activities throughout the state. The partnership stopped and so did connectivity for hundreds of schools. Oppenheimer (2003) states that while this may seem discouraging, it does not mean that industry is incapable of partnering with schools in a positive manner. School-to-work arrangements have been moderately successful though plagued with complaints that employers neglect to give young people any attention, place them in menial jobs, or inadequately train them to do jobs that are immediately needed by the company.

Schools are faced with a lack of resources and increasing demands to improve academic performance. Many schools, therefore, are turning to businesses for

resources that range from computers to educational materials, career mentorships, and exclusive vending rights within the school. Larson (2001) reported that in exchange, businesses receive benefits ranging from exclusive vending rights, advertising space in school hallways and school sports arena. Businesses motivation is to develop an early relationship with the consumer thus, increasing the possibility of creating a life-long loyal customer. Many believe that this is a blurring of lines between an advertising venture for the businesses and the ethical practices of using the schools to achieve profitability without contributing to a true-way partnership through an exchange of mentoring and the exchange of information. School administrators often feel stuck with these types of arrangements and believe that this is a misplacement of what could be contributed to and better used by the schools. The administrators, however, often feel compelled to use whatever means necessary to acquire desperately needed resources for the schools.

The Edison Schools project is a business school model that has swept the country in recent years. Founded in 1992, Edison Schools are the nation's leading business partner with public schools and school districts. Their focus is to raise student achievement through the use of a research-based school design, a uniquely aligned assessment systems, and the integrated use of technology. Oppenheimer (2003) explains the Edison project reflects a business atmosphere of private-sector efficiency to schools. "Each student is given their own workstation without textbooks or classrooms. Teachers are given offices and cell phones, just like real people" (p. 236). Things went awry however, as businesses did not see any way to make a profit from the school investment. Chris Whittle, the founder of Channel One and now the

founder of the Edison Schools, claims that student test scores have risen after his company participated in school activities. These data, however, were not solidified by outside evaluators and contract cancellations followed the next summer. Researchers found that Edison Schools were having difficulty retaining teachers. Their curriculum often veered from the state standards and more ironically, the operation functioned inefficiently under a costly business model.

Oppenheimer (2003) explains why schools are having economic difficulty as they purchase more and more technology hardware and software.

In the midst of this gaping landscape of school poverty, perhaps the saddest irony of all is that schools keep on purchasing fancy new gear that continually needs upgrades and repairs. In the face of this devil's bargain, schools, and many different educators and institutions involved in schools, will have to keep finding ways to live with halfway measures. They could do so if they simply scaled back their technology campaign and promised schools nothing more than a set of last year's computers and assortment of recycled machines. If these commitments could be coupled with today's level of technical support-and if teachers and computer maintenance staffs could be trained on equipment that wasn't upgraded as soon as they mastered it-then schools might finally reach a long-needed level of equilibrium. (p. 404)

Fragmentation between existing entities, schools, and businesses remains without a concrete connection or with connection possibilities. According to Norris, Sullivan, and Poirot (2003), schools go through their days ignorant of the profound changes caused by computing technologies in many other areas of everyday life, from

manufacturing practices to new scientific research methods, and from new business practices to new methods for creating music and art. Many schools remain static and uninformed. Some schools have tried the technology “chasing tail” experience and choose to remain focused on passing standardized tests and securing federal funding. Countless schools and school leaders have gone through so many reform movements that they have become desensitized to the “next new fangled” program that they feel has been literally shoved down their throats.

There are times that interaction between businesses and schools have been successful, but remain to be isolated, short-lived and spotty. Crane, Wilson, Maurizio, Bealkowski, Bruett, Jeannero, Couch, and O’Brien (2003) describe an example of the “new industry” when the American Film Institute worked with educators in Montgomery County (MD) Public Schools to develop an educational guide to screen literacy, which is defined as the ability to read and write for the screens of computer, television, cinema and the Internet. The experiment was very successful and was repeated the next year. Another example was the Pittsburgh Technology Council, a trade group with 1500 members, offering several programs to help local schools prepare students for the future. This type of relationship exposed the students to robotic technologies, digital logic, computer applications, technical writing, and drawings all of which were integrated into core subjects. This was an important example of integrating technology into the curriculum seamlessly with work-related input from business, a win-win for all participants. Crane et al. give these types of programs praise, but also makes the point that these are isolated

examples that rarely are long-term projects. He also states that this is a change of mindset and must incorporate a commitment that does not end when the project ends.

## **Section 2. Examination of How Technology Has Directly Affected Economic and Human Systems**

Kozleski (2004) explains how historically notions of differentiated functions, decontextualized activity, and economy of scale dominated the 19th century. Schools today remain connected to the economic growth experienced in the 19<sup>th</sup> century that created jobs in an industrial economy. Schools function from this reproduced assembly line production mentality. Kozleski states that the gap between the skills of graduates from our public system and the skills needed by business and industry to compete in a global economy is widening. Schools are using teaching-by-telling, rote memorization, one method, one answer, memorizing rules, template exercises, and routine worksheets. Many businesses endorsed this method because employees were required to pay attention to directions and complete repetitive tasks in the workplace. Kozleski states:

Workers must have skills in decision making, collaborative leadership, information analysis, and self-directed learning. The glacial infiltration of digital technology into the classrooms provides an important opportunity to understand how inadequate linear conceptions of knowledge diffusion. (p. 184)

Our country's current economic stability is dependent on technological progress (Packer, 1992). This requires that all levels of economic and educational entities secure our future workforce. Our failure to change how and what our schools teach could put our country on a downward path toward low skills, low productivity, and low wages. In a very real sense, if we do not provide a systemic education, which includes technology skills, we are failing our children and shortchanging both their future and ours (Packer, 1992).

Honey, McMillan, and Carrigg (2000) explain that research supports that schools have begun to learn about the roles that technology can play in helping recognition of the educational workplace. Businesses, administrators, and teachers have come to appreciate the powerful role technology can play in creating new links between schools and the world outside the schools, connecting individuals, providing resources, and broadening the political and cultural contexts available for examination and exploration.

A study conducted by the Cohen and Burton (2001) emphasized that the "new economy" of the 90s has been upset by the downfall of many dot.com businesses. The marketplace however, remains strong in the demand for IT (information technology) workers; further, they estimate that 425,000 jobs will go unfilled because of the lack of applicants with technology skills. The study also found that 1 in every 14 U.S. workers are involved in information technology and 1 in every 12 technology jobs went unfilled from the lack of an appropriately skilled applicant. Employers will attempt to fill over 900,000 new IT jobs in 2001. It is because of this shortage that colleges, universities, and private companies are increasingly collaborating with

schools in recognition of their civic responsibility and efforts to learn more about how to develop effective technology strategies. According to the Department of Commerce, the area of technology and the share of the economy that it contributes to doubled between 1977 and 1988. Since information technology is an enabling technology that affects the entire economy, a failure to meet the growing demand of technologically trained professionals could have severe consequences for the U.S. and its' economic growth and employment (Button, Cox, Stough, & Taylor, 2002). We have transferred many mixes of economic strengths to that of technology. This rapid growth has caused a very limited supply of available workers. Despite these rapid gains in the last decade, only half of all high school graduates in the U.S. complete algebra II or chemistry. Many students believe that universities do not offer proper training for technology-related employment. Additionally, many future students have the notion that professors at the university are not adequately trained in computer applications.

The United States and the rest of the world have been in the midst of a radical economic and social change. It is nothing short of revolutionary—computers and information technologies are transforming nearly every aspect of American life. Continued success as a nation will depend on providing our children with the skills and knowledge necessary for high-technology work and informed citizenship. Many students believe in the opportunities that will be available to them if they are able to acquire the correct level of technology skills (U.S. Department of Education, 1996). They state, “Technology is important to all the schools across the country, because without technology we’ll be second all the time. We don’t want to be second. We

need to be number one. In order to be smarter, we need to have technology” (p. 43) Students believe that without adequate technology skills they will be unable to acquire jobs regardless of the sector in which they want to work.

Wilhelm and Kubicek (2002) explain that businesses success often depends on how well employees can handle and exchange information, use technologies, and participate in increasingly interactive business structures. Ensuring that young people have better and greater access to technology with the training necessary to use it will boost employment options. Businesses however, do not see job training as their responsibility. Employees need to come to the workplace with a strong, competitive set of skills. Businesses believe, as taxpayers, they have already paid for the public school system to train future employees, thus businesses do not feel responsible for training and paying for them to be trained again.

Oppenheimer (2003) states that many believe that companies around the world will need more people with high-tech and quasi-scientific skills. Oppenheimer predicts that students will need to enter college with a previous knowledge of these high tech skills; otherwise, employers will fill their high-paying jobs with recruits from overseas. Business and political communities are again pointing their fingers at the schools as the cause and the solution. Schools however, can no longer meet these financial demands. For example, with the new NCLB legislation there is an added expense for states that has been essentially passed on to districts. Budgets tighten, as in the state of Texas to meet the legislative technology demands. Texas had to move funds from textbook budget allocations to technology budgets. The result of this is that many students are using books that are 10 years old.

Dickard (2002) states the economic downturn has reduced the pool of state, local, foundation and corporate resources for technology. She states the following:

Retrenchment of the public investments that catalyze smart, strategic public-private partnerships would curtail the progress made in bridging the divide. Therefore, continued federal leadership and support for technology access, training and innovations are critical if low-income and rural communities are to use information technology to break the cycle of economic and educational disadvantage. (p. 4)

Charp (2003) describes the status of state funding for district technology programs. Tight budgets, resulting from dysfunctional school funding processes, have caused schools nation-wide to have money problems. This lack of funding is hindering states' efforts for implementing technology plans. Many school districts, such as a high school in Mississippi, needed 275 computers to meet the state's classroom needs. Because of a lack of funding, a high school gave 100 students the responsibility for putting together the computers to save money. In New York City, schools have turned to students to help repair computer equipment.

**Section 3. The Impact of Technology on Business and the Educational Relationship. How has the Impact of Technology Affected Change in the Expectations of Business Leaders Regarding Technology Competencies and the Curricula for High School Students?**

Technologies, as viewed by Marken (2001) and the Internet have forced management as well as marketing and support people, to broaden their knowledge areas and workplace expectations. It has forced employees and management to cope in a rapidly changing environment of uncertainty. Businesses believe that this will provide new opportunities for communication and training on the job or in an educational setting. Businesses predict that technology will continue to eliminate old jobs and create new opportunities at a very rapid pace therefore, educational organizations will have to adjust their curriculum in order to avoid teaching skills that are or will be obsolete.

Businesses that participate with schools in work-based learning represent the integration of workplace experiences and career and technical education curriculum. Brown (2003) reports that when there is involvement with students there is a very comprehensive access to knowledge. Students are able to engage in workplace tasks that create a context for creative decision-making for uncertain situations. They also found that students are placed in reflective practices that help them develop both personally and professionally. In addition to workplace experiences, students experience workplace readiness or the development of work-related skills and knowledge that evolves from exposure to work. Students who immerse themselves into the workplace experience are able to make the difficult transition from school to

the workplace. Students become aware of the standards that employers expect and also, the experience leads the students to reflect on the in-school learning, therefore complimenting and reinforcing the learning standards in schools.

Denton, Davis, and Strader (2001) extend the technology movement to incorporate school reform and state and federal spending stating, “These resources have been invaluable in the increased availability of technology in the classroom and must be continued if students are to benefit from a digital advantage that is now required for the majority of the workforce” (p. 13).

The educational system is expected to develop a young, educated, and ready-to-work pool of employees who can perform technology related functions, even at entry-level positions. Students state however, that there is inadequate preparation to meet these expectations. Schools complain that they do not have the support or involvement of businesses, whereas businesses complain that our educational system is not preparing young people with the appropriate skills. Consequently, businesses must constantly make monetary contributions for training employees to qualify them for the type of expected work output (McGrath, 1998).

Crane et al. (2003) and the Board of the Partnership for the 21<sup>st</sup> Century state that our community, personal quality-of-life, economic viability, and business competitiveness for the 21<sup>st</sup> century will depend on a well-prepared citizenry and workforce. The Board is a unique organization of leaders and businesses that came together to help schools address the needs of the 21<sup>st</sup> century. They state that there remains a wide gap between the knowledge and skills most students learn in school and the skills they need in the workplace. They see technology as the tool to help

students learn to multi-task so that they may become better employees. The Board however, also states the importance that all students, regardless of economic status, have equal access to this technology. In order for this to happen, the Board concludes that schools must reach out to their communities, employers, and parents.

Rylander (2000) explains how technology is transforming the economy and generating new ways to do business locally, regionally, and globally. Geographic boundaries are becoming blurred as past-restricted economic development in isolated rural areas is reduced.

The question is whether economic situations and controls, which change rapidly, should drive our learning communities. Is there business participation in school curriculum necessary, or is it a way for businesses to prep students for future market profitability? McCandless (2003) cites Mark Sweeney, Senior Principal, McCallum Sweeney Consulting, of Greenville, SC, who stated:

There are still some industries that take high school graduates as employees (some plastics product segments, for example) and train them for the jobs at hand. But K-12 is important for a wider range of reason, and those perspectives will cross most industries. That said, in general, the higher the education requirement of the jobs in a company, the more important K-12 will be to that company since (a) it represents the quality of future employees, (b) the quality of education for children of employees is an important human resources issues, and (c) such companies and employees place a high value on education.

Honey, McMillan, and Carrigg (2000) state that sustained access to technology has the potential to have a positive impact on both a students' learning and on the

school community's view of their students' capabilities. The research moreover, shows that technology alone, in the absence of other school reforms, will not produce deep continuous growth. School administrators and teachers are faced with many questions about the expense of purchasing and implementing technology within school districts. The technology industry is changing so rapidly, making it even more difficult for schools. Despite the difficulties, it is imperative that students have access to current tools and information. With ever looming budget restraints, school boards and administrators experience a constant push-pull in the technology field.

If business expectations are that entry-level high school graduates have computer skills, we must have equal availability of technology. Every student in the school district must have the same access to technology, regardless of the location of the school districts. This not only includes the number or type of equipment, but also the type of instructional programs (Association of School Business Officials, 2001).

Equality also has several other applications in addition to equal accessibility. Student gender, minority status, and socioeconomic issues surface when dealing with technology. Strover (2000) explains that phone companies have few incentives to upgrade rural service to digital technologies because of poor economic conditions. Further, government policies exempt the companies from several regulatory obligations in exchange for providing telephone service to unprofitable low-population areas. This includes service to public schools that are located in low-population areas.

Many technology programs in schools have been successful; however, the Joint Venture's Workforce Forum Report (2003) identified several areas that remain weak

when students are exposed to technology experiences. Young women and minority students are in need of stronger direction in preparation for technology careers. It is necessary to make a greater commitment of resources for preparing young people for careers that include technology skills.

Joint Venture and A.T. Kearney (2003) released a report recommending that there be a greater collaboration between the business community and workplace preparedness programs. They also state that technology companies, schools and nonprofits and other service providers do not typically share information and other current programs; furthermore, there must be a greater commitment of resources for preparing young people for technology careers. They found that there is a lack of continuity in funding for technology programs in schools. Funding is short-term, fragmented, and inconsistent. Corporate volunteerism in the schools is weak and is not part of the company's internal culture or lacks buy-in from a key executive. Lastly, computer equipment in school is a key resource in providing technology experiences, is outdated and barely usable. Although many businesses donate equipment, schools do not have the resources needed to provide adequate support to maintain usage of the computers.

Thornburg (1999) discusses the collision of these two philosophies by stating, "Unless our thinking about education is transformed along with our continuing expansion of telematic technology into the classrooms, our technology investment will fail to live up to its potential" (p. 1). Historically, educational systems have been based on fixed time and variable learning. It separates those who learn quickly from those who do not. In the past we have not designed our educational system to meet

the needs of the children, rather we label children as slow learners and as Thornburg states, “relegate them to the scrap heap of society” (p. 4). The shift in philosophies is illustrated in the past by those who lacked the capacity to fit into the mold of schooling could still find gainful employment; however, this is fast diminishing. Life-long learning is more prevalent and low-tech jobs are either being outsourced to other countries or eliminated altogether.

Cullen (2001) states that we assume that availability of technology and the world of information is so beneficial that no citizen in the 21st century should be without access, especially in the developed countries. Cullen states:

Technology does not in itself solve social and economic discrepancies within societies, and at times can often exacerbate them. Massive growth in the use on ICTs in India, for example has had no impact at all on what has been described as the highest concentration of poverty in the world. New technologies do not always replace the old. They may co-exist and in doing so enhance the range of human experience without necessarily diminishing the experience of those who do not use and/or utilize them, preferring older technologies to achieve the same ends. (p. 2)

Oppenheimer (2003) explains that schools can be viewed as wonderful foundations for business development. The customers are trusting, impressionable, and enthusiastic. Follow-up sales are almost guaranteed as homes become a showcase for the new invention. Many see this as an opportunity for business to use and take advantage of teachers and classrooms. Oppenheimer explains that this very

enterprise, the business of learning, “has become another enterprise altogether—one that is often incompatible with proven traditions of learning” (p. xv).

#### **Section 4. Examination of the Competency Expectations and Technology Access in Higher and Lower Socioeconomic Geographical Areas. How Do Expectations and Competencies Change with Geographical Location?**

The National Center for Education Statistics (2001) found that among the group of children and adolescents who have Internet access at only one location, 52 percent of those families in poverty and 50% of those whose parents have not earned at least a high school credential do so at school.

Rylander (2000) explains how technology is transforming the economy and generating new ways to do business locally, regionally, and globally. Geographic boundaries are becoming increasingly blurred as the past-restricted economic development in isolated rural areas is reduced. It is a reality that school districts differ in their ability to raise sufficient local tax funds to meet every student’s technology and educational needs. Business expectations however, are not based on boundaries and property taxes; they are based on economic forces; therefore, when school districts do not have sufficient funds to purchase necessary hardware and software the students are at a disadvantage. Every district must provide basic technological needs for every student regardless of where they live. Technology, Oppenheimer (2003) explains, is redefining the continuing inequalities in our methods for teaching the rich and poor, toying with the requisites of the human

imagination and altering public hopes about school reform. Further Oppenheimer states:

It is recasting the relationships that schools strike with the business community, warping our beliefs about the demands of tomorrow's working world, and reframing our systems for researching, testing, and evaluating achievement, not only in individual students but across school systems. In the process, computers are also reshaping nearly everyone's sense of how people are strengthened by the tools we use (p. xv).

Hacker and Jan (2003) predict that gap for access to technology may close; however, differential access of skills and usage is likely to increase. Many people believe that the problem of information inequality and the use of digital technology or computer communication, can be solved at the moment someone has the ability to obtain a personal computer and a connection to the Internet. Additionally, many consider the mental barriers being only applicable to elderly people and the unemployed. When the problems of mental barriers and material access have been solved the problems of different structural skills and uses become more important. Much of the survey data that defines the digital divide is too unreliable and invalid, thus, conclusions cannot be drawn from the majority of data.

Many issues affect the use of computers, such as emotional factors and computer anxiety. Hacker and Jan (2003) reference longitudinal data, which constitute strong evidence of gaps in the possession of computer and network connections based on social categories such as income, education, occupation, age, gender, ethnicity, and geographical location. One factor that continues to widen the digital divide is that

technology is very different today than it was ten years ago. Growth rates for usage are enormous. Additionally, many people who would benefit from these resources do not feel skilled enough to choose the equipment for technology usage.

Another factor that affects the lower income families is that the equipment is outdated much faster than any other medium and requires continual updates, usually involving additional purchases. Further, many believe that the position of the disappearing digital divide is politically motivated by the wish to prevent government interference. Hacker and Jan (2003) emphasize that there is no question about an absolute, growing, and unbridgeable gap between two classes of people. They discuss “technical segregation” and “classical apartheid” as an extreme exaggeration that misses the point.

Giving everyone a computer and a network connection, banning the cutting lines of “segregation” in this way, will not remove the digital divide. Much deeper and more clear-cut differences in skill and usage will appear as both technology and society increasingly differentiate. (Hacker & Jan, 2003, p. 324)

Hacker and Jan (2003) summarize by stating that there are in fact several divides. They state that markets have done a good job at lowering prices for technologies, but these efforts have not prevented the growth of digital divides in the possession of technological hardware. More importantly, they cite that digital skills are learned more at work than at schools. General education runs behind because of insufficient means and teachers are not sufficiently trained or motivated.

Technological advancements have become an integral part of daily life. Issues of access are a concern as businesses respond to the new demands of changing

technology. African-Americans and Hispanics have shown to be behind other racial groups in their usage of the Internet. Lodree (2002) found that African-Americans and Hispanics, as a whole, have lower incomes and lower education levels than the national average. It is therefore, even more important that these students have access to technology in schools.

The integration of technology is difficult for teachers in urban areas where there is a high student population (Lodree, 2002). Teachers devote much of their time to managing student behavior such that monitoring and teaching the use of technology becomes an unwanted task. In low-income urban areas however, school may offer the only opportunity for the student to learn how to utilize and develop technology skills. Lodree (2002) describes the misbehavior of students has reframed the privilege of using computer stating, “It seems that many teachers view the computer as a reward for good behavior rather than an integral tool to support learning” (p. 7).

The digital divide is more than inaccessibility to technology, as described by Quay (2001). Today, it is using technology to improve one’s quality of life and four basic activities. These include: (1) getting connected to the Internet; (2) finding information related to a task or problem; (3) retrieving information; (4) using the information. Now, even with computer access, Internet sites are becoming so sophisticated that there is a need for high-speed connections for retrieval purposes. There is a significant cost for this service and again sets barriers for lower income families to have access. Rural areas remain isolated because it is not cost effective to service a handful of customers. Again, students who live in rural or low-income areas

have no chance of improving their chances for excelling and moving into another level of income.

Simons (2002) states the following about students and technology use in the classroom. He stated, "I'll get right to the point: When it comes to incorporating and using technology in the educational setting, particularly K-12 classrooms, America's public schools are a dismal failure" (p. 6). Further, he states that many schools are ill equipped to educate children and prepare them for the workplace.

Governments, industry, and philanthropic support programs give access to training in under-served communities for the sake of achieving the 21<sup>st</sup> century level of skills (Wilhelm, Carmen, Reynolds, Casey Foundation, & Benton Foundation, 2002). Unfortunately, there have been substantial federal cuts that will dramatically reduce the ability for the lower socioeconomic areas to have access to these programs, and thus will diminish the digital divide.

Wilhelm (2002) finds that finds that 84% of the low-income families are without a computer. Generally, children who are already disadvantaged are the least likely to have access to technology. Oppenheimer (2003), however, refutes the presence of a digital divide stating, "These delusions are the chronic campaigns to close what's come to be known as the "digital divide"—the shortage of technological gear that has supposedly cheated the poor out of social and economic opportunities" (p. xvii). In 1983, the digital "ghetto" included 25% of the nation's children and that two times as many rich schools had computers as compared to school with low income students. The 1990s were dedicated to "bridging" this divide. Lugene Finley (2001) (as cited in Oppenheimer, 2003), chief technology officer for the Illinois state board, regarding

technology that “it can be an equalizer when you provide the tools” (p. 55). Oppenheimer also explains that another delusion is that we have made desperate attempts to prepare students for the professional world of the future and the prevailing beliefs about technology’s role in these studies. Many dismiss questions about teaching practices and argue that despite its problems, computer experience is crucial for success in the high-tech workplace. Oppenheimer reflects on how “severely this line of reasoning misreads history, misunderstands the demands of the workplace, even the high-tech workplace-in short, and shortchanges students” (p. xix). Further, Oppenheimer explains that the world of work and modern society also require, “a richer inner life, strong values and work ethics, broad knowledge, the capacity to observe and think critically, a fertile and flexible imagination, and the art of discussion” (p. xix). Many of the educational trends have been moving our students in the opposite direction.

Cuban (2001) reports, “The reality is sobering: to a first-order approximation, the impact on computing technology over the past 25 years on primary and secondary education has been essentially zero.” He further states, “Although specific classrooms or even schools can be identified where computing technologies have had an impact, overall, looking across the landscape of schools in the United States, there are previous few lasting footprints” (p. 15).

Norris, Sullivan, and Poirot (2003) issued a snapshot survey in large and small districts around the country of approximately 4,000 K-12 classroom teachers. Overall, they found a significant and substantive correlation between technology access and use. The strongest predictors of teacher and student technology use were

measures of technology access. Contrary to conventional wisdom, teacher characteristics and demographics (time on the job, subject matter, gender) were of relatively little consequence in predicting teacher and student use. Norris et al. cite that the snapshot survey found that 1 teacher in 6 had no computers in his or her classroom and nearly two-thirds had no more than one computer to be shared among their entire classroom. Further, they state regarding access to technology and student learning:

It's true that classroom technology has not had a positive impact on teaching and learning, but it's equally true that lack of impact is overshadowed by a widespread lack of technology access. If students don't have access to classroom computers, then classroom computers can't possibly have a measurable impact on students' learning. (p. 25)

School professionals as explained by Kozleski (2004) need to find new ways of responding to these dilemmas. Not only do we need to shift what we teach, but we must also shift how we teach. The cultural, ethnic, and linguistic characteristics of our student population must inform us of ways that we construct our learning environments. Even if our curriculum responds to demands of the workplace, without shifting our methods of instruction, schools will fail to educate the increasing numbers of students.

Deaney, Ruthven, and Hennessy (2003) discuss the use of technology in schools. It can be intimidating for students because of varying skill levels. Many students go home and try things on their computers because they are in a comfortable environment with little to no pressure. "... Because not everyone is that same level.

Some people don't like playing with computers, they don't know what to do, they haven't got a clue, they're used to just writing in their book, where others are really good at it and have taken to it" (p. 148). Researchers found a great diversity of technical skills of the young people. While some picked up the technical knowledge at home or at school, others lacked the interest or opportunity to learn. All students in the study felt that they needed to expand their current skills to better prepare for future employment.

## **CHAPTER III**

### **METHODOLOGY**

#### **Introduction**

The primary purpose of this study was to examine and explore business and educational leaders' perceptions of necessary technology competencies of high school students in different socioeconomic and geographic areas in selected schools and businesses in San Antonio, Texas. Carter, McCarroll, and Popek (1998) found that high school students have insufficient employment skills and are unable to meet the demands of their employers. As technology proficiency requirements increase in the workplace schools and businesses expectations rise for only the segment of society that has the means for acquiring the necessary skills for future employment. Students entering into careers after leaving the public education system have become increasingly chaotic because of the growing gap between the capabilities of high school students and the skills and knowledge required by the employer.

I was particularly interested in this topic because I have taught in school districts at both ends of the continuum: both in higher and lower socioeconomic areas. Further, I taught at a magnet school in an affluent district in San Antonio Texas that had incredible business and community involvement. Businesses participated in mentoring programs, provided internships, and often participated with an advisory council that was responsible for the evaluation of curriculum. The businesses acted as an advocate for students to explore the boundaries of what was expected in the school environment. Under this model, the students flourished. Both the business people and the students developed life-long relationships. Students often acquired

internships that allowed them to gain high school credit while also gaining invaluable on-the-job training.

My other position was at a school located in a lower socioeconomic district. Businesses rarely communicated or became involved with the district because of their geographic location. The district was located in a rural area 15 miles from downtown San Antonio and was predominately Hispanic. The district struggled with low community involvement and lack of funding. Many of the teachers expected the students to follow the same pattern as their parents; thus, expectations were low. Overall, the parents' believed that graduating from high school was an adequate education because it was far more than what they had achieved as students in the public school system. Technology was scarce and when available, was only utilized by a few teachers and students. Students had little access to computers. The few labs available were essentially non-working. Funds for training teachers to use technology were unavailable which meant learning how to use computers functions was self-taught.

While having computers is one aspect of access, having the staff to maintain the system is another critical part of the technological success of students. Often staff would have to wait weeks for someone to resolve an equipment problem. For many teachers, it was more trouble than it was worth. Slow repairs meant technology was unavailable for students to use.

From my experience, both schools were dramatically different in their access to adequate technology for students and training programs for teachers and administrators. This motivated me to research districts within San Antonio, Texas

that were dramatically different both geographically and financially. My objective was to immerse myself by observing and listening to perceptions from teacher and business leaders as well as to explore technology competencies.

I feel that a great value can be derived from listening and talking with teachers and administrators. My goal was to learn, from the educators, an in-depth understanding of their beliefs that affect student competencies, innovation, and change. Educators are the day-to-day participants who understand and are familiar with the challenges and obstacles in the education system. In addition, I also give enormous credence to input from business leaders because the students are the future employers of our students. Often, because of the hierarchies within an organization, business leaders' voices go unheard altogether.

For both education and business leaders, I used pre-assembled questions and open-ended interviewing techniques.

### **Naturalistic Inquiry**

The research design utilized is that of basic qualitative naturalistic inquiry, which follow the characteristics described by Guba and Lincoln (1985).

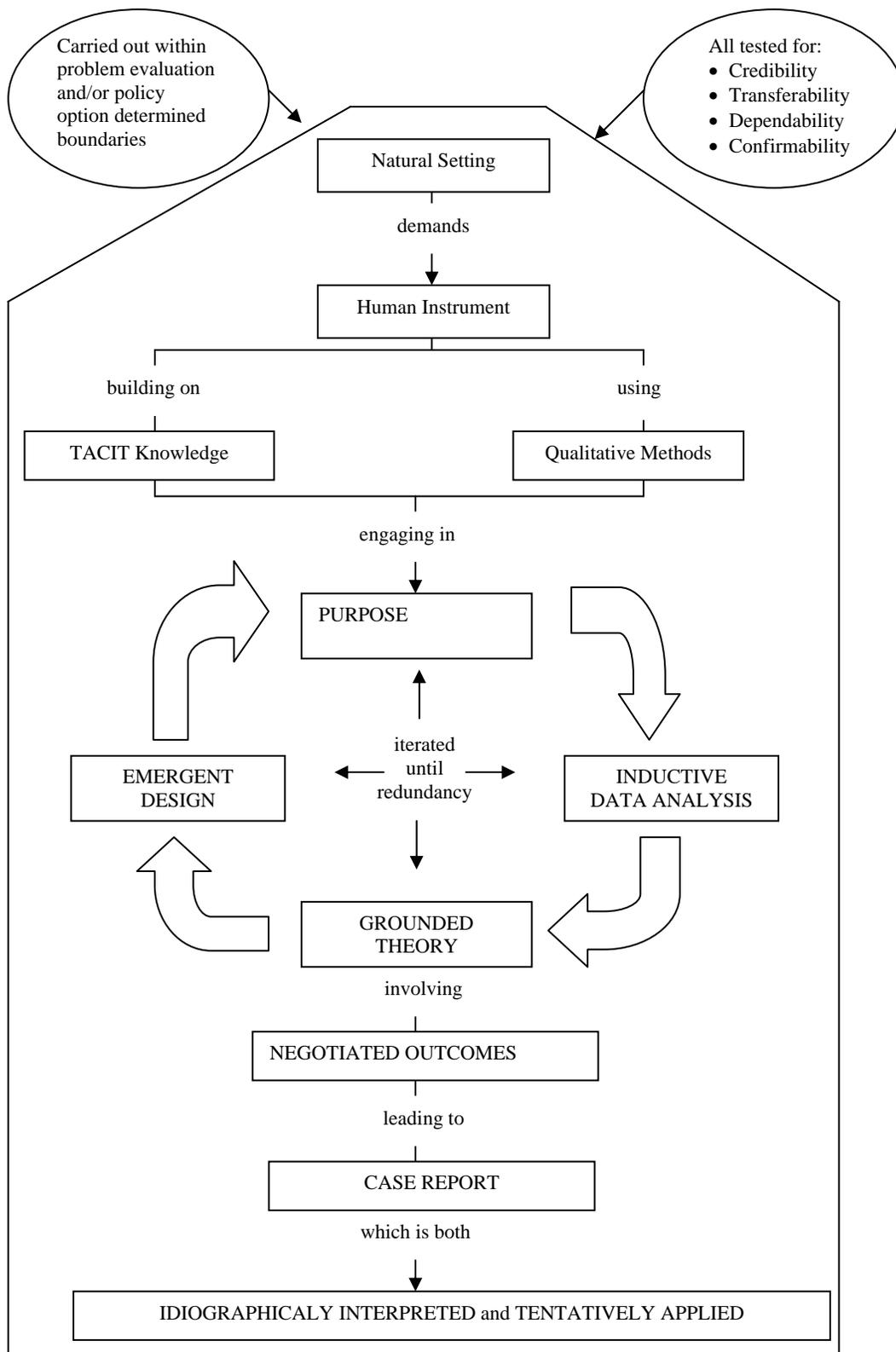
Qualitative research, or naturalistic inquiry, is “an inquiry process of understanding based on distinct methodological traditions of inquiry that explore a social or human problem. The researcher builds a complex holistic picture, analysis of words, reports with detailed views of informants, and conducts the study in a natural setting” (Creswell, 1998, p. 15). It’s purpose is to “understand human experience to reveal both the processes by which people construct meaning from their

worlds and to report what those meanings are” (Creswell, 1998, p. 14). Furthermore, qualitative research encourages researchers to recognize and value multiple ways of seeking knowledge/information. Listening and talking with teacher and business leaders in focused ways yields significant information (Cole & Knowles, 2000).

It was my intention to experience the multiple and diverse realities that would present themselves through location and areas of expertise. In short, the reality of the businessperson would be different than the reality of an educator. I was able to achieve this by using naturalistic inquiry while collecting my data and grounded a theory for data analysis. Erlandson, Harris, Skipper, and Allen (1993) state that natural inquiry is the

Design in a naturalist study takes great care to see that it is not imposed arbitrarily on the context and that it takes into consideration the full richness of the context. As a result, the design of a naturalist study is usually not fully established before the study begins but emerges as data is collected, preliminary analysis is conducted, and the context becomes more fully described. (p. 66)

Figure 1. is a diagram that was followed throughout the naturalist study (Guba & Lincoln, 1985, p. 188). Specifics of the methods are individually identified following the chart.



**FIGURE 1. Guba and Lincoln (1985) The Process of Naturalistic Inquiry**

Natural setting—Inquiry was carried out in a natural setting, meaning that it took place in the teachers’ and the business leaders’ work place. When I initially contacted them, I asked them to choose a setting where they would feel comfortable; however, I did feel it was important to see where they performed the work that I would be inquiring about during the face-to-face interview. This way, I could observe how they behaved in a comfortable setting rather than an unfamiliar environment. It should be noted that only I would be able to see how they might behave.

The human as instrument—I utilized the methods described by Lincoln and Guba (1985) to ensure that I would qualify as the instrument of choice for the naturalistic inquiry.

Responsiveness—To ensure there is a sense and response to all personal and environmental cues that exist. By doing this, there was a sense of obtaining a systemic view of the environment and the subject.

Adaptability—I was very cognizant of all the different situations and environments where information would be collected. I was willing to stay flexible, hand over control, and follow-up with more inquiry if the situation presented itself.

Holistic—I was responsible for organizing and classifying multiple levels of data.

Knowledge base expansion—I felt that I had an excellent base knowledge of the topic of inquiry. This quote by Guba and Lincoln (1985) guided my actions, “Extending awareness of a situation beyond mere propositional knowledge to the realm of the felt, to the silent sympathies, to the unconscious wishes, and to the daily

unexplained usages will lend to depth and richness to our understanding of social and organizational settings” (p. 194).

Processual immediacy—I was able to process data immediately, advance in the inquiry, and test hypotheses with subjects during the interview.

Opportunities for clarification and summarization—I was able to summarize data during the interview, paraphrase back to the person being interviewed, and ask for summarization for validation and/or correction.

Opportunity to explore atypical or idiosyncratic response—I explored these responses and was able to achieve a higher understanding of data.

Tacit Knowledge—Guba and Lincoln (1985) state:

Tacit knowledge is all that is remembered somehow, minus that which is remembered in the form of words, symbols, or other rhetorical forms. It is that which permits us to recognize faces, to comprehend metaphors, and to “know ourselves.” Tacit knowledge includes a multitude of inexpressible associations, which give rise to new meanings, new ideas, and new applications of the old. Polanyi recognized that each person, novice or expert, has great stores of tacit knowledge with which to build new understandings. (p. 196)

I was able to utilize my tacit knowledge to build on information, insights, and hypotheses.

Qualitative methods—Qualitative methods include extensions of human activities: looking, listening, speaking, and reading. I utilized these methods while observing nonverbal cues.

Purposeful sampling—Guba and Lincoln (1985) describe purposeful sampling as definition of a sample that is representative of a population it generalizes. My main objective was to include as much information as possible; therefore, a purposeful sampling was utilized throughout the study. Guba and Lincoln (1985) describe this in this way:

The criteria of theoretical sampling (variation sampling) are designed to be applied in the on-going joint collections and analysis of data associated with the generation of theory. Therefore, they are continually tailored to fit the data and are applied judiciously at the right point and moment in the analysis.

The analyst can continuously adjust his control of data collection to ensure the data's relevance to the impersonal criteria of his emerging theory. (p. 201)

In particular, I utilized (1) emergent sampling design because the sample could not be drawn in advance; (2) serial selection of sample units where subjects were discovered, new information was chosen, and as gaps needed to be addressed; (3) continuous adjustment or focusing of the sample was utilized as information accumulated and I was able to focus on subjects that would be most relevant; (4) selection to the point of redundancy was used to determine sample size. The size of my sample was determined by informational considerations. When information became redundant it became clear that my sample was appropriate.

Inductive data analysis—I did not work with a prior theory or variables, which allowed for theories to emerge during the study. I utilized the process of coding responses, wherein data is broken into units enabling relevant characteristics to be extracted. The data consisted of stand-alone pieces that can be interpreted on their

own. In many cases there were as paragraphs or sentences, as well as longer passages that were isolated. Data were then categorized and information was sorted into “categories” and linked with other characteristics.

Grounded theory defined by Guba & Lincoln (1985) is the theory that ensues, rather than precedes, data. Glaser and Strauss (1967) indicate that a grounded theory is one that will:

Fit the situation being researched, and work when put into use. By “fit” we mean that the categories must be readily (not forcibly) applicable to and indicated by the data under study; by “work” we mean that they must be meaningfully relevant to and be able to explain the behavior under study. (p. 261)

As a researcher and as someone who is very involved in education, I utilized the constructivist paradigm, meaning that everyone brings to the project individual experiences, perceptions, and in many instances, cultural meaning. The more dialogue presented, the more of a shared meaning will emerge. Denzin and Lincoln (2000) state that constructivism implies a hermeneutic research methodology.

During data collection, grounded theory was used to identify emerging themes and patterns in order to develop a systemic view of the data being presented. It was my goal to identify and discover linking characteristics shared or not shared by both the educational leaders and business leaders.

Charmaz (2000) describes the constructivist ground theory as being flexible and insightful. Within the process of utilizing ground theory I was able to look for parallels that might exist between participants. This allowed for me to organize the data, which would emerge through the analysis process. According to Denzin and

Lincoln (2000) the development of categories cannot be preconceived from the collection of the data.

Emergent design—Erlandson, Harris, Skipper, and Allen (1993) describe an emergent design as the researcher's recognition of the complexity of the human setting and his or her loyalty/faithfulness to the context. As I collected data, an emergent design surfaced while working on hypotheses. Although I had developed my questions prior to the interviews and collection of data, there was always an area in need of modification and elaboration.

Negotiated outcomes—Guba and Lincoln (1985) state that both facts and interpretations will ultimately find their way into the study. The researcher must negotiate between findings that are opposite or contradictory in nature. This is very important as these negotiations will be essential in truthfulness of the research. This is a continuous process that is both formal and informal from the beginning of the study.

The case report—"A case study as an intensive or complete examination of a facet, an issue, or perhaps the events of a geographic setting over time" (Guba & Lincoln, 1985, p. 214).

Idiographic interpretation—When conducting naturalist inquiry it is important to assign meaning only within a particular context at a particular time. Additionally, this type of research is dependent on elements within the site, including the ideals and values people have at the time of the interview. Guba and Lincoln (1985) describe data as being viewed in a very holistic way. Meaning cannot be derived from simply looking at the parts of a system; looking at the whole system adds meaning and will

yield knowledge. Schwartz and Ogilvy (1979) discuss the emergent dimension of perspective, arguing that even the accumulated wisdom of all possible disciplines cannot yield a complete picture of anything. Understanding can apply only to that context to which it was derived.

Tentative application—Researchers are not able to make any statements about transferability from the data collected within the context of the naturalistic research study. It was my desire to show what was occurring within the context of the population from the two groups of subjects and the multiple environments. Transferability can only be made by a person seeking to make the transfer.

### **Description of the Selected Population and Data Collection**

The population for this study included seven different business environments and four educational districts in San Antonio, Texas. I chose businesses from different sectors of the economy in San Antonio to gain a broad perspective of the research topic. I interviewed business leaders from: (1) grocery; (2) San Antonio city government; (3) the military; (4) a larger retail chain; (5) technology organization and business; (6) telecommunications; (7) youth-oriented organization.

Eligibility for participation of business leaders included the following: (a) length of service and job position, (b) type of business, (c) employment or exposure to students or education and, (d) located in San Antonio, Texas. My selection of the businesses was unbiased without other than surface prior knowledge of their business functions.

First, I contacted the businesses by telephone and explained my research topic, asking who might be available for an interview. Occasionally, I was given a referral to another business, given a name, or was put through to voice mail. Despite the detailed messages I left, often times there were no responses to my request. Since e-mail is a widely accepted communication device, I followed up with an e-mail. This was much more successful and served as an excellent way to connect with the business people. I did have several rejections because of the fear of negative publicity and the media. Even though I explained that I would not release their names, there was clearly a resistance to any type of research that would be conducted at their company.

Teachers and administrators were chosen from four different school districts in San Antonio—two from very affluent areas of San Antonio, Texas, and two from very poor socio-economic areas. A total of four or five administrators/teachers were interviewed in each of the four districts.

It was very difficult to gain permission to perform research in the affluent school districts. Both district offices required the submission of an unusual large volume of paperwork stating my research design, participants and confidentiality. One office requested the submission of a 25-page, handwritten document. They were adamant about “wanting to stay off the six o’clock news.” After approximately eight weeks, I was granted permission to contact the principals of the high schools. It was made very clear that if the principals did not agree to the interviewing process, the research could not take place. After numerous calls and e-mails, both district principals granted me permission, providing that they could arrange the interviews. After

gaining approval from the district offices and the principals to conduct research in the schools, the principals assigned random teachers to be interviewed. The principals however, did agree to follow my criteria for having a diverse group of teachers that taught at the junior or senior grade level. This way, the teachers would vary in discipline, gender, and grade level. The principals first asked the teachers to participate and then I contacted them through e-mail for further arrangements. The principals also consented to participate in the study. Every teacher and administrator contacted consented to an interview (see Appendix A).

For the economically disadvantaged schools, the paperwork approval was not necessary, but contacting the school was difficult. The superintendent from one of the districts did not respond to voice messages I left, or to numerous e-mails. Finally, I went to the school administration office to discuss with the superintendent what I was asking of the high school and participants. They finally agreed, but stated that it was contingent on whether the principal felt the research was appropriate. I promptly introduced myself to the principal and gained the support and approval contingent upon the fact that he/she would select the diverse group of participating teachers who would match my criteria (see Appendix B).

Teachers and administrators have often been overlooked in educational research (Britzman, 1989; Cochran-Smith & Lytle, 1990; Thomas, 1993). Qualitative research allows for subjects to validate their perceptions. My goal was to for people to openly discuss issues they perceived as obstacles or as constructive assistance. Through open and encouraging dialogue, teachers and administrators felt comfortable about disclosing information. Qualitative research accounts for examining multiple realities

among research subjects. These realities affect the belief and value systems of educators. Additionally, these realities construct filters that contribute to data and meaning, eventually shaping behavior. How educators interrupt their current reality directly influences the educational environment where teachers, educators, and students interact and learn.

### **Procedures**

I used personal, in-depth interviews for the collection of data for my study. In-depth interviews were conducted on-site, audio-taped, and then transcribed for analysis. My goal was to acquire a comprehensive understanding of the perceptions and thoughts of business, administrators, and teachers. Consequently, I chose to use open-ended interviews to allow subjects to expand their answers without boundaries (see Appendices C and D).

Since this was a structure that began with a thorough review of literature and collection of data, I anticipated the emergence of grounded theory principles. Questions and categories will be generated within the interviews. The results of these interviews will be compared and contrasted between business and education leaders.

### **Instrumentation**

The study was a critical educational ethnographic study. The importance of understanding the specific context of the cases being studied defined emerging patterns and themes from which constructs can be formed. The researcher facilitated

data collection, which allowed more natural, inductive analysis. Observations and interviews defined the scope of the analysis.

### **Data Analysis**

Throughout the study there was an ongoing interactive relationship between the data analysis and the data collection. Analysis began as the first data was collected and as subsequent collection of data were compiled. This was a naturalistic study therefore, the interview questions were open-ended. Questions were built around concepts such as the national standards in education and grounded in the notion of the influence of business on education.

### **Limitations**

The study was limited to data collected from business leaders in San Antonio, Texas who have employed high school students.

The study was limited to data collected from administrators and teachers in selected schools in San Antonio, Texas.

The generalizability of the study was only applicable to businesses and educators, such as administrators and teachers, in San Antonio, Texas.

The generalizability of the study was only applicable to high school students in San Antonio, Texas.

**Conclusion**

Using various qualitative, naturalistic inquiry methodologies, I was able to design a method that allowed me to create questions, create a research plan for collection of data, and analyze the data for a truthful representation of my research study.

## CHAPTER IV

### ANALYSIS OF DATA

Chapter IV is a review and analysis of the interviews with the 28 participants that were selected for this research. While interviewing my participants, I specifically focused on the following research questions: (1) To what extent do businesses in San Antonio, Texas contribute to technology competencies in selected schools in San Antonio, Texas; (2) To what extent do businesses influence high school technology curriculums in San Antonio, Texas, as perceived by teachers, administrators, and business leaders; (3) To what extent do business and school leaders' expectations of technology competencies of high school students in selected high schools decline because of lower socioeconomic conditions and geographic areas in San Antonio, Texas; (4) To what extent do administrators and teachers perceive the importance of technology competencies for selected high school students for future employment?

I have written a rich, thick description that addresses all of the research questions. All data were gathered person-to-person and collected from the interview questions. The interviews and observations during the interview sessions were the primary source of data collection. I interviewed administrators and teachers in all four schools. All the schools were from different districts within San Antonio, Texas. Schools were divided into groups with two distinct characteristics—economic status and population. I grouped selected schools X and Y and then compared them with other school grouping: schools A and B. I interviewed a total of 21 teachers and administrators. In addition, I interviewed seven types of businesses within San

Antonio derived from primary business categories such as grocery, technology, city government, youth-oriented, military, telemarketing, and retail.

### **Themes**

Analysis of the data identified the following themes which were utilized for coding and organizing data (an overview of patterns and variables identified in the study can be found in Appendix E).

- Access to technology at home and school by geographic location in San Antonio, Texas (digital divide)
- Teacher competencies and professional development opportunities
- Student learning and technology competencies for future success
- Demographical, socioeconomic and geographical differences in technology competencies in San Antonio, Texas
- Business and community participation in schools- technology competencies
- Expectations of business and teacher leaders regarding technology competencies

### **Introduction**

In the news, on the radio, in the newspaper, and in every element of our lives, we hear about how important it is to have technology as part of our daily lives. Many of these declarations guarantee that life will be easier, more satisfying, and most importantly, that we will gain economic prosperity upon the purchase of a computer.

Our children hear this message and believe it. They are drawn to it. It began with the game called Pong—back and forth like a tennis ball that was able to hold their attention hour after hour. With Pac Man, another electronic video game that absorbed American society, the addiction grew. It continues to mutate into extensive business applications and a deeply embedded technology force within our economy.

Technology is seen as a sole variable that will provide security and economic growth in jobs and other opportunities. Since technology is the key to the future, then success must lie in the education of our future workforce—the children who are being educated in our schools, both public and private, using technology to learn, demonstrating what they have learned, and producing a polished product. The employees must have the skills that employers are seeking.

It seems that the need to give students the technological capabilities necessary to survive in an increasingly hi-tech business world is sensible, rational, and logical; however, there are many problems. One of the most prevalent is in the area of equal access to technology use in all schools. Students cannot learn about technology unless they have a hands-on experience and continuous exposure that incorporates all the “new and improved” methodologies, which changes faster than the national deficit.

New schools are being built with the most current technology equipment. Much to the dismay of schools that experience budget cuts every year, they soon discover their investment in technology equipment, within a two-year period, is quickly outdated.

Older schools struggle because their infrastructure cannot support a heavy data exchange. The financial responsibilities of older schools are tremendous as they try, in earnest, to establish an education for the students that will enable them to be successful and economically stable citizens. More times than not, older schools are located in an established neighborhood that has little source for financing education through the property tax funding of public education.

Adding to the financial pressures on schools is the increased attention on standardized testing. Parents, educators, and students are feeling the pressure of standardized testing and the *No Child Left Behind* (NCLB) legislation. Students are tested in all core subject areas such as Mathematics, Social Studies, Science, English Language Arts with reading even at the lower grades. Failure to successfully pass the exams is followed by repercussions, which may include grade retention. The repercussions extend beyond students, as schools and districts could suffer organizational penalties, including the threat of losing critical federal funding if the district scores are too low.

In order for students to test successfully, teachers feel that they must ensure that the entire curriculum is covered and reviewed throughout the school year. Teachers are unsure of what will be tested and how it will be tested. Further, the pressure from testing does not inspire teachers to learn and implement anything beyond the dictated curriculum. Thus, in addition to increased work due to standardized testing, technology instruction could potentially take even more planning and implementation because students are typically at different skill levels.

The question is whether there is enough time to cover other aspects of education that are not being tested under the umbrella of NCLB. Technology is not tested, but it is trumpeted as being the most effective tool that will ensure successful learning and successful test taking. Many teachers believe that going outside the curriculum for anything is threatening to them, the students, and the school. In addition, teachers are also aware of being professionally evaluated by how the students perform on the tests. Teachers feel more secure when concentrating on material that may be tested, rather than how to design a lesson with technology.

State and district agencies spend \$209,927,509.07 on building an infrastructure (E-rate) (Texas Education Agency, 2004a). Another source of funding teacher training for integrating technology into the curriculum (NCLB) is a requirement of NCLB. Funds for both formula and competitive grants must spend 25% of the total grant funds on professional development. Texas received \$59,385,629 (Texas Education Agency, 2004b) for the competitive TARGET Grants (Technology Applications Readiness Grants for Empowering Texas students and teachers) and the formula grants in 2004. Twenty five percent of the total amount was spent on professional development to integrate technology into the curriculum by schools. Instead of strategic training in content areas, teachers learn how to use various software programs. Once schools and school districts have spent the time on training, however, the availability of labs for use of the computer programs is limited or nonexistent. In the lower socioeconomic areas, teachers explain that certain areas get priority, especially the areas that are tested. Many teachers also explain that even when they have laptops on carts, many can not use them because they are in another

building or their classes are held in portables. If their classes were to be held in portables, the possibility of rain, or simply the hazards of moving the equipment gave the teachers and students no access.

The main focus of my research is to explore how technology fits within the business world as it pertains to expected competencies for employees. Businesses continually complain about the huge amount of money they must pour into training skills, such as basic remediation skills in the workforce. Involvement of business in education is often prompted through altruistic reasons such as civic pride, boosterism, social conscience, and corporate guilt (Kleine & Webb, 1992). An important question is whether schools can adequately prepare students without businesses contributing to their educational development in the public school system. Can teachers adequately prepare students without the help and contributions of businesses and communities partners in achieving the necessary skills?

How much do businesses really participate in the development of what is being presented to the students? Outside of technology contributions, the business sector does not help with the development of the curriculum. Students need to understand why they are encouraged to learn a certain area of study; the understanding of relevance comes directly from educators.

Another objective of the research was to explore the technology gaps that exist between higher and lower socioeconomic areas and the prospect of access and presented opportunities to build competencies within the selected four schools.

## Introduction to Schools X and Y

Schools X and Y were grouped together because of demographic characteristics. Both schools were classified as low socioeconomic districts in south San Antonio, Texas. This classification was based on the following funding and economic factors.

Thirty-one percent of the people living in school X's district are at poverty the level. Similarly, school Y's district has 39% at the poverty level.

Local Education Authorities at X and Y schools, which have low-income (at poverty) families according to the 1999 census, are represented in Tables 1 and 2.

**TABLE 1. Local Education Authorities (LEAs) Having at Least 2500 or 27% Children from Low-Income Families (Based on 1999 Census Update Data)**

District Name	1999 Poverty	1999 Enrollment	Percent Poverty
School X	3250	9786	30.812
School Y	21661	61283	38.838

Source: Texas Education Agency (1999).

**TABLE 2. School X Population, Ethnicity, and Gender by Grade Level**

Grade Level	Student Count	Percent of Total	Ethnicity Statistics					
			Ethnicity	Student Count	Percent of Total	Gender Statistics		
Ninth Grade	518	30%	Ninth Grade African American	2	0.40%	Female	1	50%
				Male	1	50%		
			Ninth Grade Hispanic	508	98%	Female	231	45%
						Male	277	55%
			Ninth Grade Native American	0	0.00%	Female	0	.
						Male	0	.

TABLE 2. Continued

Grade Level	Student Count	Percent of Total	Ethnicity Statistics			
			Ethnicity	Student Count	Percent of Total	Gender Statistics
Ninth Grade	518	30%				
			Ninth Grade Asian/Pacific Islander	0	0.00%	Female
						Male
			Ninth Grade White	8	1.50%	Female 3 38%
						Male 5 63%

Out of a total of 1,725 students, 518 are Ninth Grade, constituting 30% of the student body.

Grade Level	Student Count	Percent of Total	Ethnicity Statistics			
			Ethnicity	Student Count	Percent of Total	Gender Statistics
Sophomore Year	491	28%				
			Sophomore Year African American	1	0.20%	Female 0 0.00%
						Male 1 100%
			Sophomore Year Hispanic	484	99%	Female 224 46%
						Male 260 54%
			Sophomore Year Native American	0	0.00%	Female 0 .
						Male 0 .
			Sophomore Year Asian/Pacific Islander	0	0.00%	Female 0 .
						Male 0 .
			Sophomore Year White	6	1.20%	Female 2 33%
						Male 4 67%

Out of a total of 1,725 students, 491 are Sophomore Year, constituting 28% of the student body.

TABLE 2. Continued

Grade Level	Student Count	Percent of Total	Ethnicity Statistics					
			Ethnicity	Student Count	Percent of Total	Gender Statistics		
Junior Year	395	23%						
			Junior Year African American	2	0.50%	Female	1	50%
						Male	1	50%
			Junior Year Hispanic	390	99%	Female	181	46%
						Male	209	54%
			Junior Year Native American	0	0.00%	Female	0	.
						Male	0	.
			Junior Year Asian/Pacific Islander	2	0.50%	Female	1	50%
			Junior Year White	1	0.30%	Female	0	0.00%
						Male	1	100%

Out of a total of 1,725 students, 395 are Junior Year, constituting 23% of the student body.

Grade Level	Student Count	Percent of Total	Ethnicity Statistics					
			Ethnicity	Student Count	Percent of Total	Gender Statistics		
Senior Year	321	19%						
			Senior Year African American	3	0.90%	Female	2	67%
						Male	1	33%
			Senior Year Hispanic	312	97%	Female	168	54%
						Male	144	46%
			Senior Year Native American	0	0.00%	Female	0	.
						Male	0	.
			Senior Year Asian/Pacific Islander	0	0.00%	Female	0	.
						Male	0	.

TABLE 2. Continued

Grade Level	Student Count	Percent of Total	Ethnicity Statistics				
			Ethnicity	Student Count	Percent of Total	Gender Statistics	
Senior Year	321	19%					
			Senior Year White	6	1.90%	Female	2 33%
						Male	4 67%
Out of a total of 1,725 students, 321 are Senior Year, constituting 19% of the student body.							

Source: Texas Education Agency (2004c).

### School X

The teachers and administrators from school X were very willing to talk to me even though it was the end of the year for the students, administrators, and teachers. There was an obvious sense of urgency in getting the day started and the week over with, along with the expectation of time off and a much needed rest over the summer. In some ways, I believe that my presence during the interview gave the teachers and administrators an opportunity to reflect and talk with someone about their successes and failures throughout the school year.

School X was old and needed to be innovated and updated. Paint was either stained or coming off the walls. Dirt had hardened in the corners from careless mopping. The water fountain was not working correctly and had a pungent odor because of corroded pipes. I was startled when I visited the teacher's lounge where there was an overwhelming smell of mildew and old furniture. The leather couch, where I interviewed a few of the teachers, was split and cracked with dirty puffs of cotton filling coming through the cushions. The lighting was dull, uninviting, and

dreary. The teachers seemed to blend in perfectly with the environment. They talked about being tired, unsupported, overworked, and unappreciated. The majority of the classrooms were in a similar state as in the teacher's lounge. The rooms needed to be sanded and painted to remove or hide the stains of dirt on the wall.

While at school X, I interviewed four teachers and one administrator with a very wide range of ages and experience. Two of the four teachers volunteered the fact that they were ready to retire and begin a new life. The interview served as a type of exit interview as they finished their last week and ended a teaching mission of over 20 years. The other two teachers were experienced, but had been teaching for less than 10 years. Two of the teachers had come to school X after working in other districts, but had stayed because they believed that the students needed them.

All of the school X teachers and administrators understood the importance of technology applications and skills that are required of employees in the workplace. They felt strongly about being geographically isolated from many factors of society because of their location. The school is located about 15 miles outside of San Antonio in an older and rural environment. The teachers described their concern about the welfare of students and their future successes. They described society and the business world as an entity that neither pays attention to them nor values what they or their students are doing in the schools. The teachers and the administrator summarized that they believe that businesses may choose not to participate or become involved with students and their needed competencies in technology or other areas of learning because it is inconvenient for them to commute outside of their work area or

area in which they live. One teacher stated, “They forget where they got the tools for their success.”

The administrator and teachers openly expressed resentment towards people they call the “do-gooders” that come into the schools occasionally from the business sector, make an impressive splash, and then disappear. They specifically referred to business people who had graduated from their school and felt obligated to come back and make a speech about how they were able to be successful inferring that this could also happen to any student no matter what circumstances face them. The business person who benefits from this experience is seen by the teachers and administrators as someone who is on an “ego trip” because they truly believe that if they make only one appearance, they will motivate students to stay in school and study for their math test. For every teacher and administrator interviewed, this was not contributing to competencies of any kind. The administrator expressed further, “If business people would come in and show students how technology is used in the business world, it would help support what we tell the students.”

When asked about partnerships, all the teachers and the administrator expressed a sincere need for community, especially business support, but had given up hope. The teachers did not understand why the schools were not viewed as a positive place for the community; a place where people could go and contribute and grow “Like a church,” a teacher expressed. “A place where they could see their futures and the futures of their children. Why could people not see schools as a hope and opportunity for peace and a better society? Instead, we offer a holding tank for students.” The teachers clearly understood that students need technology competencies. The

teachers expressed a need for other competencies such as business ethics and workplace responsibilities, all of which are insights that business people could contribute.

The administrator from school X explained that schools are looking for and require long-term and consistent involvement. “This will be a huge benefit for the community as students graduate and choose to stay and contribute to the community that was personally involved in their upbringing. This is the only way that there can be a contribution towards competencies that the students will need as they move toward citizenship.” A teacher went on to say that, “If technology access is considered to be the key for providing competencies to be successful in a competitive world market place, these students will not be prepared to compete.”

Two of the four teachers (50%) said that even if they did have adequate technology, which they didn't, many teachers would not know how to use it. They explained that the state and the district spends millions of dollars on textbooks that come with many different computer programs however, the computers they have are unable to run the programs because their computers are so outdated.

The technology at the school is described by two of the four (50%) teachers at school X as being obsolete. Yet, despite being completely wired for the Internet last year, one teacher said that, “We are still about 10 years behind other school districts in San Antonio. We were able to build our two computer labs for 3,000 students with a grant however, federal and state money has diminished.” Even though they had two mobile labs, teachers criticized that the labs are simply being used as word processors. Another situation is that some teachers act on their own and write grants

in order to receive the computers and related peripherals. One teacher expressed that teachers at their school feel left out because they did not know how to write grants and really did not have time if they did. As a result, they are forced to work with 8-year old computers. More importantly, the students do not have access to adequate technology.

A Social Studies teacher expressed concern because other content areas were receiving priority for using the computer labs. Many times English programs are loaded on all the computers in a lab and because of the investment in the licensing of the software. Other content areas do not have the opportunity to use the facility. Because of this, students often go room to room looking for a teacher who will let them use a computer or printer. An English department head teacher said that they hesitate to let students print because the ink cartridges are so hard to come by. “If I let the students use the printer, I will not be able to print anything out because if you let one student use the computer than you can’t say no to others.”

This occurred many times. While I was interviewing a teacher, a student would come in and ask for something from the teacher. They asked because they knew they could get what they needed. The teacher’s response to the student was always in a very caring yet firm manner, asking specifically what class they were printing the document for and why the library was not available. The library was described by the teachers as being very limited with only a few computers and printer which meant that students would have to wait to use the equipment.

One teacher from school X explained, “Students need structure and consistency, so besides teaching them a content area, I teach them how to shape their world

through organizing and reorganizing through technology use. This gives the students a sense of our being dependable; something they don't get at home anymore." The teacher went on to say, "The competencies that the businesses need should come from them." The teacher explained that even though they had no contact with business, they felt that they still had to stay aware of the demands that are being made on students as they graduate and enter the business world or go on to college.

One hundred percent of the teachers interviewed felt an enormous amount of pressure from administrators at the district level to use computers. A teacher stated, "They [administrators] say to use technology with the students. I only have one computer in my classroom, and what am I supposed to do with it?" One teacher at school X expressed how much students and teachers wanted to use computers, but the only computer available in their classroom was broken. Many times teachers attempt to repair computers by piecing electronic hardware together, but fail almost immediately. The teacher felt unable to reach the students because of their desire to use computers. Two of the four (50%) teachers explained that they finally received a computer program that they had been asking for over a period of two years. The program was installed, but failed last month. "No one is able to fix it, so the equipment sits and collects dust." They expressed that the students are sent the wrong message; no one cares enough about their education to give them the tools to help them. Conversely, teachers receive the message they are not valued by society enough to give them the tools to teach the students the skills they need. Often taken aback by the lack of planning, a teacher explained, "Even if we had computers and technology all over the place, we would not have the staff to make sure that it stayed

functional.” Even when resources are provided, if the system is not adequately maintained or developed, the use of technology cannot progress. For example, a reading teacher at school X found an amazing reading program that students found engaging. The program contained video clips and an oral reader that encouraged students to read along with individual headphones and microphones. After a short time, chronic system problems began. The manufacturer of the software claimed it was the school’s internal network problem and the school says it is the manufacturer’s problem. Ultimately, because the two sides could not agree, the students no longer had access to a beneficial learning tool they enjoyed. The teacher spent \$1,000 of her personal funds to buy textbooks that the students would accept.

In addition, the teacher purchased a printer, with personal funds, to print tests. The printer is necessary because students who are able to take a reading test often have to wait for constructive feedback and administrators cannot see their test results unless the results were printed. “I cannot afford to keep buying printing cartridges for projects, so it just sits without being used.” A teacher at school X explained that the library is always an option, however; one must sign up far in advance. One teacher explained, “Even if I try to sign up, the time I need is never available.”

Partnerships between schools and businesses, if utilized correctly, help students attain more skills and enable them to experience business practices while attending public schools. Businesses must also benefit from their relationships with schools in order to justify the investment of time and money into education. These benefits include: (a) financial benefits, (b) services and opportunities for students, and (c) curriculum development. Schools are more interested in ongoing support that will

help students by exposure to work environments and the tools, such as technology that are used in the workplace. Business involvement in core-curriculum classes (English, math, social studies) would provide meaningful, work-based learning experiences.

Support from community and business is often short-lived or nonexistent. “It is rare for us to get any kind of recognition,” says an experienced, longtime school X teacher. “Support is sporadic and short-term.” One hundred percent of the teachers and administrators summarized that business people and community members do not recognize the value of what they have to offer. Furthermore, the elementary schools receive all the attention, but by middle school and high school, the support dissipates. This is where the students need the support the most and in a different way. They need mentors and role models from multiple areas, such as businesses, so they can see what good choices can offer them. A teacher from school X said, “So now add ignored to isolated. For students that is a recipe for disaster.”

Those students from school X who participate in business classes do have access to business software applications in the classroom. In some of these cases, there was a history of involvement from businesses and the teacher was able to carry the involvement forward to a deeper relationship. The core content areas, however, do not have any business involvement, such as advisory councils, and do not have involvement from businesses to help mold the curriculum for a real world applications.

A teacher in school X described technology businesses as vendors. Teachers described the difference between providing the opportunities for purchasing and the

concept of partnerships. “We really do not have any partnerships.” This results in a program that is built on a school model instead of a business model. An administrator from school X said that they “never have technology companies coordinate anything with us—no businesses at all—I guess they don’t think it is worth their investment.” The administrator and the teachers, however, said that they would welcome business support, but it would have to be a long-term commitment. “A business person can not just come in one time and talk with the students and expect that there is going to be a difference.” With a long pause they finished by saying, “Sometimes I think that it [their one time visit] is so they can justify their existence rather than really contribute to the schools.”

Even with federal and state assistance, there still remains a clear difference between schools that are located in affluent areas and less-advantaged areas. Unless families relocate, lower socioeconomic areas where funding is an ongoing issue, will position students in a struggle for a quality education from the beginning of their educational experience. One teacher from school X explained, “I have taught in schools north of here and I can not believe the technology opportunities that are given to the students. I find myself hoping that our students never see those differences. I don’t think they would feel good about themselves and probably would lose hope for a secure future.”

While students in the lower socioeconomic schools have limited access to sophisticated software programs, it is further limited to certain classes. For example, in a technology class at school X, the students learn to use AutoCAD, which is used heavily by engineering companies, but a teacher explained how the students do not

actually learn how use in the real world. Interaction with business was nonexistent; likewise, this is also apparent when the students learn about other software programs and applications. The software is learned but not integrated into any content area so they would have a chance to practice. Learning the software functions is the priority in the technology classes. A teacher explained, “If the students do not go on to secure employment where these programs are used, the exposure to the tool is not maximized. The software program skills are soon forgotten as exposure is less frequent for the user.”

Interestingly, every teacher and the administrator (100%) in school X expressed feelings of being isolated from other schools within San Antonio. Neither businesses nor community members participated in programs or functions within the school. One veteran teacher sarcastically expressed that they felt their successes were measured by whether they could stay off of the six o'clock news. The teachers explained the consequences of being a “low profile” school. Students were not included in activities outside of their imposed imaginary barriers; therefore, teachers felt that they were on their own without support from the very people that would eventually benefit from their committed involvement. A teacher explained that many students, even in the high school, have never visited downtown San Antonio. Another teacher from school X expressed that those cities, such as San Antonio, work diligently toward attracting new businesses by highlighting winner schools and amenities of the city. “They go to great lengths not to discuss areas that may be considered marginal or a business risk.”

Seventy-five percent of the teachers, when asked about geographical differences, expressed that they felt people looked down on them because they were from the southern part of San Antonio. Explained by a veteran teacher, “When I go to workshops where teachers come from all over the city and teachers tell where they are teaching, I feel an instant prejudice about where I teach. I am a good teacher, but because of where I am from, I am disgusting. If I feel this way, how would students feel?” Another teacher from school X said, “We are not exactly a draw for businesses.” They went on to say that many people were shocked when Toyota decided to locate in San Antonio; however, they did not feel it would change anything for them or their students.

Further problems occur when teachers are not ready or trained to use computer technology in the classroom. When they do not have adequate skills, there must be a concerted effort to make sure this is resolved. Teachers must have easy access to resources in order to help students. How proficient students are in utilizing technology resources is dependent on how proficient teachers are in using technology. Two of the four teachers in school X expressed that during training they could not keep up. They did not have enough exposure and use to understand the level of training. Because of this they are reluctant to work on computers. Another teacher explained that they were hired because of their knowledge of computers. The only problem was that when they got to the school where they were going to teach, no computers were operational.

Training for school X is being offered although limited to teachers through the district office. Some teachers participate in varying programs outside of the school

district, such as one described by a teacher who participated in training held at the University of Texas in Austin. While the training was very beneficial for the teacher, upon return, the skills learned could not be used because the training computers were Apple computers, whereas the school computers were PCs. The teacher said that it made little difference what platform their school used because their PC and/or Apple computers would have been outdated. They felt that it was a waste of time to get excited about what could be offered to students. After the training they were met with the reality that they could not offer anything new to students. An administrator talked about the way the district is approaching training in technology. “Oh yes, they are putting it out there but it is a scattered approach.” The administrator goes on to say that the Texas Essential Knowledge and Skills (TEKS) in the area of technology are buried within the contents. Teachers are not able to see the connection between content, TEKS, and technology application. Even more importantly, they note that schools may have technology, but teachers are not using it. “I believe they are not using it because over the last couple of years there have been swift changes in leadership in many of the schools which have created an atmosphere of inconsistency and resistance.” The overall discussion, however, was that the district is doing the best it can because of the budget cuts endured over the last couple of years. The administrator made an emphasis on the prospect of support and as budget cuts happen, there was less support. The administrator said, “Sometimes we don’t even support each other in this school.” With shrugged shoulders the administrator explained that they do not have the money for training or to invest in the equipment. They added, “Many of the trainings that the teachers would receive in and outside the

district would be worthless because we don't have the computers or the programs for the teachers or the students." Seventy-five percent of the teachers expressed that they did not get the support they needed for any kind of training or growth professionally.

An administrator expressed concerns about the future of students and available avenues for them to take after graduation. Sometimes the administrator said, "It seems that society has set them up to fail, and all we do the entire time they are here is to try and undo that perception. Sometimes successfully, sometimes not." They also felt that with some kind of interaction with businesses, it could help with the future of the students and their hope of future employment.

A problem that research has identified as being potentially detrimental to the learning of content area when using technology is that students become so involved in the production and the glamour of the computer software they forget about the subject matter. An English teacher at school X explained that they get around this downfall by making sure that whatever computer oriented project they assign, students must be able to write an essay and practice their writing skills because their future employer will require and value these types of skills. When asked how this would be accomplished in a classroom that only had one computer, the response was a shrug of the shoulders and said, "The way teachers always do it. They bring their own materials from home and allow students to use them. In many cases, the students use the computers more than the teachers." One example that was given was, "A grading program is about it for computer use, and that is only because we have to use it to enter grades."

Through my research, I have found that there is a continuing misunderstanding and lack of knowledge about how to integrate technology across the curriculum. An English teacher expressed that, “as far as supporting technology for the English curriculum as being important—not here—it is not supported. For example, there is a reading program that is excellent, and the students learn and get excited about reading, but the class must go to the lab so that the entire class can participate.” Labs are scarce, but are in demand. Teachers expressed a desire to use a lab for research and WebQuests, but do not have access to labs. When they work with computers in their classroom it is on “scavenged material.” In addition, teachers expressed a feeling of “being on our own.” For example, if they were able to network the computers, not all computers would be configured. Even the software that is provided with the textbooks goes by the wayside because the computers are too slow or outdated to run the programs. A teacher expressed, “We spend millions on textbooks, sometimes because of the ancillaries, and then our district can’t even use them.”

A teacher from school X explained that even if opportunities for technology use did exist, they question whether their students would take advantage of them. They noted that some students are not cognitively able to see the value of learning and for acquiring a quality education.

They hear over and over again that if you try you can do anything. Because of their environment at home and at school, it is difficult for the students to believe that is true. By high school, the students have already made decisions about school and what they are going to do in their studies ... or not do. Even if the

students get to college, they probably will not be able to succeed because they will be so far behind the learning curve. Not only will they be academically and financially challenged but technologically behind the other college students.

They feel that their students do not have a chance in college or in a highly technical job.

The need for an equalization of the allocation of funds for technological educational aids is widespread. As a reading teacher from school X explained, their department teaches remedial reading to students that are classified as illiterate. The teacher explained that the students are extremely audible and many times read along with a computer program. They believe that this is the key to their learning because of the exposure students have outside of school; however, they feel responsible for providing them with opportunities to grow and learn how to read. The teachers believed that “the students will not survive” without it. They said that everyday they get a feeling of fear for the students and the possible obstacles that they will have to face especially if they do not have the skills to succeed.

### **School Y**

The demographics of school Y is shown in Table 3 below. It is evident that the school is minority based with some other ethnicities. The population of the school is also shown below.

**TABLE 3. School Y Population, Ethnicity, and Gender by Grade Level**

Grade Level	Student Count	Percent of Total	Ethnicity Statistics					
			Ethnicity	Student Count	Percent of Total	Gender Statistics		
Ninth Grade	545	29%						
			Ninth Grade African American	33	6.10%	Female	12	36%
						Male	21	64%
			Ninth Grade Hispanic	496	91%	Female	258	52%
						Male	238	48%
			Ninth Grade Native American	0	0.00%	Female	0	.
						Male	0	.
			Ninth Grade Asian/Pacific Islander	1	0.20%	Female	0	.
						Male	1	100%
			Ninth Grade White	15	2.80%	Female	5	33%
						Male	10	67%
			Out of a total of 1, 854 students 545 are Ninth Grade, constituting 29% of the student body.					
Sophomore Year	472	25%						
			Sophomore Year African American	26	5.50%	Female	11	42%
						Male	15	58%
			Sophomore Year Hispanic	430	91%	Female	230	53%
						Male	200	47%

TABLE 3. Continued

Grade Level	Student Count	Percent of Total	Ethnicity Statistics					
			Ethnicity	Student Count	Percent of Total	Gender Statistics		
Sophomore Year	472	25%	Sophomore Year	0	0.00%	Female	0	.
			Native American			Male	0	.
			Sophomore Year	2	0.40%	Female	1	50%
			Asian/Pacific Islander			Male	1	50%
			Sophomore Year	14	3.00%	Female	6	43%
			White			Male	8	57%
Out of a total of 1,854 students, 472 are Sophomore Year, constituting 25% of the student body.								
Junior Year	440	24%	Ethnicity	Student Count	Percent of Total	Gender Statistics		
			Junior Year	10	2.30%	Female	3	30%
			African American			Male	7	70%
			Junior Year	413	94%	Female	204	49%
			Hispanic			Male	209	51%
Junior Year	0	0.00%	Female	0	.			
			Native American			Male	0	.
Junior Year	2	0.50%	Female	0	.			
			Asian/Pacific Islander			Male	2	100%

TABLE 3. Continued

Grade Level	Student Count	Percent of Total	Ethnicity Statistics			
			Ethnicity	Student Count	Percent of Total	Gender Statistics
Junior Year White	15	3.40%	Female	6	40%	
			Male	9	60%	
Out of a total of 1,854 students, 440 are Junior Year, constituting 24% of the student body.						
Senior Year	397	21%	Ethnicity	Student Count	Percent of Total	Gender Statistics
			Senior Year African American	23	5.80%	Female 10 43%
Senior Year Hispanic	359	90%	Female	185	52%	
			Male	174	48%	
Senior Year Native American	0	0.00%	Female	0	.	
			Male	0	.	
Senior Year Asian/Pacific Islander	0	0.00%	Female	0	.	
			Male	0	.	
Senior Year White	15	3.80%	Female	8	53%	
			Male	7	47%	
Out of a total of 1,854 students, 397 are Senior Year, constituting 21% of the student body.						

Source: Texas Education Agency (2004c).

School Y's district area has a poverty level of 39% which classifies it as a lower-socioeconomic area. In comparison to school X, school Y was larger, but still an older school. The school was very well kept, yet had signs of age, such as cracked walls and lockers that were worn. The floors were clean, and there was not a bit of

trash anywhere. The large size of the school building did not compensate for the space problem at this school. The class size was approximately 30-35 students with multiple portable buildings in the back.

I was instantly struck by the difference in the behavior of the students. They were laughing and talking as they moved down the hall in a thick stream of students moving along to class. I heard a few typical curse words as they were deciding whether to go to class or not. A teacher and administrator expressed to me that many kids left school as soon as their parents dropped them off in front of the school. These were students going through high school not realizing that this experience would, in so many ways, determine their direction and focus for a very long time.

For schools X and Y, distance from the center of San Antonio was detrimental to business exposure. School Y was more difficult to find and was in an older part of town. Only service-oriented businesses were located in the area such as food services and a few department stores. A teacher from school Y explained, "The problem is that we are so isolated out here and no one wants to come all the way out here so they don't."

Every teacher and administrator (100%) discussed the students and their concerns about opportunities these students may or may not have in the future. An administrator from school Y talked about their concerns relating to discipline and dropouts; teachers are primarily concerned about the students and their futures. The teachers feel this pressure and also the pressure of the administration and standardized testing. A teacher from school Y stated:

Personally, me and a lot of teachers are unhappy. We are extremely unhappy. We get no support for behavior problems from the principal or our vice principal. It's a joke. The students roam the hallways and you tell them to get to class and they, you know, ignore you. On top of that, we do not have the resources we need to teach effectively. If the teachers do not have access to technology, neither will the students and they will not be able to acquire the needed competencies.

This same teacher explained that \$1,000 of their personal funds were used to buy a printer to print pictures from the Internet so students could relate in a different learning style rather than relying solely on an outdated textbook. One hundred percent of the teachers felt that they did not have the resources they needed to teach, and there was little support from the business or community area. When asked why, "It is a commitment that many people do not feel they can make. It takes time, patience and dedication and many people do not have the time."

School Y has a central goal regarding business participation in the schools. They have a system for organizing business participation however, it is only demonstrated in one particular class. The Distributive Education Clubs of America (DECA) department is an easy fit for businesses to incorporate their involvement. It is important to note however, that the teacher I interviewed was truly motivated and had a tremendous sense of urgency and support for involving the business community. The teacher understood and expressed support from their professional organizations where the purpose was to involve business in education therefore, involving more students. This teacher in particular, actually conducts research to explore what the needs are in the business sector and then brings those needs into the classroom to

offer solutions to the business people. The teacher stated, “In some cases it may be that businesses don’t contribute because they really do not know what the schools need and do not know how to go about finding out.” For example, the DECA instructor belongs to sales and marketing group within the city as well as a countrywide marketing coordinators group, which has a board of partnerships that consists of 10 different local businesses in San Antonio. The instructor actually leads the initiative for the purpose of building an alliance with the business sector.

It is important to note that the DECA teacher has exposure to business people because he/she is a member of their own professional (not supported through the school) organization. The instructor actively seeks business involvement rather than the business seeking school involvement. The DECA instructor explained how they formed a partnership with business.

I arrange for the students to sometimes volunteer at their place of business and then the business communicates areas of improvement to me. It is then that I feel confident about incorporating specific need areas into the classroom whether it is public relations or whether it is customer service, overcoming objections, social skills, or team work skills.

The teacher is the initiator for this and applies the necessary pressure to leverage change and partnerships within the school. “Anything the employer tells me in their evaluation, I come back and set up a unit to accommodate them.” They gave another example for involving students who have artistic abilities. The teacher goes out into the community and finds artists who are practicing their craft. By expanding this concept to other content areas, more support can be offered for every aspect of the

curriculum. They said, “The art teacher works with me, and we maintain an ongoing and long-term relationships with local and regional artists as well.” This makes a tremendous impact on the students because they learn more than just technology applications. They learn responsibility and, ultimately, the importance of a high school education.

Another example of business participation at school Y is the Health Occupations Students of American (HOSA) program for health occupations. The business teacher expressed, “We don’t have a health career program as wonderful as on the north side, but what we do have works extremely well.” Once the students actually begin the program, they finish rigorous training and then go out to a cooperating hospital and at the end of three years they receive a certificate so they can become and work as a nurse’s assistant as soon as they graduate from high school. In addition, the students are trained in hotel and restaurant management and work as assistants in the field. “There are several levels of vocational connections at our school.” The teacher also stated that the businesses they work with demand a high level of technology skills even in low level entry jobs. “They will not even consider someone who is not familiar with Microsoft Office. They have no time or desire to provide training. Businesses depend on the schools to train the students in technology so they are ready for the workplace.”

There is a large gap however, between businesses’ involvement throughout school X and specific programs (DECA and HOSA) at school Y. Subject area teachers were not experiencing the same involvement as the DECA and HOSA classes. A social studies teacher explained, “I never have had any connections with business. I think

they figure that since I only teach a content area, their interaction is not important. I guess businesses don't see the big picture and how skills are skills." This was reiterated throughout the interviews. All teachers and administrators included in this study (100%) believed that businesses expect students to have strong technology competencies. Teachers were very passionate about their areas of instruction being just as important and influential as the other classes that had a more obvious business link. An example was that there is an existing program for students sponsored by a large company where people volunteer to mentor and tutor elementary students. The administrator from school Y explained, "Nothing in high school. I think they concentrate on elementary schools because they are easier to deal with." A science teacher stated that everyone is very aware of the expectations that businesses have as far as skills, "Yet we, as a lower-socio economic area, are pretty much ignored from the very beginning. Why, if they are the beneficiaries of our teaching are they not more involved in the processes everywhere not just in the most prosperous school districts." Another teacher said, "Yeah, I think they just award the winners—businesses always want to separate and award the winners. Mentor the winner. We do have communities in schools, but that just helps with problems."

A teacher from school Y school said, "There are no people that volunteer their time at this school. Not a good message for students. Sometimes the students build up a real resentment toward rich areas within the same town they live in." Another teacher stated, "Oh, yeah, we have business participation in a limited way. About every other year somebody comes in and talks, you know like when we have a Career day. But when it comes to any support in this area of town, you can forget it. I

sometimes feel that we are used as simply an assembly line to get students through this experience. No high visibility.”

Seventy-five percent of the teachers and the administrator said that they would welcome partnerships with a business, also stating that they did not have any involvement from people in the community and that they would welcome the opportunity. A teacher expressed that they would welcome business involvement; however, many times businesses do not want to actually get involved in the training part of education. “They [business professionals] sit on boards and things like that, which will bring recognition to them as a ‘caring’ company.” Another said,

When we are developing the curriculum it is school wide, but we never have advisers from the community or the business sector—we wish they would come in at the school level or within the department. Then we could get a fresh view of what the students will need as they go out from here. How else are we supposed to know?

When asked whether the teachers and/or administrators perceived any difference in the technology skills when coming from other areas of San Antonio, in many cases, they grinned and then explained that it was rare that people transferred from the north to the south unless they had been kicked out of their school or “they are really down on their luck pretty bad.” Instead of being disciplined at their originating school, the district sends them here. “However, I do have a student that came from the southwest and seems to be doing alright.” One teacher says that there is a huge difference between the districts in the north and south, “The north—that is where I want to go.”

Every teacher and administrator (100%) I spoke to had done something extra for the students, whether it was going out and buying supplies, or mentoring and tutoring after hours. These were hard working teachers who felt unprotected by a system; the teachers felt helpless to change something they perceived as being out of control. A teacher from school Y expressed, “Don’t they know that we know what the other schools have and how is that supposed to make us feel?” When I asked them how, they could not tell me. They defended their students and their potential however, did not feel they were getting the same advantages and resources as other students in San Antonio.

Every teacher and administrator I interviewed described the inequality in access to technology as the “the digital divide” as directly influencing technology competencies. Another teacher described competencies in technology as, “Oh, the students are amazing and knowledgeable, but they are not getting their skills from this school.”

A technology teacher explained that even if some of the classrooms contained 20 computers, the teachers would not utilize them. “They would find another excuse not to use them.” A science teacher expressed concerns about computer use in the classroom, “I just don’t want to use technology and there are others in this schools that talk about it, but don’t really use it either. We don’t have the equipment anyways to make decisions about who has them and who doesn’t.” Another teacher said that even if they did have computers, they probably would not have the software programs because they are a less affluent school district, “people do not want to deal with us.” “Even if you have the desire to use a computer,” expressed by an English teacher, “if

you are an older teacher you are not considered to be one that should be invested in especially if you are near retirement age. The new teachers get all the new computers.”

Teachers understood the process of technology use, but felt very let down by the system. Teachers felt that it was because their schools weren't “showcase” schools, and the objective was more to keep a low profile and not draw negative attention to a district that was not adequate. Resources are tight and as funding continues to be a challenge, teachers must cope with getting by with less. Teachers from school Y explained that having one computer in the classroom does not involve students in using technology.

School Y's teachers expressed concerns that the schools that are chosen to be the “showplace for technology” are usually newer or remodeled schools. For schools that are older, a teacher explained, “Keeping up with technology is not happening. We have wireless at this school, but it goes out all the time and there are no people to fix it.” Similarly, the same teacher explained that many times they will get the infrastructure necessary for technology, but then no connectivity is provided. The teacher explained that the equipment has been sitting there for over a school year without being connected by the district. “By the time the technology is connected it is already outdated.”

Every teacher I interviewed (100%) strongly believed that they must somehow replicate skills that will be needed in the workplace. For example one teacher explained how they incorporate teamwork and the fact that a group is dependent on everyone doing their part. Students learn how to cope during a situation in which

someone does not pull their weight so the other members must find a solution to the situation. The teacher explained that they wanted students to know how the real world will be when they leave a sheltered environment. All (100%) teachers and the administrator felt that technology helped students prepare for situations where they would have to organize tasks to develop a process. Another teacher explained that their students have to do projects with technology and present to the class. After the presentation, the students conduct a self-evaluation and discuss how this experience will help them when they go to college. “I tell the students that it is not all about how the project looks and works. I stress how to get from A to Z that is important.”

A teacher from school Y said that students should have basic keyboard skills and that many of them do not want to put forth the effort to master the keyboard. Teachers reflect on that fact that when they were in school, they were required to take typing. Even the most basic technological skills are necessary for life in the business world, as many teachers attempted to emphasize to their students. “Students today feel that keyboarding is tedious and redundant even though it is a valuable skill when working on the computer.” This, they say, is because they like the action and movement of the computer and the fact that the computer generates the action and they simply respond to the action.

“It is very difficult to satisfy students with activities, and if you don’t, they either misbehave or give up.” Every teacher and the administrator expressed worry about the students not only having few skills, but also about their confidence to succeed in the real world. If they do not have confidence or the skills, the students are destined for low-level, low-paying jobs the rest of their life. Jobs that are in the business

world today involve technology. They also worry about how competitive the world is and whether their students will be able to compete against other students that had a strong foundation in their education.

Teachers explained that the world is becoming technologically based and yet they are still in front of the classroom giving lecture with the students taking notes. Every teacher I interviewed (100%) felt they must lecture to cover the content because of the pressure of high stakes testing. School districts are threatened because of their need to retain funding and teachers feel threatened to hold onto their jobs. Because of standardized testing, administrators and teachers did not always feel technology competencies in students was as high of a priority even though they were very aware that the students will need the skills when they enter their life after graduation.

A school Y technology teacher explained that 99% of the businesses are either evolving or are currently using technology as a common tool in their workplace. They feel highly responsible, therefore, for preparing students in schools to use technology. The technology teacher stated, "We've got to prepare our students in school so that we are not just teaching applications, but that we're teaching concepts related to certain applications." This cannot be done however, if promising high school programs are continually being cut because of budget concerns. Of the eight San Antonio high schools that had marketing programs, there are only three remaining. In these programs, students were actually involved in city projects that involved businesses. Students participated in a public relations project that informed the community about South Town and actually presented the data to the Chamber of Commerce.

A successful program described by a technology teacher utilized many different software multimedia programs and even sophisticated architectural software. This was so sophisticated and advanced that a student was able to be placed in an internship program at an architect firm. The problem is that few students use the program and do not have the opportunity to learn how it is used in the real world. Additional programs that are taught in the technology class were Office 2000, PowerPoint, Access, Word, and Excel. The instructor felt that this software program would help the students acquire employment because all were transferable skills.

### **Similarities between Schools X and Y**

As I spoke with teachers and administrators from the X and Y schools, they expressed how they have tried to involve business people in their school, but it was not seen as a high priority. They truly believe that if businesses did participate in the school process, students would be receptive to their involvement and contributions. Students feel secure and valued when people, other than teachers and school administrators, contribute to their education and are not monetarily compensated for their efforts. One teacher from school Y explained:

These people are so busy. It's like I can't go here, I can't go there. You know it's kind of like I just gave up because, first of all, I feel like I'm imposing on them. Second of all, I tell the students they are coming and then they call, if they call at all, and say they are not coming. I've just given up on it. If I could get a retired person to come in and help me that would be nice, maybe they are not as busy.

Business participation within schools X and Y was little to nonexistent, which reinforced their feeling of isolation. An English teacher from school Y said, “Maybe businesses and industry would rather us teach employees the basics their way.... however that is. I don’t think they know anything about teaching and learning. They have forgotten about education.” Teachers expressed the value and possibility of designing lessons, across the curriculum, based on a business model so the students will see relevance in the learning process. One teacher from school X however, expressed that involving businesses in the learning process would only “add another layer of complexity. By involving another part to deal with and oversee would just slow down the process.”

Teachers from schools X and Y felt that there were still many teachers and administrators who feared technology because they did not feel adequately trained. Schools X and Y teachers claimed that even if they did have access to technology, many teachers would not know how to use it. On the other hand, teachers said they felt relief that there was something solid to use as part of their daily tasks and also to use with the students. An administrator from school X said, “I think they [teachers and administrators] see computers as a threat, but I don’t think they know how to interact with it and use it like they should. They don’t take the time to learn about technology, plus they are uncomfortable with what they are doing.” Teachers explained that the training they received was through their own efforts. The district does not have a strong training program. It is called “on the job training.” Other teachers explained that they went outside the district for training, but it was hard to leave and get a substitute. Fifty percent of the teachers felt they had been adequately

trained and their skill level is high enough to utilize the limited equipment in their school. Of that 50%, about 20% felt they were not integrating computer use into the content correctly.

Teachers from both schools were very aware that technology helps students develop skills and secure a promising future. Teachers felt that there is more of an emphasis on standardized testing scores. District money is being spent on guides, learning materials, and workshops to help teachers develop skills that enable curriculum objectives to be met so that, ultimately, the district's security will be confirmed when the students score high enough on the standardized test is taken. Because of the pressures surrounding the test, a teacher's schedule is more regimented and structured. The overall fear for teachers is not teaching the one thing that may be on the test. Technology plays a role in this as well. Testing is a huge concern, but they talk freely and honestly about the success that students had with numerous remediation programs where technology is used for re-teaching. An administrator from school Y noted, "There is something that we are not doing as human beings that the computer is."

Presentations using PowerPoint are encouraged by administrators however, teachers from schools X and Y explained that students who did not have a computer at home had problems completing a project that incorporated technology. One teacher at school X explained that in the beginning when PowerPoint was the rage, "I required all students to present and develop a PowerPoint presentation, but then decided it was discriminatory in nature because only a few of my students had computers at home." Another teacher at school Y hopes that they could integrate

computers into the curriculum and begins every year by asking the students how many have computers at home. On an average, 20% of students have computers at home. This year, teachers stated, “The number of students who have access at home is even less than last year.”

Every teacher and administrator (100%) in schools X and Y expressed a desire to have businesses and the community join their schools as partners because teachers from schools X and Y feel as though they are not receiving any support from either. Businesses prefer someone who is fully equipped with technology skills but do not help or support schools to teach these skills. Participation of businesses at the school level is clearly visible in the business education classes; however, with the budget cuts that are occurring at the national, state, and district level, business directed classes are being minimized.

Teachers in both schools X and Y described without hesitation how firmly they believe that having strong computer skills are necessary in order to succeed in any vocation. Specifically, teachers felt that if students had computer skills coming out of high school, they will be able to translate these skills directly to entry-level jobs in the workplace even if it is not immediately after their public education.

### Introduction to Schools A and B

Schools A and B were grouped together by demographic characteristics. Both schools were classified as high socioeconomic districts in north San Antonio, Texas. This classification was based on the following funding and economic factors.

Ten percent of the people living in school A's district are at the poverty level. Similarly, school B's district has 6% at the poverty. I interviewed 4 teachers and 1 administrator from school A, and five teachers and one administrator from school B.

Local Education Authorities at A and B schools, which have low-income (at poverty) families according to the 1999 census, are represented in Tables 4 and 5.

**TABLE 4. Local Education Authorities (LEAs) Having at Least 2500 or 27% Children from Low-Income Families (Based on 1999 Census Update Data)**

District Name	1999 Poverty	1999 Enrollment	Percent Poverty
District A	5863	57283	10.2351483
District B	278	5029	5.52793796

Source: Texas Education Agency (1999).

### School A

School A is located in an affluent city within San Antonio. It is a newly developed part of the city and is considered by most to be the most prestigious and wealthiest part of the city. School A was, at the time of my research, only three years old and considered and marketed as “the showcase of San Antonio.” It is a beautiful high school with an architecture that is contemporary and seemingly grown-up. It felt

focused and organized as I walked down the hall. The administrator proudly stated, “We have the very best technology facility in the city. In many ways we are the school of the future. A showcase for community people to come and see what can be done in schools.” The school seemed more like a high-end university than a high school. The demographics for school A are shown in Table 5.

**TABLE 5. School A Population, Ethnicity, and Gender by Grade Level**

Grade Level	Student Count	Percent of Total	Ethnicity Statistics					
			Ethnicity	Student Count	Percent of Total	Gender Statistics		
Ninth Grade	894	29%						
			Ninth Grade African American	31	3.50%	Female	14	45%
						Male	17	55%
			Ninth Grade Hispanic	223	25%	Female	134	60%
						Male	89	40%
			Ninth Grade Native American	4	0.40%	Female	2	50%
						Male	2	50%
			Ninth Grade Asian/Pacific Islander	52	5.80%	Female	23	44%
						Male	29	56%
			Ninth Grade White	584	65%	Female	316	54%
						Male	268	46%

Out of total of 3,135 students, 894 are Ninth Grade, constituting 20% of the student body.



TABLE 5. Continued

Grade Level	Student Count	Percent of Total	Ethnicity Statistics								
			Ethnicity	Student Count	Percent of Total	Gender Statistics					
Junior Year	665	21%	Native American	3	0.40%	Female	2	67%			
						Male	1	33%			
			Asian/Pacific Islander	42	5.50%	Female	22	52%			
						Male	20	48%			
			White	527	69%	Female	258	49%			
						Male	269	51%			
			Out of a total of 3,135 students, 768 are Junior Year, constituting 24.8% of the student body.								
			Senior Year	665	21%	African American	3	4.50%	Female	20	67%
									Male	10	33%
						Hispanic	158	24%	Female	75	47%
						Male	83	53%			
Native American	2	0.30%				Female	1	50%			
						Male	1	50%			
Asian/Pacific Islander	39	5.90%				Female	18	46%			
						Male	21	54%			
White	436	66%				Female	215	49%			
						Male	221	51%			
Out of a total of 3,135 students, 665 are Senior Year, constituting 21.2% of the student body.											

Source: Texas Education Agency (2004c).

Teachers and administrators from school A are very aware of the differences between school districts in San Antonio. The administrator described, “It’s the haves and the have nots, it is the same old pattern that you see in society. Those that have, will always have, and those who don’t seem to get further behind.” They go on to explain that the school is trying to run extended hours so students who don’t have access to computers at home will have access at school. They explained, “I think the chasm is widening with regard to that even though we’ve had legislation that tries to narrow that things are happening and the students get further behind then they ever were before. Even knowing this, the teachers are unaware how other schools that are less fortunate operate.” One teacher explained, “I would say that the technology here is really inadequate. For 15 people, there are only two LCD projectors between us.” The administrator explained that every department has their own LCD projector. Teachers remain unaware that other schools in San Antonio have as few as one LCD projector per 200 teachers.

A teacher from school A described from the point of being interviewed for the teaching position, they had to prove that they could use technology. Teachers felt an incredible amount of pressure to use technology, yet the teacher did not feel they could or should use technology every day. They described, “I feel incredible pressure to use technology every day even when there is not a fit. When am I going to teach the content? If I don’t cover the content the students are not going to pass the test and then I will really feel the heat.” Of the 4 teachers interviewed, 3 (75%) felt that teaching with technology is more time consuming and time is critical when you have a test looming over your shoulder every minute of the day. Further, teachers from

school A believe that when you utilize technology, “you have lost a day” of content and instruction. “It is hard to figure out what to eliminate and be able to incorporate more technology in the classroom. A plan to use the computer takes too much time.”

The administrator described pressure from the state to use and learn technology skills. They described the connection, “The state has mandated technology integration, has provided technology resources, and now is holding our district accountable for proving that the teachers are utilizing the resources, so it trickles down to us.” Therefore, much of school A’s professional development revolves around the use of technology in the classroom. Another teacher from school A stated, “We have to spend two in-services days with technology and then we have a product to show. Well, that’s not really the issue. The issue is that we’d like to spend time creating something that we can use on a daily basis.”

School A has many opportunities for training as well. Teachers have the opportunity to participate in the following training activities as shown in Table 6.

**TABLE 6. Training Opportunities Available to Teachers in School A**

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**Technology Professional Development**

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In order to effectively integrate technology as a teaching and learning tool, teachers need to have access to a wide-range of professional development opportunities. The goal of the Educational Technology department is to provide a variety of experiences for teachers to build their instructional technology capacity and to ensure that all educators and students master the Technology Application Standards.

**District Technology Professional Development:** Educational Technology courses integrate content and technology standards. Each class is structured into two parts, coursework or actual “seat” time, and classroom application or “follow-up.” Participants receive credit based on instructional implementation.

TABLE 6. Continued

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**Technology Professional Development**


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**Campus-Based Staff Development:** The Campus-Based Staff Development (CBSD) program focuses on providing on-site technology professional development taught by campus technology leaders. The campus-based courses are scheduled through ATrain and are available to all teachers.

**Connected University:** Connected University provides teachers and administrators with an opportunity to participate in self-paced or instructor-led online professional development. In addition to online courses, Connected University offers vast resources through How-To's, Recipes4Success, and online forums where educators across the nation can communicate to share ideas and practices.

**Technology Courseware (Independent Study):** Online Consulting Courseware is designed for independent study by teachers. Courseware includes manuals and accompanying CD's. Teachers can use ATrain to search for and request existing courseware titles.

**Elementary Keyboarding**

In order to address keyboarding skills included in the State Technology Applications TEKS and to assist students in becoming more proficient in the use of technology, a district-wide keyboarding program has been undertaken for elementary campuses. First and second grade students use the Kid Keys program for the first ten minutes of computer lab time. Fourth and fifth grade students follow a typing tutorial called "KeyWords" using the AlphaSmart units for approximately six weeks. Pre and post-test scores of fourth and fifth grade students show increased speed and accuracy in keyboarding, with an improvement in overall computer skills by way of increasing access to technology.

**GradeSpeed**

GradeSpeed™, an electronic grading system provided by Campusware, was purchased by the District at the end of the 2001-2002 school year. GradeSpeed™ allows K-12 teachers to easily record, manage, and submit grades for printed progress reports and report cards. Teachers are able to access and modify their grade books from any computer on the campus, or from home over the Internet. In the near future, GradeSpeed™ will also manage student attendance data, and eventually provide parents with access to real-time progress report information any time of the day or night from any computer with Internet access.

**Individual Teacher Websites**

\*\*\*\*\*TeacherWeb has been implemented as part of the District Plan in the Fall of 2002. All \*\*\*\*\* teachers are expected to update Web pages with essential classroom information to enhance communication with students and parents. Teachers are able to create and edit Web pages from within their browser from home or from work (Internet Explorer or Netscape.) In addition, teachers are able to upload web pages created in other programs.

TABLE 6. Continued

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**Technology Professional Development**


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**Multimedia Computers in Every Classroom**

Classrooms across the District are equipped with at least one multimedia computer in addition to standard student computers. These multimedia computers provide teachers and students with the ability to produce video presentations and other multimedia projects, which can then be stored on CD's for future presentation or modification. The Educational Technology Department provides staff development on the use of these computers. Eventually, teachers and students will have the skills needed to produce class video projects, multimedia slideshows, and electronic portfolios on which student work can be appropriately stored and viewed.

**Student Technology Application Standards**

\*\*\* has taken the TEKS and created Technology Application Standards. The \*\*\* represent a course of study that incorporate and expands upon the TEKS to ensure that all \*\*\* students receive an excellent education.

Students in grades K-2 gain basic skills such as inputting information, beginning touch keyboarding and becoming familiar with the computer. Using technology, students access information that can include text, audio, video, and graphics. They use computers and related technology to make presentations and prepare projects for foundation curriculum areas. In addition, pre-kindergarten guidelines for Technology Applications were made available to schools in December 1999. They articulate what three- and four- year old students should know and be able to do using technology.

Students in grades 3-5 use proper keyboarding techniques and acquire information by selecting the most appropriate search strategies. Students use word processing, graphics, databases, spreadsheets, simulations, multimedia, and telecommunications. They solve problems, communicate information in various formats to a variety of audiences, and evaluate their results.

Students in grades 6-12 become fluent in using multiple software applications and applying them across the curriculum. They build on the knowledge and skills mastered at the elementary school level. The students continue to demonstrate keyboarding proficiency in technique and posture while building speed. Students are introduced to increasingly complex skills and integration activities as they progress through elementary and middle school. These skills will provide a foundation for life-long learning in the information age.

TABLE 6. Continued

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**Technology Professional Development**


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**Technology Standards for Educators**

The State Board of Educator Certification (SBEC) has approved educator certification standards in Technology Applications for all beginning educators. These new standards are part of the new ExCET test frameworks in Pedagogy and Professional Responsibilities and are scheduled for implementation in fall 2002. The new standards address what all teachers should know and be able to do as applied to the Technology Application Student Standards.

The Texas Education Agency recommends that all educators strive to meet these SBEC standards. To support this recommendation, and to assist all North East educators in meeting these standards, a committee of central office support staff, teachers, librarians, administrators, and community members are developing the \*\*\* Technology Applications Standards for Educators that address the standards through integration in order to improve teaching and learning.

**Technology Excellence Indicator System**

The Technology Excellence Indicator System (TEIS) is an assessment tool used to identify areas for campus technology growth and development. The TEIS includes several indicators that address standards, integration, communication, and infrastructure. Campus technology leaders and Instructional Technology staff will work together to evaluate campus technology needs and develop plans to ensure student and educator mastery of the Technology Application Standards.

**Wireless Labs**

Wireless technology increases the ratio of computers to students. Wireless labs give teachers the ability to move computers into the classroom instead of moving students to the computer lab. This provides teachers with more flexibility in time and space so that they can arrange their schedule and classroom as needed to maximize student learning. Wireless technology provides increased access and versatility so students, administrators, teachers, librarians, and other staff members can use technology in a variety of learning environments.

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Much like teachers in schools X and Y, every teacher interviewed at school A did not experience direct interaction with businesses. One teacher remembers many technology people demonstrating the use of technology when there was the initial push to place equipment in their school. Since then, the district office collaborates with the business and deals with the purchase of equipment. A teacher at school A also makes the suggestion, “What I would like to do at some point and what I think

would be kind of a good idea would be to see if a kind of a simulation where you could have contact in business to see if they would hire your students based on résumés that they produced things like that where they could kind of judge things like that. It hasn't figured into what I am doing right now.”

The administrator for school A explained how their school has a group of business partners that work with them on an advisory committee and have helped in getting some exposure to business, marketing, and planning. They stated that there are approximately 80 businesses that participate in a job fairs and want students to come work for them. The businesses even allow for students to spend a day with them at work so they can see the workplace and the skills that the employees are using. The area business association is also a collaborator to secure technology suggestions and curriculum opportunities for integrating business practices with the curriculum. They described how extensive the business advice extends with regards to technology and also how these businesses mentor students at the school. The administrator stated, “We have incredible input from business and ultimately the community.” They described a wide spectrum of people who participated in their school activities: banks, CPAs, and even the city of San Antonio.

School A has a business program that actually finds internships for students in their junior and senior years. The business teacher explained that the students must know software programs such as Word, Excel, and PowerPoint. Internet skills, including navigation and e-mail skills, must also be at a high level of proficiency. For example, a hospital in the area has very strict requirements for the types of students that the school sends and the skills that are required. They must have

average grades and technology skills. They described, “A very dynamic program” that integrates businesses that are not high tech, but will give the students a sense of responsibility and how it is to work in a real business.” They stated repeatedly, “Every employer I work with requires students to have computer skills.” The teacher also stated that they believe that when they teach the students business ethics, responsibility, and respect, they are instilling attributes that businesses require.

Involvement with parents is visible when visiting the district web site. Because access to computers at home is so high, providing a portal for parents makes sense. This is a note from the Superintendent explaining the system.

Dear Parents,

We are excited about bringing you this technology to monitor your child’s progress in school. The Parent Portal is like having a daily progress report from each teacher. This is a secure Web site that you, the parent, can use to email teachers, check grades, view attendance and monitor food service accounts. We will also be adding more options periodically.

The goal of the Parent Portal is to create a better partnership and dialogue between \*\*\*\*\* parents and teachers. We hope that you will use it regularly and become a partner with us in your child’s education. Information on how to register yourself and your child appears below. If you have any problems using the Parent Portal, please contact the help desk at\*\*\*-\*\*\*-\*\*\*\*.

Sincerely,

A teacher at school A expressed how difficult it was to integrate technology competencies into the curriculum. Also there was a real tug that if they did not integrate technology, the students would not be able to build their competencies. The major technology competencies are dependent on training the teachers' and their ability to use and teach technology. An additional burden was the pressure of high stakes testing. They felt so much pressure to equip students with the content. Technology was seen as being detrimental to the coverage of the curriculum because it took more time to prepare a lesson and if the technology failed it was lost time.

Three teachers (75%) at school A addressed the question about computer abilities and the differences in skill levels when students come from other areas schools. A teacher specifically stated that "Their academic skills and technology skills are nowhere near what our students are that went through or come up from the districts elementary and middle school feeders." The geographic differences in access and skill levels are immense. Further, the teacher stated that sometimes transfer students catch up and sometimes they do not and, as a result, they feel isolated and left behind.

They also felt that many students outside of Texas are not as prepared. When students do transfer, "students who come in from outside as a rule need remediation and need more support to catch up." One teacher did not see a difference and had not experienced a problem even though they never had transfers from the southern part of San Antonio.

All the teachers at school A were more in touch with what students will need in the next 10 years than businesses. The teachers talked to the students about the real-world connections and tried to incorporate some kind of business exposure into their

lessons hoping that the students could see why they are taught certain skills. Could it be that businesses get so involved in the process of conflict resolution or, as they say, “putting out fires” that they do not understand that for a business to survive they must have a labor force that is well grounded, skilled, and progressive? A teacher reflects on the expectations of businesses by stating, “In many cases, business people want an instant product.” Investing in education however, does not show instant results. Instead, it is years of learning development that must reflect a broad view of society. The rewards that will be realized from student involvement will not be immediate. Many times this reward will not be tangible and measurable, which underscores exactly why many do not see involvement necessary or profitable. This is different when discussing technology companies. They may, for example, see that many of their future customers reside in the schools and if presented the opportunity, teachers will be the catalysts for developing and teaching their future customers. Unfortunately, our economic system is not built upon a single promise of technology oriented employment or sales.

### **School B**

School B is located in an older, affluent and prestigious district within San Antonio. On the city’s web site, the following statement is made about education and the community.

Those of us who have grown up in [school B] value the uniqueness of our neighborhood. For living, learning, working and shopping, there is no better

place to live in San Antonio. Many of us who grew up here have gone off to college and returned [the school B area] to raise our families.

This is a very strong statement for a district to make however, in this case most of the students do go on to college. The demographics for school B are represented in the Table 7.

**TABLE 7. School B Population, Ethnicity, and Gender by Grade Level**

<b>Grade Level</b>	<b>Student Count</b>	<b>Percent of Total</b>	<b>Article I.</b>	<b>Ethnicity Statistics</b>				
Ninth Grade	371	27%	<b>Ethnicity</b>	<b>Student Count</b>	<b>Percent of Total</b>	<b>Gender Statistics</b>		
			Ninth Grade African American	9	2.40%	Female	3	33%
						Male	6	67%
			Ninth Grade Hispanic	100	27%	Female	42	42%
						Male	58	58%
			Ninth Grade Native American	0	0.00%	Female	0	.
						Male	0	.
			Ninth Grade Asian/Pacific Islander	6	1.60%	Female	3	50%
			Male	3	50%			
Ninth Grade White	256	69%	Female	129	50%			
			Male	127	50%			

Out of a total of 1,351 students, 371 are Ninth Grade, constituting 27% of the student body.

**TABLE 7. Continued**

Tenth Grade	333	25%	Ethnicity	Student Count	Percentage of Total	Gender Statistics	
			Tenth Grade African American	7	2.10%	Female	1 14%
			Tenth Grade Hispanic	78	23%	Male	6 86%
						Female	36 46%
						Male	42 54%
			Tenth Grade Native American	1	0.30%	Female	0 0.00%
						Male	1 100%

TABLE 7. Continued

Grade Level	Student Count	Percent of Total	Article II. Ethnicity Statistics			
			Ethnicity	Student Count	Percent of Total	Gender Statistics
			Tenth Grade Asian/Pacific Islander	3	0.90%	Female 1 33%
			Tenth Grade White	244	73%	Male 2 67%
						Female 107 44%
						Male 137 56%
Out of a total of 1,351 students, 333 are Tenth Grade, constituting 25% of the student body.						
Junior Year	322	24%	Junior Year African American	3	0.90%	Female 0 0.00%
			Junior Year Hispanic	60	19%	Male 3 100.0%
						Female 30 50%
						Male 30 50%
			Junior Year Native American	0	0.00%	Female 0 .
						Male 0 .
			Junior Year Asian/Pacific Islander	2	0.60%	Female 0 0.00%
						Male 2 100%
			Junior Year White	257	805	Female 116 45%
						Male 141 55%
			Out of a total of 1,351 students, 322 are Junior Year, constituting 24% of the student body.			
Senior Year	325	24%	Senior Year African American	6	1.80%	Female 2 33%
			Senior Year Hispanic	79	24%	Male 4 67%
						Female 43 54%
						Male 36 46%

TABLE 7. Continued

Grade Level	Student Count	Percent of Total	Article III. Ethnicity Statistics			
			Ethnicity	Student Count	Percent of Total	Gender Statistics
Senior Year	1	0.30%	Native American	Female	1	100%
				Male	0	0.00%
Senior Year	2	.060%	Asian/Pacific Islander	Female	2	100%
				Male	0	0.00%
Senior Year	237	73%	White	Female	118	50%
				Male	119	50%

Out of a total of 1,351 students, 325 are Senior Year, constituting 24% of the student body.

Source: Texas Education Agency (2004c).

School B had a totally different atmosphere than school A. The one constant however, is the seriousness of receiving a quality education. The high school was older yet perfectly maintained. The outside looked traditional yet so evenly groomed with every shrub in place and sculpted to perfection. Inside there were no students roaming the halls and when you looked in the rooms, everyone was busy and talkative but in a highly organized manner and formal setting. There was not a student or item out of place. Teachers were active and busily teaching and guiding students in every room. This was a very serious and traditional setting. When I asked a teacher about the environment they stated,

This is a very high exposure school because the parents are very involved. Most parents work in the area, only miles away, and are very active in all aspects of this

school. Sometimes I feel that they are too involved because sometimes they support the kids instead of the teachers. The kids basically get anything they want.

As I toured school B, I was overcome by the amount of technology in every room and in the library. More importantly, there was not an idle computer; all computers were occupied and students seemed extremely capable of using them without any assistance from teachers or librarians. There was an overwhelming feeling of competence both technologically and academically. The access to computers was overwhelming. Teachers could bring in entire classes to work on projects.

Further, school B housed a computer training faculty in the basement. The basement was packed with printers, computers, wireless laptops, video equipment and a television studio. I had never seen a workplace with this many computers or equipment in one area available to teachers. All the computers and equipment were new. Only students that were student aides had access to the equipment, but teachers could come to the basement area at any time; however, I was told there was not an apparent need because technology access was either satisfied in their rooms, computer labs, library, or portable wireless labs.

Students from school B have access to different learning technology tools at home. For example, the district uses a computer writing program at school that allows students to practice the same skills from their home computer through the Internet. All (100%) the teachers interviewed expressed their support for these types of programs because it encourages parent and family support. In addition, all teachers have a web page with added resources that students can utilize from home.

This allows parents to help students gain access whenever there was a need while away from school. Teachers post summer readings and assignments so the students can continuously learn year-round, even in the summer months. When asked whether students had access at home, teachers stated that very few of their students do not have access at home. “I would not know it if they did not have access, because if they do not have access at home they can always come to the library.” Students have the library in the high schools (which serves as a public library on the weekends, evenings and during lunch), and in their classrooms so they can get to it very easily. A teacher explained, “I do not have a single student that does not have access.” In addition, each library had a streaming video capacity. The school is trying to gain community support for additional funding that would bring in 1,600 wireless laptops into the district next year so that every student will have a laptop computer.

There was a consensus from the teachers when asked about the positive support system from the administration and the staff had not yet included business advisors in the curriculum portion of instruction and the integration of technology. The staff and administration are deeply committed and recognize that students need to have extensive technological skills for the future, yet they have not achieved the next step of acquiring business support and involvement in curriculum issues. The administrators did see the benefit of having business advisors for developing core competencies in technology but had not yet included them.

A teacher in school B expressed that there continues to be a problem in booking the labs in the school; however, if the labs are full they are able to take the students to the library, which is full of computers. The library also serves as a public library, so

this facility receives funding from the city to have equipment and resources that are highly sophisticated for even the most proficient technology user. The librarian described, “Yes, we get so much funding at this library for databases and everything. It is really wonderful. It will not be an issue for students to not have access to computers.” If the library is not available then teachers can also check out the portable labs, which are a group of wireless computers for the entire class to use at once. There are three portable labs available on campus for teachers to check out. Sometimes the labs are assigned by department for the most important core areas, which means other areas, such as foreign language, have few opportunities to use the equipment. As the need and desire for lab use grows, teachers explained that there is no room for expanding or converting classrooms into labs. Therefore, the preference is to purchase the lab carts with wireless laptops so that the classrooms can house the lab activity. Students also have access while at home through the district web site as seen below in Figure 2.

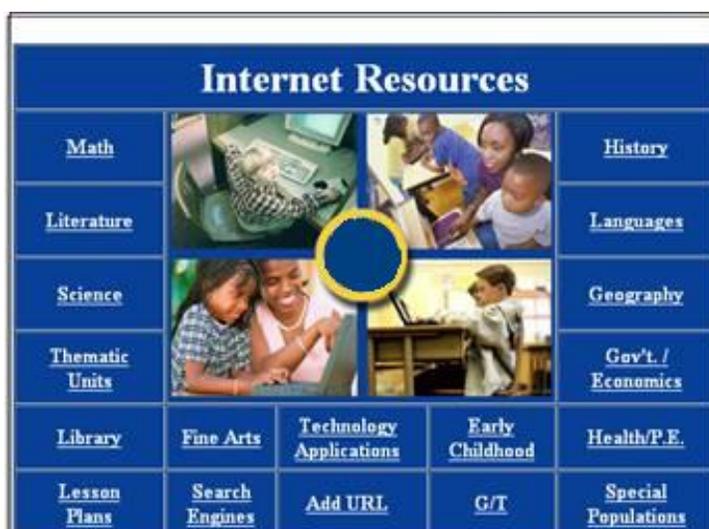


Figure 2. Internet Resources at School B

Teachers explained that if one of the teachers has an idea and cannot get access to the computer lab, it is not highly discouraging because most of the students have computers at home. It helps tremendously when a teacher assigns a research project that can be researched and completed at home. The librarian said, "There was no excuse for any child to say that they do not have access to computers, because they do."

School B had an incredible amount of assistance in gaining access to technology through discounts and free labor. The administrator explained,

Because businesses in the community are primarily owned by parents of the students in school B, many of those businesses came together and installed wireless connections for the entire district at no cost to the district.

The district was successful through these partnerships placing cable in all the schools at what they said, "For a very very low cost. We bought them in and they reduced the costs of their services." Both the cable company and phone company were major players in the process. This was truly a community project that was successfully implemented. School B goes on to say, "We had students here, we had people from all over the city. We publicized it, we had people from all over the city coming in and doing the wiring for the schools."

The administrator, upon arriving at the district, described very little technology fund and the need for wireless connections for the school. The solution was:

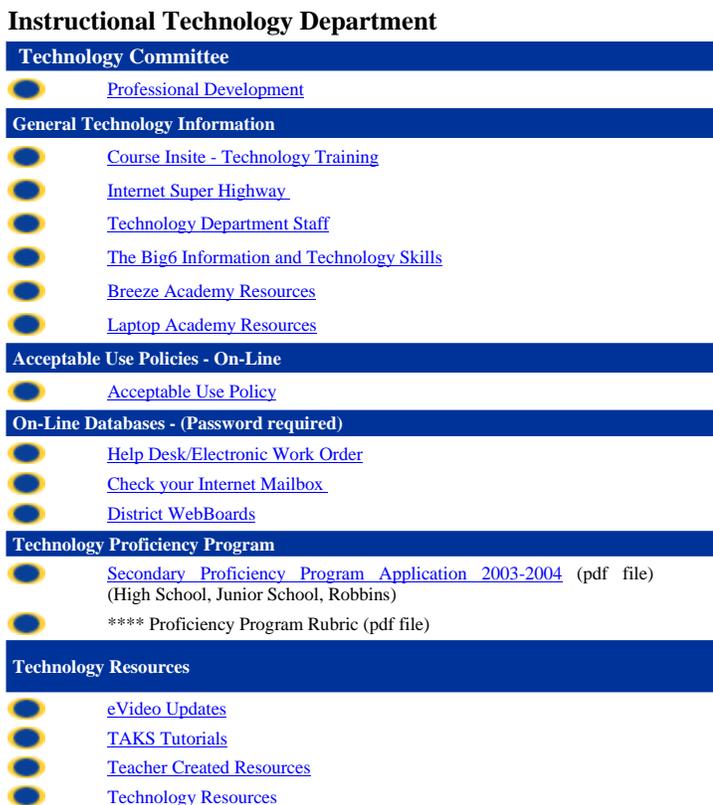
We did a NETDAY model where we had volunteers, community members, those kinds of people, coming in to help us wire our schools and get everything done.

Well, we built partnerships with several companies in which they would come in

and provide a project manager to make sure that everything was done correctly. We had a company that reduced the rate for doing all terminations with all of the connections.

A teacher from school B explained that even though they have a great amount of technology access, there still are some major issues. They explained that technology does not do away with a students' lack of responsibility. They stated, "Responsibility is a word they probably cannot even spell." They go on to describe how hard it is to get something to motivate the students when they are so affluent. They explained the structure as being, "students are groomed to take over the family business so they are indoctrinated at a very early age. They know they will be successful no matter what."

It is fair to say that if teachers do not have technology competencies, it will be harder for students to acquire, integrate, and develop their technology competencies. School B teachers, in addition to the nine-hour requirement that is written into the employment contract, have a proficiency program. The administrator described the program as, "Professional development is extreme and training is always available." The following is a menu of the various categories offered to teachers for professional development opportunities.



**Figure 3. Professional Development at School B**

Teachers from school B are described by the administrator as being disgruntled because they are having to go through training that is overdone and is also as one teacher described, “a tug of war.” They asked, “Why do I have to go through this?” Teachers are required to actually rate themselves, develop a plan for improvement, and prove that they can actually perform computer skills. The self-directed proficiency plan was not successful. The administrator said that teachers often under-rate or over-rate their skills and thus, their proficiency plan does not work. This year the school implemented a cohort model and a self-directed model that was about 50/50. This way the cohort works to help teachers develop skills and arrange times for training. The administrator described this as “a model that builds capacity within

the schools where if one doesn't have the answer another person within the cohort will have the answer." They also described the downside of the model as being a very time-consuming program. The administrator described that now they have all these little cohorts that are "running our people ragged." As a result of the extra work, 21 teachers were compensated monetarily to become teacher leaders and were provided with a lap-top.

The administrator at school B described their district technology program as extensive and fluid. Since all schools are wireless, the resources expand to another level. The administrator described, "You would not believe some of the incredible things that are happening in our schools right now. I mean I'm talking from first grade all the way to 12<sup>th</sup> grade." School B had developed this program based on national standards and also state standards. The program is described as being built on a structure that requires 25% teacher participation and 75% student participation in technology. The programs are designed to help the teacher facilitate the use of technology with content material; however, teachers describe the process as occasionally confusing. Sometimes the teachers get lost in the functionality of the computer and forget the content is the main focus. They also said this was worrisome for students. Depending on skills, the computer functionality can blur the content material and they end up learning a software program rather than learning the information or needed content. The administrator stated, "We're just not at that stage where teachers are truly integrating technology."

A teacher from school B commented that it really is dependent on the socioeconomic status of the cliental.

Most of the students around here have relatives in businesses and if it is not their dad's law practice it would be a medical practice. They own stores and own businesses so the students get a lot of exposure and experience. In addition, business involvement is a timing issue because before business people can spend a lot of time in schools and they have to be able to learn about the needs of the educators and the students.

From an administrator that understands technology and their stand point, the relationship they have with technology businesses is that "if I can get a part in my hand, if I call today and I have in my hands the next day, the computer is up the next day and I don't have dead time. So to me, that is a partnership."

The administrator from school B explained that they spend a lot of time developing relationships with technology companies so they can have more successful bids. It takes time and purchasing power to be able to get the lower costs. In fact, they explained that because of a long-term partnership with a specific vendor they receive a 42% discount rather than the 34% discount that other schools receive. They attribute this to "the relationship that we have with them." The administrator went on to explain that if there are issues that occur, "the technology vendor will send a Tech Support engineer at no charge to work with him/her the whole day in resolving technology issues in the district, it's because of those relationships that we've built that it makes it that way."

Funding was also available for the students participating in the business class. Several business partners sponsored the marketing club and contributed monies so students could travel to competition. For larger projects, the school financial support

is a smaller amount, but in some cases funding is still available for smaller scale projects.

Technology can also be seen as a handicap for teachers. A teacher at school B expressed how difficult it was to integrate technology into the curriculum. They strongly emphasized that technology was extremely important; however, the state requirements had placed such a burden on teachers and students that pressure just to equip students with the content. Technology was sometimes a deterrent for covering the curriculum. Another teacher at school B explained that in some ways, technology has been detrimental to the students because of plagiarism issues. The teachers explained that the students do not see any harm in copying something because of the work they have to do on the Internet to find the information. “The students don’t think it’s wrong. They spend more time cutting and pasting than it would take to sit down and write the paper.” They go on to explain that the students believe that once the information is printed, it is the truth. When technology is used, there must be a lesson on what is a reliable resource, such as a library and primary resources. It is imperative to teach the students how to understand the difference between reliable and unreliable sources.

### **Similarities between Schools A and B**

School B, in particular, had an incredible amount of assistance in gaining access to technology through discounts and free labor. School A said, since they were new, they would begin working on acquiring the same kind of support from area

businesses. School B actually had businesses install wireless throughout every school in the district.

The access to technology and training in schools A and B is offered in a menu of offerings for teachers and administrators. School B had a training facility in the basement so that teachers could come down at any time and practice or develop a lesson when ever they wanted. Both schools offered continuous training opportunities and offered teachers and administrators computer access during summer months to expand technology lesson integration while providing them with an honorarium. This translates to student exposure and the building of student competencies.

The curriculum for schools A and B required for students to take at least the basic computing classes so they would all have the basic skills. A teacher stated, "Given our socioeconomic status of this area the vast majority of students have computers at home so they know how to use them. They already have the interest so they tend to pursue upper level courses." Both districts offer Web mastering and video tech classes that incorporate video technology with computer technology. Students who are provided with the opportunities become very skilled. For example, a teacher described many of the student's ability level as high. So much that when they graduate from high school they are ready to go into Cisco Systems work. "We offer tremendous levels for learners if you want to pursue it."

Schools A and B had classrooms with at least three working computers per classroom. Science and math had at least nine computers. Both schools suggested

they needed more “goodies” to be in the labs that were more specific in different subject areas.

Schools A and B had T1 line connectivity, which is faster than DSL or anything other Internet connection that is available. In addition, all rooms were connected where e-mail was available, plus access to a common folder for teachers to share ideas and technology lessons. Both schools were connected through the district network and also had the district Intranet so that all resources developed could be shared between schools.

Even with lab access, both schools described how time consuming it was to plan and use the computer lab. One of the teachers stated, “It is impossible to do this a lot, because by the time we get to do it again, the students are going to forget how to use the software. It is time consuming and we have a curriculum that is so intense.”

Schools A and B had Web boards where teachers could advise students in a chat format or post responses to questions they may have on homework or projects. It was stated that the students love the connection with the teacher and that it motivates students to try harder to develop a quality product. This service is also available for parents so they can ask the teachers questions and follow-up on homework assignments. School A described their system as being very efficient because of the availability on 8-10 servers. Teachers give links for research and hints for Internet searches so students will have access to resources while away from the school building.

Both schools A and B had access to streaming video. School B stated that they had worked with a local university to develop and refine the process and build a huge

library for their use. School B stated they have such a solid and high-speed connection they could download video onto a computer and then view at their convenience. The connection was so solid and fast that the videos could run right through the Internet. School A also described an extensive lesson planning database to help teachers store and retrieve lesson plans so all resources and ideas can be captured and used throughout the district. Technology and Internet information was organized and stored within the templates so teachers could use the template while teaching their classes. The standard lesson plans were structured from a template for everyone to use which gave curriculum and content consistency. Lesson objectives are stored within the database so teachers must click a button for content and it automatically moves the objective into the lesson plan.

Teachers at both schools are required to participate in nine hours of professional development using technology. School A described their program as fitting with the teachers schedule so that it was not difficult for them to receive training. For example, they could attend after-school training classes that rotate class offerings. In addition, teachers took leadership roles in developing technology skills within their departments so that the responsibility of attending classes could be distributed more evenly. Teachers come back from the training and train smaller groups of teachers.

Training for both schools is not only conducted during the school year. The bulk of the training is done during the summer. School B described their summer program:

We are here everyday during the summer and we've got people in our lab all summer long going through courses. All of our new teachers, once we sign them

up as a new teachers, we send a letter out to them stating that they have to have two on-line courses done before coming to our first in-service that we offer in the beginning of the year.

This structure is given credit for helping new and more experienced teachers grow through the use of technology.

The school B administrator stated,

A couple of years ago, our teachers were afraid to use technology but now, because of training and encouragement to learn more, teachers are using technology more than ever before. Teachers are using technology therefore, students are using technology.

Out of the eight educators interviewed in schools A and B, only 2 teachers expressed business involvement. Consequently, those 2 teachers were from a business class and technology department. Even though society is ultimately preparing students to participate in a business environment, there is isolation in how the skills are taught within the core areas and how the technology will be used outside of the school environment. Curriculum alignment was being implemented, but only among educators with no business involvement. Teachers and administrators did express an interest to improve business involvement and also felt that they could contribute to all aspects of their curriculum. (Data are further identified and categorized in Appendix F.)

## **Business Interviews**

Businesses within San Antonio, Texas, were the next group included in the research study. The main objective for including them in the study was because of an obvious connection between education and employment. In the U.S., we educate our children so they will be able to function as contributing citizens instead of relying on the government for support. Even though this is society's main objective, the question is whether there is a technology and business connection which would truly prepare our children outside the isolation of the school environment.

### *Business Interviews #1—Retail*

My first interview was with a store manager of a prominent retail store in San Antonio. The department store had been in San Antonio for over 60 years. The store employed over 300 employees and, because it was located in the southern part of San Antonio, it drew potential employees from every area of the city. The staff is primarily comprised of young people who are either in high school or have already graduated.

Technology in the store was described as having a great influence in the job functions of the sales associates and management. Employees are expected to use it however there is not any type of skills test given at the time of hire for evaluating skill levels. The interviewee stated, "We really do not ask any of our applicants or future employees to have any technology skills." They explained that it really was not a concern whether or not employees had skills, because 60% of the employees have high school diplomas, 20% are in high school, and about 20% have college

degrees. They stated the application does not ask anything about what computer applications they are familiar with and the applicants are never questioned about technology skills.

Since technology skills and use were not considered as a top priority for the retail store, what was considered to be an important skill? They replied by listing several characteristics that were important such as having a personality that was outgoing, polite, and punctual. They explained that these types of skills, not technology skills, would result in achieving adequate and above average sales. “That is why we train people to sell and not how to use technology.” On the other hand, the employees have to sign-in on the computer, which they described as being quite a struggle. “They are constantly forgetting their password and cannot even use a mouse.” Sales, however, is more highly regarded than technology competencies.

The store manager went on to state that, “Many high school students that we employ have a problem with business ethics. They are not mature.” They expanded on their idea by stating that if they have technology skills and no common sense, then they will not be successful in a competitive market such as retail. They furthermore stated that they do not want to train employees because they are very much aware of the fact that many employees will not make retail their job for life. The turnover is explained as frequent and continuous.

The store manager described how at one time their organization participated in programs for students and the community as well, but they stopped doing that quite some time ago. They explained that the organization feels like they are doing their part for education since they employ young people and they also pay property taxes.

They explained, “We can trust the professional educators to teach students what we need.”

The interviewee discussed different geographic areas and felt that it did not seem to make a difference in performance levels or technology use. They described that whoever comes to work was expected to follow the rules of appropriate conduct and perform well, no matter where they come from.

### *Business Interviews #2—Telemarketing*

Arriving at the telemarketing business, I was amazed by the extremely busy and loud business place. There were about 50 people waiting to be interviewed and about 20 more waiting for a skills test. The people waiting were mostly young people who wanted either a part-time or full-time job. The business is 17 years old and has always been located in San Antonio Texas.

The employee’s age was from 16-18 years old. The company is an equal employment business and allows for the employment of handicapped people as long as they could read and pronounce words clearly. All employees have to go through a criminal check before they are considered for training or employment.

Some of the employees have a GED or are in high school, but are not considered for employment unless they can read, write, and speak English clearly. In addition, they hire a large amount of bilingual speakers, but require it to be proper Spanish. The interviewee said that they do offer tuition reimbursement, “But most people do not stick around long enough to reap the benefit.”

Similar to the other retail businesses, the main concern was about employees accepting responsibility, being punctual, and exhibiting ethical practices in the workplace. The manager expressed concern that these types of workplace attributes were not being enforced or taught in the high schools. They expressed that workplace competencies were more important than being computer savvy.

At the beginning of my interview, the manager was very stressed, but as the conversation progressed, they became very willing to spend time explaining the business environment. I began by asking what kinds of technology skills were required when hiring and promoting employees. The manager explained that almost all the job functions included computer use however, if they did not have the experience on the computer the company was very willing to train them. If the company did train them, the expectation was that they would have the skills to advance and to do their job more proficiency and profitably. They stated, “Most students come to us from high schools and are very familiar with the computer and are not afraid of using it at all.” They explained that it was people over the age of 50 who needed the jobs the most and did not have the ability to use the computer. They explained, however, that many of their newer clients required some kind of Internet base so if employers wanted to advance within the company they would have to come in with technology skills. Otherwise, they will remain at a lower level job where the requirements are to read and use the keyboard and mouse. That is the main reason they do not remain dependent on high level skills. “We, or our company, must provide a wide-range of jobs that we offer.”

The training they conduct is dependent on the job they will perform. The company does not test on all skills sets. They give everyone a test to see how well they use the computer, read the computer menu, and use the function keys. They test all people on (1) cognitive abilities, (2) sales, (3) typing, and (4) data entry. The interviewee stated, "They must be able to do different types of functions or they would never survive."

New employees must all participate in three-week training before they have contact with any clients. After the three weeks, they are rotated through other types of training to make them well-rounded and competent employees.

The telemarketing company works with many schools, though mainly in a recruiting effort to continuously fill the positions that open daily. Schools also call them to see how many students they can send over to apply for a job.

The interviewee said that they were always very busy because they receive 500-800 applications a week. They said, "We hire about 300 people a week. About 25% of the applications are from high schools students or students who have just graduated and need a part-time job. We do a lot of rehiring because people come and go." They explained that they have a very high turnover, but that this was very typical of the telemarketing industry. They explained that there really was not time to prep the employees much, but if they were able to, there might be an increase in the longevity of the employment cycle. They do not have a training program or any consistence presence in the school, but admitted that it probably would be a good idea to help fill the employment shortage.

The interviewee explained that partnerships are good, but that the only thing that they do is attend job fairs for filling the gaps in workers. Occasionally they participate with the counselors to help them advise students about applying for work. They admitted that the only partnership they had or were interested in was one of cultivating a pool of potential workers. Anything other than that was too time-consuming and they felt, “there really is not the desire either. It is all we can do to just keep going every day.” When asked about the possibility of mentoring students while in high school, the answer was a definite “No.” They explained by saying that they come in contact with schools through the use of brochures which are sent to schools to help recruit more students.

Contribution to the business curriculum or any other curriculum was seen as another added task that no one had time for. “If they want to learn about business and what they need to do to be successful, they need to learn in real-time because the people here do not have the time.” They went on to say that the schools really had never asked for their input. They said, “Maybe if they would ask, we might consider trying to help in that way.”

### *Business Interview #3—The Military*

The military person explained that many people enlist because of tuition reimbursement and the GI bill after service or while enlisted. They described that in many cases the opportunity to develop skills, participate in job training, or attend a college or university would not be obtainable if the military was not an option. The

opportunity is presented as a four-year steady job with training and a contribution of \$39,000 for college or a technical school.

The military person described the differences between a rural and urban environment within the public schools of San Antonio. They explained, "Depending on the area, there are so many differences between urban and rural areas. I am talking about actually, the north and south." For example, they describe a nearby town that has a large number of students that score very high on the mechanical part of the test because they are from an agricultural area. They explained, "One school that is not in so great of an area the students haven't scored high and are coming out in the 60s and 70s which is not very high. In the world of education as the entrance into college and landing a good job, these students would be left behind. The military acts as an equalizer for the students. It doesn't matter where you come from ... the same opportunities are available." Once a person enters the military they have many opportunities to advance. It is based entirely on the recruits desire and motivation. The military individual described that job knowledge and opportunities has to be approached with a positive attitude. Importantly, they described the different levels of opportunities available in the area of mechanics where there are approximately 40 different jobs where people can be trained.

I asked them how the public schools fit with the military opportunities. They replied that in some cases the fit was very obvious. For example, if a potential recruit has taken a shop class, they were going to test very high on mechanical. If they are taking an environmental class they would test low on the mechanics portion of the test. There are opportunities, however, for changing tracks of training as well. If

someone is in a mechanical job training program and they begin showing indication of not being able to pass, they are shifted into training. Some of the jobs do require knowledge about the computer, and recruits are actually tested to make sure they will have the abilities to be successful. If they test out to have the competencies, they are sent to a tech school which is very much like a professional tech school.

Classifications of recruits are determined by the test which is broken into four different areas—mechanics, administration, general and electronics. Their score will determine their major training area. Technology is not a separate area of testing. The training is included, therefore technology skills are included and do not require aptitude testing. They explained,

The schools push technology, but you see, that gives them the basics. So, yeah the technology they are teaching them in schools—I don't think we are requiring them to know it. And if they have the basic knowledge from high school, they go and take the test, and it might open up that job in that area. They really could come in not being able to even use technology ... basically.

The recruits are indirectly tested for technology skills on the battery test which is classified as the general test that all potential military recruits must take to be considered for enlistment. They go on to explain that the test is actually at a 10<sup>th</sup>-grade level. The test is called the Armed Services Vocational Aptitude Battery Test which covers basic knowledge, word comprehension, basic electronics, and basic mechanics.

The interviewee described involvement with the schools as a way of recruiting enlistees. They explained that they help with ROTC on the different campuses and

actually help with judging some of their performances such as marching exercises. “The ROTC involvement helps us get into the schools so that we can talk further with the students.” Their involvement does not stop there. They also go into classrooms such as American history to talk with students about for example, World Wars I and II. They explained,

We talk about how the military was involved in the Gulf War as well because they will be able to remember that war. I make sure and go around the curriculum. The teachers actually call me at the beginning of the year if they want me to take over one of their classes.

They do not actively participate in the development of curriculum that may be related to skills that they would be looking for in recruits.

The interviewee described that their involvement is in addition to the school curricula because they try and reinforce routine, dependability, responsibly, and self-discipline. One of the other competencies is the respect for authority which is stated as, “This is the most important area that is deteriorating in the public schools. We make sure that all students that are involved in the ROTC program and are learning respectful for authority.” They describe doing other things such as setting up a table in the lunchroom and informing students like a mini-job fair. They stated, “One of the very important things that we do is that we stress that it is very important to stay in school. This enforces their academics as well as the school and we are supporting the school.” The military does state that they take those recruits who have a GED, but then they must score high on the entrance examination.

The military is an organization that is not able to support specific areas such as technology. They address many competencies from a very broad spectrum of recruits with varying skills and skill levels. They do, however, offer opportunities for recruits who are interested, and they work very hard in placing them in the right track for training. Technology is not seen as a critical track for training. Rather, they see a recruit as someone who has adequate skills in all areas of academics. Academics are seen as important, but they also stress other areas of equal importance such as critical thinking and decision making abilities. Technology is not officially within their testing structure but is considered as an element in the big picture.

*Interview #4 -Grocery Industry*

For 100 years, this San Antonio grocer has been an innovative retailer. Known for its fresh food, quality products, and convenient services, they strive to provide the best customer experience at the lowest prices. Based in San Antonio, they employ over 56,000 partners and serve millions of customers in more than 150 communities throughout Texas and Mexico.

I chose this store because of its location. The store is located right between the boundaries that divide the north from the south. Therefore, they draw employees from a very diverse area. Schools within the area are very different as well with the boundaries that are drawn strongly by location.

When entering the grocery store, I was overwhelmed by the activity. People were going about their grocery shopping as if they were preparing for a week-long storm. This was a ritual that people go through multiple times a month. People shop at this

store because it basically it is the only chain left in the city. Other stores have been priced out and consequently could not compete.

This grocery chain is very involved in the community and many philanthropic gestures. For example:

## **Excellence in Teaching Awards**

### **Teaching Awards Rising Star Award**

Less than 10 years of classroom experience. One elementary and one secondary teacher will each receive a \$5,000 cash prize plus a \$5,000 grant for his/her school.

### **Leadership Award**

10–20 years of classroom experience. One elementary and one secondary teacher will each receive a \$10,000 cash prize plus a \$10,000 grant for his/her school.

### **Lifetime Achievement Award**

More than 20 years of classroom experience.

One elementary and one secondary teacher will each receive a \$25,000 cash prize plus a \$25,000 grant for his/her school.

In addition, 30 regional finalists will be awarded \$1,000 each plus \$1,000 for their schools.

### **Principal Award's**

One elementary school, one middle and one high school principal will receive a \$10,000 cash prize plus a \$25,000 grant for each of their schools.

A total of 15 regional finalists will be awarded \$1,000 each plus \$2,500 for their schools.

The manager of the grocery chain is involved in an indefinite amount of school activities. The store contributes by adopting a school and provides mentoring acts of monetary contributions. Most of the work is being done at the elementary school level. They have done things like contribute for playground equipment and other

things that would help students learn and receive a positive attitude toward education. They believe that we lose students at the elementary level and are unable to regain their interest. One contribution that has been very influential is the announcement that teachers and 40 schools were selected to each receive environmental-based educational software, curriculum training, and historic tree saplings through the \*\*\*\* “Trees for Texas” initiative. The initiative is part of the company’s yearlong Centennial Celebration campaign.

The grocery store employs many age groups drawn from a wide area. The interviewee described the younger the group, the less intimidated they are by the computer. In the training they provide for new-hires, they state

The younger groups adapt to changes and learn how to use our technology a lot quicker than someone who hasn’t had the opportunity to go through all of the technology education. They do not have any problems with the scanner or the register which is really a computer.

The grocery store chain offers many opportunities for training. “We do depend on the schools quite a bit; I mean every school is teaching technology skills now.”

When asked about differences in geographic location of employees, the response was that they did not see a difference in where the trainees or employees came from. They explained that, “Ongoing training is for all employees and I have to sign them up. We find what weaknesses are apparent and then place them in a class that will help them. We also have mentors when they come into the store so they don’t feel isolated or left out.” The technology they use is very advanced and does require computer skills and training. They do not utilize any skills tests to assess their

computer skills, but do ask during the hiring interview whether applicants are comfortable with technology.

The interviewee also described other competencies that are extremely important to the grocery chain. They want to ensure that their employees are ethical and trustworthy. They do not administer any kind of test to see if they have a past experience that is unacceptable, but ask many questions and also require references. They also stress the need for employees that are dependable and responsible and can work as a team. They said, “Technology skills can be taught during training but it is much more difficult to instill in an employee a sense of loyalty and trustworthiness.”

#### *Interview #5—City Government*

Interviewing someone from within the government is difficult because of their hectic and unpredictable schedules. Most of the time they are out of the office or visiting potential business arrangements in the city. It actually took me six weeks to finally get an appointment made and when I arrived there was such a hustle bustle I was not sure that they would even see me. Finally I was called into a large room that could have fit 100 people, but more importantly, I was there.

The organization is a private non-profit supported by the local business community. Their existence relies on corporate citizens in San Antonio or as they described, “the who’s who” in terms of corporations and industries. Other partners exist, such as attorneys, realtors, and construction companies throughout the city. The partners hope to get some sort of indirect or direct benefits out of the projects they are working on. They are as they described, “more or less the marketing arm of

the city and city government. We are the organization that promotes San Antonio to companies that might potentially relocate or expand into the area.”

One of the companies projected to make an incredible difference in San Antonio and the funding of the south San Antonio schools is Toyota’s decision to locate in San Antonio. The interviewee described how they made sure that every factor in San Antonio was enticing to corporations. My interviewee actually developed the relationship and provided them with the information they needed to make decisions to choose San Antonio. This, in turn, benefits the entire San Antonio infrastructure that supports the economic growth and stability of the city. They predicted that Toyota will increase the existing workforce by 10% will also bring people into the area.

Involvement in schools was explained as being an economic motive. For example, they stated how a property owner in southern San Antonio was pouring money into a south side school in hopes of helping the school raise their test scores. The idea was that, “if the school district has high academics when businesses move in a southern direction they will not hesitate to move employees in.” I asked whether they thought that this was the only problem, lack of funding that existed and whether “pouring money” into the problems would lift test scores. They replied, “Probably not, but there was an initial investment that must be turned somehow and business people do not know what else to do to help schools.”

My interviewee explained how funding for school districts in San Antonio is a huge issue when selling San Antonio to outside corporations. Companies look very closely at the test scores and the school environment before they will even consider locating in an area. They want to make sure that the area will meet the needs of their

employees. The first element of the community that organizations and corporations want to be told about is the availability of an existing workforce and what opportunities for growth and training is already available for their workers. They explained, “We probably cross the line a bit too far sometimes and really just focus on the company’s needs.” They went on to explain,

The workforce in San Antonio is a challenge. I think it is a challenge that was recognized fully probably about as late as ... as recent as 20 years ago and we really started working on it. We are really behind other communities and we are really behind in education. We really don’t talk about it a lot with companies because quite frankly it’s my job to talk about the good things about San Antonio. They explained that there is certainly a good workforce, but from an educational standpoint, we are lacking and that is recognized. They stated, “We are so far behind we have to come together.” They explained that the city has reached the point of developing partnerships with companies by directing them to fund students and then hire them. Some partnerships they have negotiated include manufacturing, aerospace, and information technology. They actually have students in high school that earn dual credits while still in high school by attending a community college. This has provided students with choices so that they come out of high school with a specific set of skills.

Within the area of biotechnology and research, San Antonio has always had a strong foundation and is predicted to grow. The interviewee explained that it “is a small growth industry” in San Antonio. They noted, however, that San Antonio

cannot be compared to Austin. Austin has developed their intellectual property where San Antonio has not. The interviewee stated,

This is not going to happen here for a number of reasons. First, companies that have those types of expansions are not going to come to San Antonio because they are going to have a hard time recruiting employees. This is not because San Antonio is a bad place, but because the CEO of any company basically wants to know where am I going to go when this corporation gets bought, sold, goes out of business and decides they don't want me anymore. The answer is, they could just go to Austin. Well if that is the case, they will just locate in Austin.

I asked them how they felt about the millions of dollars being poured into technology in San Antonio schools. Bonds are passed time and time again that are earmarked for technology. They replied that the opportunity or need is obviously to understand and use the technology as a tool to help develop the skills that are necessary to compete. Even banking companies are not considered a sub unit to technology.

Another example in the lowest of jobs at the Toyota plant will require an aptitude for technology. What the schools call technology is not really an investment in technology, it's investment in equipment which yes, is technology, but the inference I think is that you are not installing these types of skills and this type of intellectual property or intellectual growth into these children and all you are really teaching them is how to use technology equipment.

They expand by explaining that schools will often throw money at problems but will not really address learning. They stated, "I think to some extent it really is just an

illusion.” They further made the argument that many products may require technology but the jobs are not “technology.” An important point is that schools cannot buy technology without nurturing the students in other content areas. Because a student can work on a computer does not mean that they are an expert in the use of the computer.

Technology and learning in the schools is important for the future of students who want to go on to college and as well as those who do not. The interviewee stated that the purchase of technology equipment is a bit of an oversell because even after the purchase of the equipment, it does not get used that frequently in the schools. “The use of the computer is not used to the extent that it is being promoted.”

The businesses in San Antonio have a very indirect relationship with the schools and by the time any kind of connection reaches the student level, it is diluted and non-serving. The interviewees discussed the funding that is provided by the city and that it is a coordinated effort at a high level. They expressed a need for a specific set of skills that will be needed in college. The colleges train them and the high schools supply the college students and the City provides the funding. Therefore, the direct relationship with the schools, students, and teachers is limited. They clarified by stating, “It’s all associated with marketing and getting businesses to come and stay here.”

#### *Interview #6—Youth-Oriented Organization*

This employer interviews and hires college students and students that are at least 16 years old and over. This specific office conducts all interviewing, hiring, and

placement of employee hires. It is a very large organization with branches in seven countries. They are one of the largest and oldest service-oriented organizations in the world. They take credit for inventing basketball, the New York marathon, and badminton. There are about 150 young people who work at the San Antonio facility.

When I interviewed the human resources person, I asked what types of skills sets they were looking for when someone applied to their organization. They stated,

We employ lots of young people to do things that help us serve the community. We have a ratio of one adult to 15 young people. We look for various skill sets such as computer data base work and also skills that include being able to work with teams, willingness to contribute, flexibility, and time.

The organization requires technology skills so that data can be entered into their database. The new employee has 30 days to become proficient in the use of the technology, or they are let go. The database is their primary way of acquiring revenue. The interviewee stated, "Some people can acclimate to the technology while others struggle. It depends on where they go to school. Many do not have technical knowledge. Overall, I do see more and more young people who do have technical skills." They go on to explain, however, that it is more than just geographic location. "We do have more of a difficulty with students that come from the west side, eastside and south side areas of San Antonio. From the north side we get mostly college students who are looking for work." They explained that the ratio of people in college and degreed is small, and that the primary applicant has a GED.

The interviewee explained that it is primarily the college students who have access to the Internet and to a computer. This is why, as a company, they have an

asset-based curriculum that will teach responsibility and respect as part of their job training. Many of the people that come to work there are what the interview called “A-s-s-e-t deficient.” They also work with the schools districts to allow for them to come in and teach about the asset skills. They work closely with the school districts to understand their focus and what is important to them. The organization does believe in training its employees and taking the time to train them if they do not demonstrate a high level of technology skills unless they have the desire to learn, work hard and expand their skills.

*Interview #7—Technology Company*

This company is a technology professional services business. They provide technology consulting to clients that come to them from either their inquiry or from their marketing department. Their customers are mostly small to medium-sized businesses. They employ software developers and project managers internally to provide and render a high level of consulting services. Typically, they sell a form of custom software applications to fulfill needs that businesses have and cannot be fulfilled by an off-the-shelf, commercial package. For example, their customers include an environment consulting company and the State of Texas.

The company has a training program that relates to the applications that they build and training is really not a large portion of their business. Typically, it takes the form more of a knowledge transfer at the end of a project debriefing rather than a more formal program. They conduct minor training for other larger organizations that have their own in-house development teams.

The interviewee expressed that San Antonio is expanding as a technological community. They said,

It's getting there. I mean our technology business as a whole in San Antonio. I guess the important thing for you to kind of get your hands on—most of our business is not in San Antonio. We do have some customers in San Antonio, but we have a lot of customers around the country. Actually, we have customers in Europe.

They expressed the desire to incorporate more service to clients in San Antonio.

Yeah, a lot of our customers are not in San Antonio, not only that we have I mean, the budgets are smaller in San Antonio then they are outside of here. So while our clients are still small to medium sized businesses typically those are smaller budgets, they are bigger in other places. I would say on a nationwide level our prices are a little bit lower because we are based in San Antonio.

The technology company has many clients such as one client in New York and Manhattan who uses them religiously.

When asked how successful they are in hiring people to work with them out of the San Antonio pool, they responded that it was difficult because they had built many relationships over those eight years with a lot of different organizations from which to recruit. "One of my partners is on the board of advisors for the Trinity University Computer Science Alumni Department and so that is a great channel for us to recruit. They also work closely with University of Texas at San Antonio (UTSA) and St. Mary's so they can look out for 'the smart people' and students that the professors have identified as being really talented.... On the average a San Antonio person is

probably harder to recruit but if you play your cards right, there are very good people here. We invest, in turn, in the university with our time to get to find out who the good people are.”

When compared with other places, there is a difference in technology skills. There seems to be, as expressed by the interviewee,

Certainly compared to other places there is a little bit of a lag in terms of capabilities, but I don't really see much of a difference between business to business within the city. This is fairly expected but we have some customers that are more technically savvy as others. We have customers in San Antonio that are as technically savvy as any other customers we have any where else in the world. We also have customers in San Antonio that are not as technically savvy as some of our other customers.

They noted one customer that manufactures material for furniture in a very old-school way. “It is a very blue-collar kind of organization: very manufacturing and assembly oriented, yet they have a surprisingly savvy technical group.” The company actually trained an organization to learn how to act as a team. The group has been working on a data base project and then trained them for two days. “That was great because we could better communicate with the individuals that we were working with. I guess the ability to invest in the work staff facilitates that.”

The only contact their business had with the schools was through a summer employee who spent the summer with us working through a program at UTSA. As far as high school they hosted one student. They stated,

We had a student who was a high school senior and he was great. Very sharp, very sharp. He was a little bit green in terms of being able to sit down and work on one of our projects, but he actually did a great job. We did have him doing quality assurance.

They describe the student as an 11<sup>th</sup> grader going into the 12<sup>th</sup> grade and far above average as far as his technological skills capability. They commented that the student was great and exceeded their expectations. “I mean we didn’t set them very high, but I mean he definitely exceeded them. And we will definitely continue to do that. It was a really good experience for everybody.”

The interviewee stated, that coming from an IT organization, they could not imagine anything more important than technology skills, “which sounds kind of goofy because obviously math and science and English are all important too, but I would say it is as important as any of the core curriculum. What are they, the 3 R’s—Reading, Writing and Arithmetic?”

The future of employment for students coming of schools is dependent in many ways on the economy and demand for people and services. The levels of jobs consistently advance. The interviewee stated that they

See a tremendous amount of automation and information systems being applied to more rudimentary roles. You know, we work with a company here that manufactures commercial air condition and when we first started working on it we built software for their accounting group to write reports on basically sales by region which is fairly simple, and that is a group that you would image would be able to deal with a computer. As we work more and more with them one of the

things—we started to building out small applications for other organizations within their company. For example, we built out some applications for their inventory guys to keep track of parts now that’s kind of pushing deeper into the organization.

More and more services are being provided through technological software applications. The interviewee described the tracking of parts for small companies,

They don’t have very many parts, but still what they wanted to be able to do is like track the life of the part. The part comes in and it gets installed into an application and it gets shipped out to a group and they want to know where the part is. Yeah so it’s gotten put down so now there is somebody who is an hourly individual who is working as an inventory control specialist who is now interacting with a computer. So that job has evolved.

The same company’s customer service group formerly managed everything on spreadsheets and now they are able to use these applications. They describe the change as, “I see that as it’s clearly revolutionary—I hesitate to use the word ‘blue collar’ where jobs that were more manufacturing or more rudimentary have evolved into using more technology. The technology is automated and has added efficiency to these jobs.”

Even retail organization have computer processing which are more management-oriented positions. They are required to have the ability because those large distributions companies like the GAP have to process correspondences such as e-mail and inventory systems.

The technology company actively collaborates with an organization called The Technology Advocates of San Antonio (TASA), which is an organization that is non-profit program for individuals interested in technology to communicate about technology. The organization invites community members or anyone that is interested to visit. Technology is the underlying theme. There is a large group of people who were interested in finding out what was going on at various companies within San Antonio. They also teach about technical issues such as implementation of wireless and possible problems when using and installing the equipment. The biggest part of business involvement is to act as an ambassador to find out what is going on in San Antonio.

## **Conclusions**

Business involvement sometimes includes funding for technology equipment, but more importantly, it provides the supportive mechanisms for maintaining and providing a community foundation for the schools. The involvement, however, goes only as far as the areas that the businesses would benefit. They do not involve themselves in the core subjects such as social studies and science. The notion that English and science skills can be included in a systemic and well-rounded education and transferable to workplace skills is not realized. Ironically, the very entity that will absorb the students as they finish their educational experience does not contribute to the framing of an education that will support business growth. Many businesses go as far as to deny that there is a dependent relationship between the two organizations. Expectations from business people, however, show that even though there is little

involvement, the future employee must acquire high level skills and in particular, the right skills to support their business goals. How can schools provide this kind of real-life training without constant and sustained involvement from business sectors? Meanwhile, businesses declare that employees are coming to them without the skills needed to perform a job (data are further identified and categorized in Appendix G.)

## CHAPTER V

### **SUMMARY, FINDINGS, CONCLUSIONS, IMPLICATIONS FOR PRACTICE, AND RECOMMENDATIONS FOR FURTHER STUDY**

This chapter includes a summary of the study and findings for each research question. There is a discussion section that explores the connections that exist for subunits of the research questions, methodologies, review of literature, analysis of data, findings, and conclusions. In addition, this chapter includes implications for practice and recommendations for further study.

#### **Summary**

The purpose of this study is to determine and examine business and educational leaders' perceptions of necessary technology competencies of high school students in different socioeconomic and geographic areas in selected schools and businesses in San Antonio Texas. Examination of the business perceptions and interaction with the schools directly relates to the employment skills that are being taught and offered in high schools. In addition, employment skills are also related to the availability of technology for students and to a teacher's ability to use technology through training opportunities. Because of the increasing demand for computer technology-oriented workers, businesses believe that schools should teach students to meet the criteria for employment set forth by these businesses. In many cases, however, businesses only participate in schools where the students show the most promise.

As requirements for basic employment rise in the workplace, school and business expectations increase for segments of society that have the means for acquiring the necessary skills for future employment. Furthermore, the increase in requirements for necessary skills involves an increasingly larger amount of technological skills. This means that for students and graduating students entering into careers, it is more difficult to acquire and have proficiency in all of these skills. This is due to the growing gap between the capabilities and opportunities for high school students to develop the technology skills and knowledge required by the employees.

Many different factors have helped to support the growth of technology in situations. One such factor is technology funding, which supports primarily higher socioeconomic areas, leaving lower socioeconomic school districts with significant barriers. Texas implemented legislation that is supposed to help support and equalize the distribution of property taxes from wealthy to underprivileged school districts (known as Robin Hood legislation). Texas government does not, however, control the large bond support that brings in thousands of dollars in affluent areas. Bond monies are not evenly distributed; rather, the money stays in the area in which the bonds have been proposed and passed. Bond issues in poor school districts often fail to pass because of an areas' inability to pay higher taxes. This undermines the growth of technology in lower socioeconomic areas which, in effect, lowers the opportunities for technology access and competency in students.

The research questions I used were:

1. To what extent do businesses in San Antonio, Texas contribute to technology competencies in selected San Antonio schools?
2. To what extent do businesses influence San Antonio, Texas high school technology curriculums as perceived by teachers, administrators, and business leaders?
3. To what extent do business and school leaders' expectations of technology competencies of high school students in selected high schools decline because of lower socioeconomic conditions and geographic areas in San Antonio, Texas?
4. To what extent do administrators and teachers perceive the importance of technology competencies for selected high school students for future employment?

I conducted the interviews in a natural setting. Inquiry was carried out face-to-face in the administrators', teachers' and the business leaders' work place. This way I could observe how they behaved in a comfortable setting rather than an unfamiliar environment.

My goal was to acquire a comprehensive understanding of the perceptions and thoughts of business leaders and teachers.

This study included four school districts in San Antonio, Texas. Two of the 4 schools were located in southern San Antonio and were classified as being located in a lower socioeconomic area. The other two schools are located in northern San Antonio and were classified as being located in a higher socioeconomic area.

Twenty-one interviews were conducted with administrators and teachers and seven interviews were conducted with business people. Teachers and administrators were asked questions from a prepared questionnaire. They were however, allowed to expand their answers in order to elaborate. Questions were related to business partnerships and/or involvement, student and teacher access to technology teacher training, and student skill-level difference by socio-economic areas. I had prepared questions in advance to guide, not restrict the interview.

The seven business interviews were from the (1) grocery; (2) San Antonio city government; (3) military; (4) large retail chain; (5) technology organization and business; (6) telecommunications; (7) youth-oriented organization. The business leaders were also asked questions in their natural setting. I had prepared questions in advance to guide, not restrict the interview.

## **Findings**

### *Research Question #1*

Research question #1 asked, “To what extent do businesses in San Antonio, Texas contribute to technology competencies in selected schools in San Antonio Texas?”

Few businesses in San Antonio, Texas contribute to technology competencies in San Antonio A, B and X, Y schools. The only way businesses contribute or participate with the schools for this study is through established business classes (all schools) and internships. The students hired for these internships were chosen because they had already developed technology competencies. Schools A and B had students of interest to businesses because of their high exposure and access to

technology and the integration of technology in their classroom. Actual contact with the business community was limited to the district area because many parents owned businesses in the area where their children attended school.

Teachers and administrators from schools A and B said that many, if not all, of their students had access to technology at home as well. Direct influence and contact regarding technology competencies were not limited to perimeter issues such as offering employment when students had acquired high competencies. This was due, in part, because there was a high level of access at home and at school students had the ability to easily develop their competencies without the teachers' expertise.

Students from school A and B not only benefited from home access to technology, but also from their teachers' training and expertise they were able to implement in the classroom. In comparison, students from schools X and Y had a lower level of access to technology at home. In addition, these students had no contact with businesses outside of the business and technology classes and even in these environments the contact was minimal and sporadic. Teachers were left on their own to cultivate any type of involvement through contacting the businesses and acquiring employment for the students themselves without assistance. Without the energy and commitment of a few teachers, there would be no contact with the businesses. Businesses did not become involved in curriculum development or help the mentor students who needed role models from the business world.

Schools A and B had businesses contribute to the wiring of their schools. The businesses also contributed through ongoing discounts for equipment. Direct contact with the teachers who taught core content areas, curriculum issues, or technology

applications were not an area the business people felt comfortable contributing to on a regular basis. One of the business people stated that it should be left to the professional to figure out.

Students from schools A and B, however, were allowed to spend a school day shadowing businesses located in their school area so they would have knowledge of what was required in the workplace on a normal day. Businesses came to the schools to recruit applicants for summer work and internships. Involvement, however, did not include contributing to building technology competencies through curriculum involvement or participation in technology application or equipment.

Businesses contributed to all the schools by presenting motivational speeches. Teachers from schools X and Y felt annoyed by this because it was what they called “a drive by.” Often, the people who visited were former students who wanted to “give back.” Administrators and teachers from schools X and Y repeatedly expressed their discontent with businesses and the community for their lack of involvement with the students. The teachers expressed a desire to have contributions in the development of technology competencies and curriculum issues that would facilitate the process, such as mentorship/partnership arrangements, which are long-term and create lasting connections. Schools A and B did not have the same resentment because of the incredible availability of resources and support from the community, parents, and businesses. Mentoring programs that addressed long-term involvement and support for students already existed.

Interviewees from the schools saw the differences in contributions by businesses as a proximity issue. Schools A and B were located (1) in the heart of a prestigious

city within the city of San Antonio and (2) an area that is newly developed and the number one most favorable place to live. The two schools are considered to be the best in San Antonio. Businesses are involved because these schools are part of their clientele. The parents work in the area and want their schools to reflect success. Schools X and Y were removed from the central location which meant that businesses would have a longer drive from their work to the school. Most of the businesses located in the area are service oriented and small businesses. Many of the businesses in the schools area exist in isolation, much like the school, and do not understand how their involvement could make a difference. In both cases, corporate businesses and their participation with the school would mean time off work and, in some cases, a loss of revenue.

*Conclusions.* This does not represent equality in schools. The south side schools had significantly less access for students, teachers, and administrators and fewer training opportunities for teachers. Businesses do not contribute because they do not believe it is their responsibility, yet they complain about the lack of qualifications held by employees. Despite the fact that everyone I interviewed see technology as a vital skill that students will need to ensure a stable global economy, businesses do not mentor their future employees unless they live in an affluent area.

San Antonio business leaders do not contribute to technology competencies. There is no significant change in how students, teachers, or administrators use technology because of their involvement. Within the perimeters of the study, there were no contributions by businesses to assure there was sufficient access to technology equipment for school X and Y. Furthermore, there was no facilitation of

building technology competencies for students or teachers. Schools that have a high minority population and lower-socio economic status (schools X and Y) have little access or support for cultivating student competencies. Data showed that businesses depend on schools to prepare students as potential employees for either a higher education or employment positions that require technology competencies. There is a deep disconnect between businesses and schools X and Y. There is a lack of communication and involvement by the community and businesses even though these are the schools in most need of professional guidance and contribution.

In addition, access to technology resources was extremely limited in schools X and Y, which directly influences teachers' ability to integrate technology into the curriculum. Students have limited access in order to build their technology competencies. In comparison, students at schools A and B had an abundance of resources and access to technology.

Leaders of the businesses throughout the city do not contribute toward helping students acquire the technology competencies or in assisting teachers address the access of technology so they can transfer the skills to the students. Because of this lack of support, teachers in the southern area had lost faith in the education system.

### *Research Question #2*

Research question #2 asked, "To what extent do businesses influence high school technology curriculums in San Antonio, Texas as perceived by teachers, administrators, and business leaders?"

*Findings.* Every teacher and administrator from schools X and Y who participated in this study stated that business people did not want to contribute to areas outside of the business oriented classes because they could not see the relevancy of their influence in content areas such as English, Math, Science and Social Studies. Teachers and administrators expressed discontent that business people could not see the connection between writing, reading, and decision-making at a business level. This was also expressed by the teachers in schools A and B. These businesses, however, did offer exposure to students when they employed them in their businesses.

All teachers and administrators who were involved in the study stated that there was no business involvement at the school level when revising and shaping the core curriculum. The only exception was within schools A and B when there was a business recruiting effort that was based on the marketing of part-time employment opportunities. The businesses explained that they did not see how content areas contributed to technology competencies and felt they should leave this type of learning experiences to professional teachers. In addition, they did not believe they had anything to contribute to framing the curriculum in K-12 education. The business people expressed that they felt too far removed from the high school experience to remember what it entailed, even though they eventually would be the recipients of the employees who were educated in the public school system. In comparison, the content teachers did see the value of having business people involved because they saw the value of what they could bring to the classroom and the instructional curriculum. Every teacher and administrator involved in this study felt that it was imperative for students to understand why it was important that they learn how to

read and write and what the consequences would be if they were not prepared for the after-school experience.

Schools A and B expressed a connection with business that was based on a vendor relationship and the selling and servicing of technology equipment. After the selling of equipment there was no follow-up with training or curriculum applications. The district offered district and school wide training, so there was not an expressed need for businesses to be advisors or contributors to a curriculum. Community members do not contribute to curriculum development in any of the districts.

Business leaders do not know how to help schools within the context of the core curriculum. They do not see the relationships or relevancy that exists for example between math and business applications. The same holds true for English literature and the relevancy with business practices. Businesses do not recognize where they can contribute, yet they expect a high level of skills, including technology. They view this aspect of education as one that should be left to the professionals.

*Conclusions.* Selected businesses in San Antonio are not involved in the development of technology curriculum in the selected schools. The fact that two of the higher socioeconomic school districts offered internships is dependent on a strong curriculum that has been successfully implemented and facilitated by teachers and/or administrators. Of the schools included in the study, there is no recognition that business practices are even remotely connected to curriculum core subjects or future workplace aptitudes within the high schools in San Antonio, Texas.

*Research Question #3*

Research question #3 asked, “To what extent do business and school leaders’ expectations of technology competencies of high school students in selected high schools decline because of lower socioeconomic conditions and geographic areas in San Antonio, Texas?”

*Findings.* The southerly located schools are very influenced by where they are located in San Antonio. For the majority of the businesses in downtown and northwest San Antonio, reaching the school would require a long drive. In addition, there is a stigma attached to south San Antonio because it is economically challenged. Even a city employee expressed that getting involved in rural and a lower socioeconomic area is not a priority from an economic standpoint for potential businesses that could locate in San Antonio. They expressed that they do not emphasize growth and academics in the southern part of San Antonio because there are fewer people with the skills and qualifications for employment. In addition, the employees in the south are service-oriented and smaller privately owned businesses. The city employee also stated that, due to future population growth, the city will have to attempt to repair south San Antonio’s economy. This will be an initiative that involves many different business sectors within San Antonio; however, the city’s interests are mostly about product distribution. For example, one of the business leaders described a developer in San Antonio who had purchased land a few years ago in hopes of building subdivisions on the south side. The developer felt that that first there must be an intense effort to improve the schools so families would not worry about their children’s education. South San Antonio’s test scores were the

lowest in the city so the developer pledged to give the district anything they needed to help the scores improve. Again, this represents a short-term fix to a long-term problem, involving many things that are beyond throwing money as a quick solution. Overall, businesses did not get involved in a way to engage and mentor students from lower socioeconomic areas that would have long term benefits.

Budgets for school A and school B are different with respect to the total student populations. The expenditures per student remain at approximately \$7,000 per student. School A and school B are located in an area of San Antonio where the property tax rate is higher. Logically, the schools located in the higher property values would have the budget advantages for developing technology in these schools.

With further comparison, the same logic for school X and school Y does not apply. Schools X and Y have different budgets with respect to the total student population, and the expenditures per students remain at approximately \$7,000 per student. Schools X and Y are located in an area of San Antonio where the property tax base is low. The budgets for school X and school Y are supplemented with additional funds by the Robin Hood Act which redistributes funds as an effort to maximize resources. Ironically, the poorer school districts have the same budget allocations; however, disadvantages lay within the funding opportunities that are made available from other funding sources outside the tax revenue and state contributions. School bonds with technology infused within these packages have a better chance of surviving in an area of the city where the property tax base and the economy is more stable within a community.

An additional funding source, outside of the school tax revenue and state contributions, is the availability of technology grants. These grants requirements include high need, lower economic areas (LEA) or low performing schools, but a key requirement is partnerships. Partnerships score higher on grant applications because they are designed to reach more schools with fewer dollars. More affluent school districts are in a better position to have a grant writer on staff and have the experience to acquire grants that include low performing schools or high need LEAs.

Furthering this technological gap between schools X and Y and schools A and B, schools A and B have very developed multimedia classes with the most current software programs. One of the teachers explained that the teachers have trained the students at such a high level that they have actually acquired employment based on their extensive exposure to the software and technology.

*Conclusions.* In viewing the availability of technology and schools, there was an extreme difference between the north (high socioeconomic and predominately white) and south (predominately minorities and lower socioeconomic) so much that the data indicated inequity and a disproportionate availability of resources available in the schools researched in southern San Antonio. The imbalance will directly impact the students' competency level when trying to secure employment in the future. The students are directly affected by the geographic area in which they live and the established system of state funding that is established in those areas. These systems directly influence an ongoing system for inequality in these areas and will directly impact the economic prosperity and future employment opportunities for our upcoming contributors to the employment pool.

Businesses and the city official in San Antonio do not focus on the schools located outside of the prominent, higher economic, and affluent school districts. Businesses do not perceive the southern area as giving them a high rate of return in their investment or an area that would cultivate future customers. The divisions are felt by teachers and students. Students who relocated from southern to northern San Antonio had difficulty adjusting. Teachers are not able to collaborate with teachers in the north, as they were considered less intelligent and ill-prepared to be teachers. Even with these stereotypes in place for all the schools, many of the same issues were present, such as technology on-demand availability, time consuming professional development, and lack of support at the district level.

Access to key technology resources lead to expectations, whether high or low, for the students. The access issue continues to be a problem and acts as a separator for high-poverty, high minority, and academically failing schools.

#### *Research Question #4*

Research question #4 asked, “To what extent do administrators and teachers perceive the importance of technology competencies for selected high school students for future employment?”

*Findings.* Businesses that claim they do not require much or any technology skills from future employees do, in fact, have expectations for the current and future high school graduates, even though this is not always expressed during the interviews. For example, while these businesses may not require high tech skills, they do want employees to have the ability to do simple tasks on the computer. It is important to

know that these skills have become so deeply embedded in society that isolating them as a need is no longer a normal process. People have internalized technology as being stable day-to-day exposure.

Society has been exposed to technology in greater depths today, as compared to 10 years ago. For example, if a high school graduate without any computer skills who graduated 10 years ago were placed today, the graduate would find it difficult or impossible to comprehend the existing technology in place. Even today's high school graduate has been exposed to this type of technology at minimal levels.

Every teacher in all four districts expressed concern about the longevity of computers. Technology is changing at such a high rate that equipment becomes obsolete in a matter of months, which is not preparing the students for employment in a business environment that is undergoing constant technological growth. If a resource loses usability in two years, there is a question whether this is the best place for funding. Are funds better used for new textbooks when a student are using books that are over 10 years old, or is the money better spent on new computers? A teacher from schools X and Y expressed the fact that, "we know you can not have both, but in this case, we do not have either."

Teachers had a unanimously high level of understanding about the importance of technology competencies for students. Teachers and administrators must have a well organized and fluid technology training program that will help to integrate technology into the curriculum and a more direct response to competency development. School A and B had achieved this level of training; however, schools X and Y did not.

*Conclusions.* Technology competencies are important; however, business people do not realize that their paradigm, the change of technology availability in the workplace has become so deeply embedded from constant contact that they do not consider how it is used or how they have become the extreme dependencies in the workplace. One-hundred percent of the business people who were interviewed stated that, when faced with a candidate who has technology skills and a candidate who does not, the candidate with technology skills will acquire the job. At the same time the same people stated that they train people once they are hired to use their particular technology. This is an unconscious expectation in businesses, yet teachers live with the responsibility of molding students so they will be prepared for a life where they can support and secure employment for themselves.

Teachers and administrators are extremely aware of the implications of technology. They are often overwhelmed with what must be done and back away at times from using technology because of standardized testing. No Child Left Behind legislation has a detrimental effect of students acquiring technology skills. Schools are fearful of scores and coverage of the curriculum and unanimously agree that integrating technology into the curriculum takes more planning and slows down the scope and sequence of the curriculum.

Even though all teachers and administrators in schools A and B agree that the use of technology is important, schools X and Y are very unhappy with the lack of support they receive in training and technology access. This attitude directly impedes the embracing of technology in the classroom and acts as a barrier for the growth of student technology competencies. In essence, they have given up and feel they hit a

brick wall whenever they ask for anything. They feel that the administration does not support their efforts and the community ignores them.

### **Implications for Practice**

The results from this study suggest several important implications. The results illustrated that there is very little participation with businesses and the community in assisting schools in developing technology competencies. In addition, there is an enormous difference in the northern and southern high schools selected for this research. The implication is that the students on the south side of San Antonio will not have the technology competencies that will impact their search for employment. The impact of not having community and parental involvement is very evident in the southern schools which also impedes the integration of technology and support in acquiring technology resources.

### **Recommendations**

#### *For Practice*

If districts are going to invest large amounts of money into technology equipment, they must have the people to fix the equipment when they have problems. Schools X and Y have limited access to technology and had no mechanism in place to repair, update, install, or trouble shoot an ongoing program for technology.

For students to have technological skills they must first have access to the technology. In order for students to practice and integrate technology into their educational experience, they must have teachers who are well trained in the use of

technology. This type of structure requires extensive funding and participation from all stakeholders. All funding avenues must be sought after and training must be a parallel activity. Grants must be considered in order to maintain and increase access to technology in all schools.

All four districts need to invest in a tool for assessing technology competencies so training will be relevant for both students and teachers. This will help the schools develop a training plan that will address all levels of competencies. In addition, the teachers and students must administer a survey to identify how to integrate technology effectively for the purpose of developing a training plan.

Teachers from schools X and Y need technology training and then the development of a sharing model. Schools X and Y must develop a peer coaching program so that their technology and training funds will be used efficiently.

Another approach would be to pair a school that does not have a high level of experience with technology with another school that has gone through all of the obstacles while implementing. The two schools could act as co-mentors for various programs that would serve both schools. This could also be shared with business partnerships to increase business involvement. Curriculum panels could dissolve the barriers between school districts. This could also extend to involve diverse businesses partnerships.

Involvement between community and businesses, despite their locations, must increase. Schools must ensure that students, teachers, and parents understand the importance and vitality of technology integration. The schools must produce an environment that embraces and places a priority on processes for technology growth

and integration into the teaching and learning process. Research shows that student achievement is evaluated (40%) because of school partnerships. This evaluation does play a part in the employment of entry-level personnel (47.5%). Also, there is a relationship between the company's business objectives and its school partnership involvement (47.5%). Evidence suggests that certain companies may increasingly be sensitive to the need to invest in and measure the results of their school partnership investments (Bainbridge & Sundre, 1991). Therefore, there must be a formal design for aligning communities, educational agencies, and businesses to address funding and the design of training programs and the development of student competencies in technology. Students should not be excluded from this process. The process should include the development of a vision, goals, and training that leads to the development of a systemic approach to a “whole” education for students. The program must be developed to meet the unique needs of the community while all stakeholders acquire ownership for implementing and sustaining the program.

All schools should begin a training program for parents so that they will be involved in the technology of the schools. Furthermore, they should involve the business people in the areas so that their skills can also be developed. This involves the community and businesses in the fulfillment of grants. This support would help all the schools expand and upgrade their access to technology and will help address the barriers that currently exist for implementing a technology program built on a secure foundation.

Schools A and B need to participate in alternate funding opportunities. The schools must develop a model for maintaining technology equipment and a training

model for integrating technology. This plan should be presented to the district in order to gain support

*For Further Study*

The following is a list of suggestions that future researchers might pursue along a line of inquiry.

1. Additional studies on other schools that are having technology funding and problems (for example, maintenance of equipment and sustaining up-to-date equipment).
2. Future studies regarding the funding of public education at the federal, state, and district level, and the affect on areas that have difficulty acquiring and securing bonds in lower socioeconomic areas.
3. Further collection of data and analysis regarding the impact of business involvement in technology implementation and curriculum development in high schools.
4. Impact of how equity and access affects the learning process and ability to succeed in college and/or the workplace.
5. Research the connections between low parental and community involvement in lower socio-economic areas because of the parents' education level and how this impacts the schools.
6. Follow-up studies should be done to determine if the availability of technology affects a students competencies and how access of technology to teachers directly affect those competencies.

7. Further studies should be conducted to determine if more a more systemic view of a city's students, rather than focusing on divisions and barriers by location and socioeconomic class.
8. A study should be conducted to review the reasons that businesses do not feel comfortable about advising in content areas. Business people in this study said that they felt disconnected with public schools and that the process of education should be left to the professionals. Research should be conducted to determine areas where businesses can begin the process of involvement on schools.

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**APPENDIX A****CONSENT FORM FOR EDUCATION AND BUSINESS LEADERS**

**Research Title: Comparative Study of Social Economic Differences in Relation to Technology Competency Expectations as Perceived By Business and Education Leader.**

I \_\_\_\_\_ understand the purpose of this case study is to compare social economic differences in relation to technology competency expectations. I understand that this information will be used for examining the expectations of business leaders and education leaders in San Antonio, Texas. The research interviews are being conducted to satisfy the requirements for completion of a dissertation and doctorate requirements at Texas A&M University. I understand that the research will be conducted under the supervision of Dr. Kenneth Paprock at Texas A&M University, College Station, Texas. I understand that the interview will take around 30-45 minutes to complete. I have been informed that there will be thirty-five subjects participating in the case study. The date of the study begins July, 2004 and commences November, 2004. I am aware that the proposed case study will be conducted in an interviewer/interviewee format. I understand that all answers are voluntary and confidential. Without penalty, I will inform the researcher if any questions are uncomfortable and need to be omitted from the study. I understand that participation is voluntary and that I can withdraw from the study at any time. I have been told that the interview is confidential. I understand that it is necessary to audio tape the information for ensuring accurate collection of data. I have been told that the tapes will be stored in a safe, locked place by the researcher and will be destroyed

after 3 years. No risks or discomforts are anticipated. I understand that this research study has been reviewed and approved by the Institutional Review Board-Human Subjects in Research, Texas A &M University. For research-related problems or questions regarding subjects' rights, I can contact the Institutional Review Board through Dr. Michael W. Buckley, Director of Support Services. Office of Vice President of Research at (979) 458-4067 [mwbuckley@tamu.edu](mailto:mwbuckley@tamu.edu).

I have read and understand the explanation provided to me. I have had all my questions answered to my satisfaction, and I voluntarily agreed to participate in this study. I have been given a copy of this consent form.

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Signature of Subject

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Date

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Article IV. Signature of Principal Investigator

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Date

Contact information:  
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## APPENDIX B

### LETTER TO SUPERINTENDENTS

Dear XXXX (*Superintendent*),

I am a doctoral student at Texas A&M University of College Station, Texas. As part of my doctoral program, I am conducting a comparative study that addresses social economic differences in relation to technology competencies expectations and perceptions of education leaders and business leaders in San Antonio, Texas. Results of this study are expected to provide valuable understanding about technology and skill preparation in our San Antonio high schools.

I am requesting your participation which will involve interviews with Administrators, Principals, and teachers. The high school I am interested in working with is XXXXX.

Participation in the study is voluntary. No risks or additional effects are likely to result from participation in the study. All data collected in the study will remain confidential. The analysis of the data will be coded in a summarized form with no names included.

I would like to begin this study as soon as possible, so if you could please sign this letter and fax to Janice Reyna at fax number 210.8416235 I would be much appreciative. Thank you and I look forward to interviewing your district staff. You can email me at jreyna@ets.org if you have any questions.

By signing this form, you will be giving Janice M. Reyna permission to conduct interviews at XXXXXXXX with the school staff. Thank you so much.

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XXXXXXXXXXXXXXXXXXXXXXXXXX

I would so much appreciate your help with this project.

Sincerely,

Janice M. Reyna

**APPENDIX C**  
**QUESTIONS FOR SCHOOL LEADERS**

**Questions for School Leaders**

1. Do you have any partnerships with businesses in San Antonio who advise and contribute to technology skills or technology access?
2. Do you believe there are geographic differences in technology skills of graduates/students and their level of technology skills depending on where they attend public school?
3. What kinds of technology competencies do you incorporate into the schools curriculum?
4. How important do you feel it is for students to leave their formal education with technology skills and competencies?
5. What kinds of technology based resources have been made available for your use?
6. What type of support do you receive from business partnerships and the community?
7. Do businesses provide input regarding skills, curriculum, and technology competencies for students at your school?
8. Do you feel you have adequate technology skills so technology based lessons can be incorporated into the classroom?
9. Does your district support technology skills with adequate resources for student use?

10. Have you ever attended a business sponsored seminar?

## APPENDIX D

### INTERVIEW QUESTIONS FOR BUSINESS LEADERS

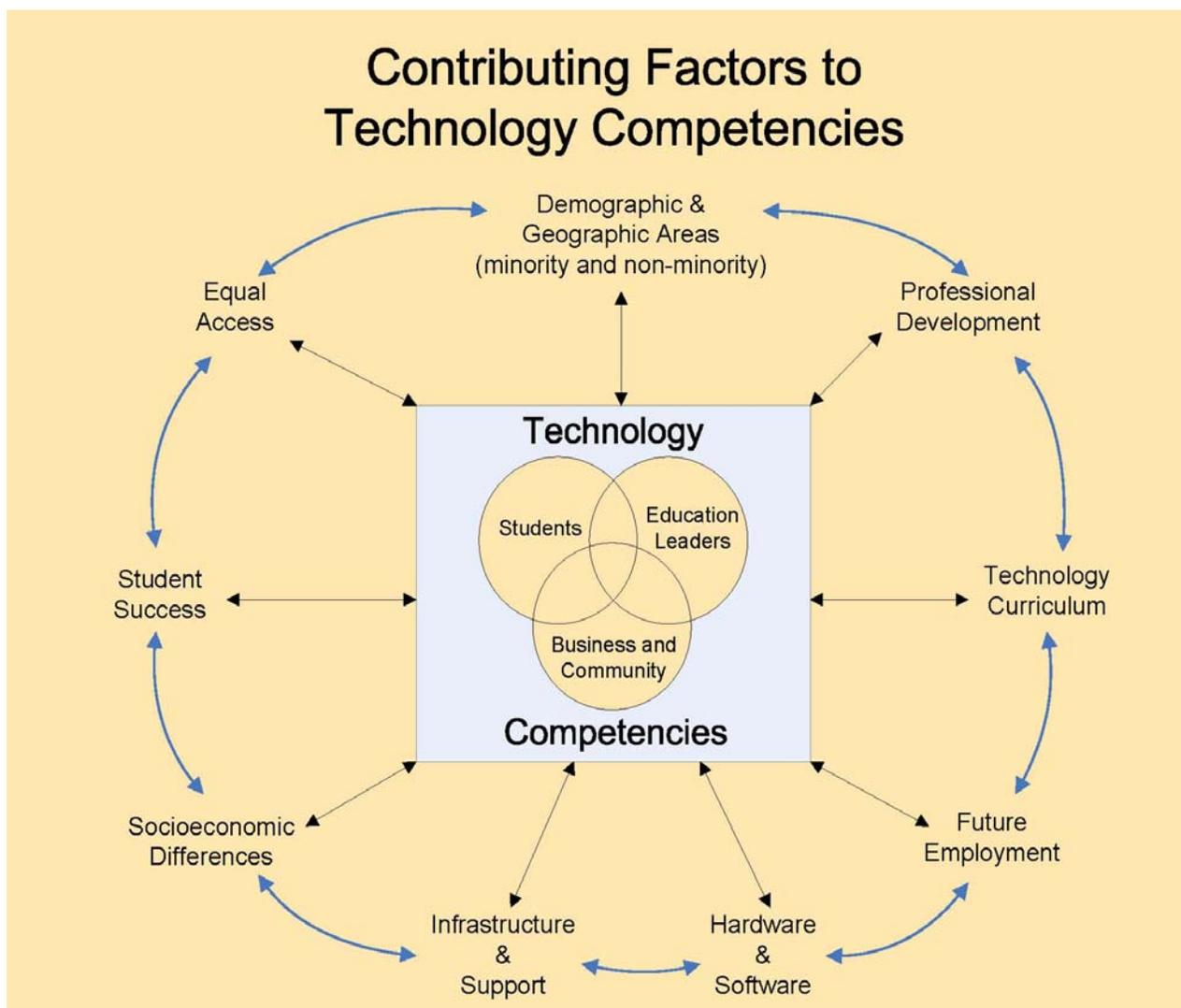
#### Interview Questions for Business Leaders

1. Is your business dependent on people who come to you with technology skills and competencies?
2. Does your organization participate in structuring curriculum with schools? Why or why not? Does your business help schools and students build technology competencies?
3. Does your business or work place have any existing partnerships with schools in San Antonio, Texas? Do they help schools and students develop technology competencies?
4. How long has your business existed? Do you see a change in the use of technology? How important do you think it is to have technology competencies in the business world?
5. How many high school students have been employed at your place of business or are currently employed?
6. Do you hire people who have not completed a high school education? If you do hire people who have not graduated, what skills do you require?
7. What types of technology skills do you require at your workplace?

8. If an applicant does not have the required technology skills to gain employment but has other valuable attributes, what criteria do you use to make the decision to hire or not hire the individual?
9. Do you have an established training program for the people you work with or for newly hired people?
10. When people are hired do you see any geographical differences in technology competencies or differences because of the public school they attended?

## APPENDIX E

## CONTRIBUTING FACTORS TO TECHNOLOGY COMPETENCIES



**APPENDIX F**

**DATA CHART FOR SCHOOLS**

**A, B, X, AND Y IN**

**SAN ANTONIO, TEXAS**

<b>Access to technology at home and school by demographic and geographic location in San Antonio, Texas</b>		
<b>School</b>	<b>Percentage of Respondents</b>	<b>Analysis of Data</b>
School X	100%	Teachers and students did not have adequate access or equipment was non-operational, as one teacher said, "No one is able to fix it, so the equipment sits and collects dust."
	50%	Teachers and administrator state that the technology they have is obsolete.
School Y	100%	Teachers and the administrator described the inequality in access to technology as the "the digital divide" which directly affects technology competencies nor had resources to teach with.
School A	80%	The school was considered to have high technology access (showcase for the city); however one teacher felt there were not enough projectors.
School B	100%	Extremely high access: technology training facility for teachers' use in the school; every student had access to computers; parents and community members were provided access; and teachers did not know of any student that access to technology at home. Access is satisfied in the teacher's rooms, computer labs, library and portable wireless labs.
<b>Teacher competencies and professional development opportunities</b>		
<b>School</b>	<b>Percentage of Respondents</b>	<b>Analysis of Data</b>
School X	75%	Teachers expressed that they did not get the support they needed for any kind of training or growth professionally.
	50%	Of teachers said that even if they had adequate technology, they would not know how to use it. They also stated that during training they could not keep up.
School Y	50%	Teachers felt they had been adequately trained and their skill level is high enough to utilize the limited equipment in their school. Of that, half felt they were not integrating computer use into the content correctly
School A	100%	Professional development revolves around the use of technology in the classroom to increase teacher competencies.
School B	100%	Teachers feel confident about their technology competencies-professional development is described as extreme and training is always available. An administrator states that teachers are disgruntled because they are having to go through training that is overdone and time consuming.

<b>Student Learning and technology competencies for future success</b>		
<b>School</b>	<b>Percentage of Respondents</b>	<b>Analysis of Data</b>
School X	100%	Every teacher and administrator felt that students must have technology competencies to be successful and to secure employment after graduation. A teacher stated, "If technology access is considered to be the key for providing competencies to be successful in a competitive world marketplace, these students will not be prepared to compete."
School Y	100%	Every teacher and administrator discussed students and their concerns regarding opportunities that students may or may not have in the future. "Students are amazingly knowledgeable, but they are not getting their technology competencies at this school," a teacher reported.
	100%	Teachers felt as if they need to lecture in order to cover content because of NCLB and the risks of not covering the curriculum.
School A	100%	All of the teachers know what students need when addressing technology competencies. They are in touch with what students will need in the next 10 years. Success is a non-negotiable – for all students.
School B	100%	"You would not believe what is happening here [with technology] right now. All the way from the 1 <sup>st</sup> grade to the 12 <sup>th</sup> grade, one administrator expressed. Students are groomed and indoctrinated and know they will succeed.
<b>Demographical, socioeconomic and geographical differences in San Antonio, Texas</b>		
<b>School</b>	<b>Percentage of Respondents</b>	<b>Analysis of Data</b>
School X	100%	Expressed feelings of being isolated from other schools within San Antonio.
	75%	When asked about geographical differences, teachers expressed that they felt people looked down on them because they were from the southern part of San Antonio, especially when attending professional development outside their region.
School Y	100%	Teachers feel they are isolated, ignored and underachieve with a stigma (uneducated, illiterate, poor) attached because they are from the south of San Antonio. It was rare that students transferred from the north to the south unless they had been kicked out of their school.
School A	75%	Addressed the question about computer abilities and the differences in skill levels when students come from other areas schools. They felt that there were significant differences in computer skills geographically in San Antonio. An administrator commented, "it's the haves and the have nots, it's the same old pattern that you see in society."
School B	100%	The low poverty rate in this affluent neighborhood translates to success for the school. It is really dependent on the socioeconomic status of the clientele. A teacher described, "Most of the students around here have relatives in businesses they will inherit someday."

<b>Business and community participation in schools – technology competencies</b>		
<b>School</b>	<b>Percentage of Respondents</b>	<b>Analysis of Data</b>
School X	100%	There was very limited involvement with business and the community. The teachers and administrators expressed a sincere need for community and business support, along with long term and consistent involvement. Teachers and the administrator in school X expressed a desire to have businesses assist in their schools as partners.
School Y	75%	Teachers and an administrator said that they would welcome partnerships [they only had business involvement in business classes] with a business. They also stated they did not have any involvement from people in the community and they would welcome the opportunity for more community involvement.
	100%	Even though having businesses involved in school may cause a little confusion, the teachers and administrator stated they would like community support.
School A	100%	Participation is high with business partners working on advisory committees, which is getting exposure to business, marketing, and planning. An administrator stated, “We have incredible input from business and ultimately the community.”
School B	100%	Businesses and the community completely rewired their school. Administrators see the benefit of having business advisors for developing core competencies in technology, but had not yet included them. The school has high exposure because parents are involved – most parents work in the area and are very involved in all aspects of the school.
<b>Expectations of business and teacher leaders regarding technology competencies and employment</b>		
<b>School</b>	<b>Percentage of Respondents</b>	<b>Analysis of Data</b>
School X	100%	Teachers and an administrator summarized that business people and community members do not recognize the value of what they have to offer.
School Y	100%	All teachers and an administrator believe that students should have strong technology competencies. A science teacher stated that everyone is very aware of the expectations that businesses need as far as skills, “yet we, as a low socioeconomic area are very much ignored from the very beginning.”
School A	100%	Students need real world connections –to incorporate some kind of business exposure with content so they could acquire skills and relevance. A teacher reflects on the expectations of businesses stating, “In many cases, business people want an instant product investing in education, however that does not show instant results. Instead, the years of learning development must be a broad view of society.” A teacher stated repeatedly, “Every employer I work with requires students to have computer skills.”
School B		Most of the businesses in the area are owned by the parents of the students at attend the school. The expectation is for students to take over their parents business.

**APPENDIX G**  
**DATA FOR BUSINESS LEADERS**  
**IN SAN ANTONIO, TEXAS**

<b>Business Leaders in San Antonio</b>	
<b>Business and Community Participation in Schools-Technology Competencies</b>	
<b>1 - Retail</b>	The retail chain used to participate with schools but now they leave it to the professionals, “We can trust professional educators to teach students what we need.” Their part is considered complete by paying taxes and employing young people.
<b>2 - Telemarketing</b>	This business works with schools for the purpose of recruiting new employees due to their massive turn-over rate. “We hire 300 people a week.” Job placement is a priority for this business when interacting with schools. There are no true partnerships with schools beyond recruitment because it is too time consuming and there is no desire to expand that relationship. Contribution to curriculum is non-existent. Their contribution is through “real-time” experiences. Schools have never asked for them to contribute more.
<b>3 - Military</b>	The military involve themselves in the schools as a recruiting effort. They do talk with some students in their American history class, but do not involve themselves in a long-term relationship with teachers or students. Curriculum involvement is limited to ROTC; otherwise, there is no involvement.
<b>4 - Grocery</b>	Involved with mostly elementary schools (none of the secondary south side schools were included) and help give-out awards for teaching and some curriculum initiatives.
<b>5 - City Government</b>	Involvement is an economic motive for the city. Employers will bring employees to an area that has a strong academic base. “Business people do not know what else to do [besides pouring money into it] to help schools”. They feel that educational organizations are so far behind. “We have to come together. It is all about marketing and getting businesses to come and stay here”.
<b>6 - Youth-Oriented</b>	They will work with schools to help them train students to be responsible people.
<b>7 - Technology</b>	They have partnerships with colleges and universities. They want the “smart people”.

<b>Business Leaders in San Antonio</b>	
<b>Expectations of Business and Teacher Leaders Regarding Technology Competencies</b>	
<b>1 - Retail</b>	There is not a technology skills test or questions on the application about technology competencies, yet this retailer complains about assisting employees with computers logins because young employees can not use a mouse. They stressed that responsibility, business ethics, and sales are more important in business.
<b>2 - Telemarketing</b>	Worried schools are not teaching workplace attributes such as responsibility, punctuality, and ethical practices. Workplace attributes such as these are more important than being technology savvy. Expected technology competencies are necessary to advance to a higher level. Students who come to them from the high schools are familiar with the computer and not afraid to use it. They do test these students to determine their competencies before placement.
<b>3 - Military</b>	After the recruits are in the military, they test them to place in training where they will be most successful. The military will test technology competencies before sending to a tech school. Technology competencies are not tested as basic entry into the military. "We don't require technology competencies." Technology is not seen as a critical track for training.
<b>4 - Grocery</b>	Younger groups learn technology competencies easier. Stated, "We do depend on the schools quite a bit; I mean, every school is teaching technology skills now." They do not test for technology competencies. Applicants are asked during the interviewing process if they are comfortable with using technology. Other skills were also important such as ethical behavior, teamwork, dependability and trustworthiness. Technology skills can be taught during training, but it is difficult to instill a sense of loyalty and trustworthiness.
<b>5 - City Government</b>	The city government states that education is behind in San Antonio (SA). "We don't talk about it a lot with companies because frankly, it's my job to talk about the good things about SA." They need for technology to be used and understood as a tool to develop skills that are necessary to compete. Schools are teaching students to use technology equipment, but this is not really an investment in technology. Students must have intellectual growth. Schools can not buy technology without nurturing students in content. "The computer is not used to the extent that it is being promoted."
<b>6 - Youth-Oriented</b>	A young person must be able to complete database work within 30 days or they are fired. They also want a team-player with a willingness to contribute and be flexible.
<b>7 - Technology</b>	It is hard to recruit people in the technology realm, but if you "play your cards right" you can find them at a university." One high school student came to their business to complete an internship. That student exceeded their expectations. "We didn't set them [expectations] very high...." Jobs that were blue collar are changing to technology jobs.

<b>Business Leaders in San Antonio</b>	
<b>Demographical, Socioeconomic, and Geographical Differences in Technology Competencies</b>	
<b>1 - Retail</b>	There were no differences in skill levels by area. They all expected everyone to perform “no matter where they are from.”
<b>2 - Telemarketing</b>	Declined to comment. “loaded question”
<b>3 - Military</b>	The military felt there were many differences between north and south SA with abilities and future success in the education realm. The military acts as an equalizer. It doesn’t matter where you come from. “The same opportunities are available.”
<b>4 - Grocery</b>	They did not see any differences in employees who came from different areas within SA. Training is for all employees.
<b>5 - City Government</b>	When we talk with people who may bring their company here, we talk about their needs instead of education, especially from the south side of SA.
<b>6 - Youth-Oriented</b>	Computer skills different depending where students are from in SA. We have problems with students who come from the west, east, and south side of SA.
<b>7 - Technology</b>	They did not know because they only communicate with university students.

**VITA**

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**Education**

- 2005            Doctor of Philosophy, Educational Administration and Human  
Resource Development  
Texas A&M University, College Station, Texas
- 1996            Master of Arts, Education Curriculum and Instruction  
The University of Texas at San Antonio, Texas
- 1992            Bachelor of Arts, History  
The University of Texas at San Antonio, Texas

**Experience**

- 2004 - present    Associate Director for The College Board, New York, NY
- 2003 - 2004        Education Testing Service, San Antonio, TX
- 2002 - 2003        Curriculum Coordinator SISD, San Antonio, TX
- 2001 - 2002        Instructional Design Specialist Technology SISD, San Antonio, TX
- 1991 - 2001        Master Teacher Business Careers HS, Northside ISD, San Antonio,  
TX
- 1997 - 1998        Project School Facilitator and The Mind Science Foundation  
Education
- 1993 - 1997        Master Teacher, Northside ISD, San Antonio, TX