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PREPARING STUDENTS FOR POST-SECONDARY SUCCESS:
EXPLORING THE EFFICACY OF AN INFORMATION TECHNOLOGY
CERTIFICATION PROGRAM

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DEDICATION

This dissertation is dedicated to my family who has supported me in all ways. Antonina Martyanova, Isabella Alexandra, and Maxim Conan, you are my inspiration. To my wonderful Mother, Sharon, your support and love have carried me all the years of my life.

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ABSTRACT

PREPARING STUDENTS FOR POST-SECONDARY SUCCESS: EXPLORING THE
EFFICACY OF AN INFORMATION TECHNOLOGY PROGRAM

John Lawless Lanham

Thursday, July 05, 2012

Career and Technical Education (CTE) has a long and rich history of achievement among diverse populations. Two recent events have added to the complexity of CTE. First, the accountability movement forces traditional programs to show growth and achievement with students. Accountability trends affect the content and delivery of almost all programs. Perhaps more significantly, measureable performance is increasingly becoming tied into program funding with CTE programs. Second, while CTE in general has enjoyed a long history in secondary education, an emerging subcomponent is gaining attention. Information Technology (IT) classes have been present in secondary institutions for over 30 years. Business, industry, and government organizations, however, have been actively searching for more standardized programs that deliver a full supply of highly skilled, IT capable individuals. Over 1000 IT certifications exist, many available at the secondary level (Randell & Zirkle, 2005). Traditionally, most IT training has occurred in technical and other post-secondary academic institutions. Recent pressures, however, are forcing certification requirements downward to secondary institutions. Career and college readiness standards, as well as national, state, and local accountability initiatives are influencing many aspects of high school certification programs. Little is known, however, about the short and long term effectiveness of these programs and with what populations. It is the purpose of this study to examine the primary and secondary effects of IT certification curricula on the self efficacy of a diverse sample of high school IT certification students.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter I

Introduction

The following section discusses background useful in understanding this study.

Background

Increased student achievement has been elevated to a national priority. Educational prioritizing of this kind is not new. Policy makers, administrators, and teachers have deemed educational achievement problematic for decades (Tyack & Cuban, 1995). Despite waves of education reforms, High-risk students (from this point forward, to be coined as High-risk), continue to reject much of the education process (Western, 2000). The problem of student disengagement appears to be worsening rather than improving, particularly for High-risk populations (Herivel & Wright, 2005; Moynihan, 1965; Western & Pettit, 2000). Policy represents one piece to this puzzle.

As many authors have noted, (Cuban, 1993; McDonnell & Elmore, 1987; Shannon, 2005) what may be considered a good idea by policy makers may not be well-received by those tasked with implementation. Crafting intelligent, purposeful policy remains challenging (Brown-Collier, 1998). Implementation too, proves often problematic (Brown-Collier, 1998; Fullan, 1990). Even good policy, well-crafted and implemented in good faith, will often fall to ruin due to insufficient resources or capacity (Brown-Collier, 1998; McDonnell & Elmore, 1987). Further complicating this

phenomenon are cyclical waves of reform and broken promises (Shannon, 2005; Tyack & Cuban, 1995).

Various researchers have attempted to understand the student engagement problem (Foley, 2005; Rumberger & Lamb, 2000; Rutter, 1987). Like an illness, various theories have evolved attempting to treat this national malady (Wilson, 1996). Research exploring the causes of dropout and disengagement problems remains relevant. Based upon data sets and methods choices, researchers place the current dropout rate somewhere between 25-30% (Heckman & LaFontaine, 2010). Blacks, Native Americans, and Hispanics tend to struggle more than Asians or Whites (Chen & Stevenson, 1995; Rifkin, 1995; Wilson, 1996). Males tend to be more sensitive to dropout pressures than females, regardless of race (Bernt & Keefe, 1995; Eccles & Barber, 1995; Western, 2000). The dropout rate for Black and Hispanic males is somewhere between 45-50% (Heckman & LaFontaine, 2010; Vitaro et al., 2002).

Because of recent trends in domestic production elimination and outsourcing, achieving a quality education is more relevant now than in previous decades. Factory jobs that require limited skill continue to disappear (Freidman, 2006; Rifkin, 1995; Wilson, 1996). Service industry positions have become quite competitive (Wilson, 1996). As a result, individuals with poor literacy or communication skill usually possess even weaker occupational, digital, or technical literacy (Carvin, 2000). Jobs that poor people are capable of doing continue to shrink in number (Freidman, 2006; Rifkin, 1995). As a result, cultural disengagement, detachment, and resentment by High-risk populations have been growing for decades (Moynihan, 1965; Wilson, 1996). The Civil Rights promise of inclusion has been undermined by academic, economic, and cultural

2

isolationism (Rifkin, 1995; Wilson, 1996). For the unskilled, turning to a life on the

streets has become a defacto right of passage (Herivel & Wright, 2005; Wilson, 1996).

High-risk Student Worksheet (2010)

Medical

Moeckley, 1992

Cultural

Moynihan, 1966

Economic

Friedman. 2006

Internal Character

Intelligence

Herrnstein & Murray, 1994

Social-Relational

Wilson. 1996

Institutional

Herivel & Wright, 2005
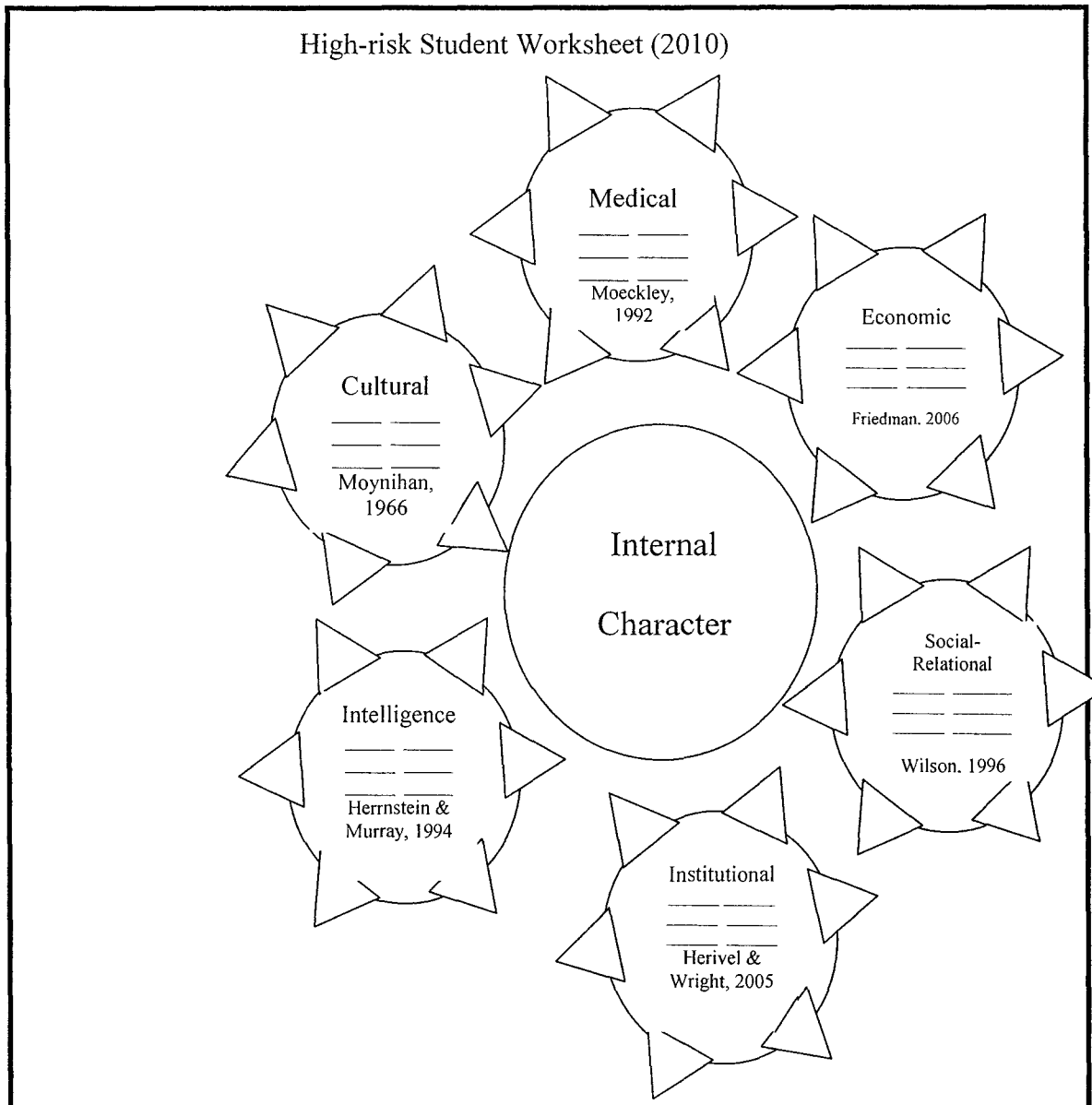
Figure 1. This figure is a useful tool in determining Risk and Opportunity Factors for adolescents. Research has indicated Risk factors can be offset by Opportunity factors. Three or more Risk factors accumulated over opportunity factors becomes highly predictive of negative life trajectory. Each of the spiked balls represents potential areas of risk and opportunity for an individual. Accumulation of risk via increased pressures will deflate adolescent internal character and result in multiplicative negative life experiences.

American prisons literally overflow with high school dropouts, most of whom are minority males (Herivel & Wright, 2005; Western, 2000).

The triple effect of weak literacy, diminished job opportunity and cultural detachment created an environment at odds with the stated goals of No Child Left Behind (NCLB). Exacerbating these conditions is the growing academic, industrial, and social prowess of the BRIC (Brazil, Russia, India, & China) economies (Friedman, 2006; Smith-Mello et al., 2008). American students are being left far behind by the academic abilities of their Indian and Asian contemporaries (Chen & Stevenson, 1995; Smith-Mello et al., 2008).

Risk and opportunity factors affect all American adolescents (Dunst, 1993; Garbarino, 1995). Once a child accrues three or more negative factors in arrears, the likelihood of transitioning into a positive life trajectory becomes improbable. As risk factors increase, High-risk individuals require a greater need for opportunity factors. The greater the negative risk imbalance, the less probable becomes successful life transition (Dunst, 1993). Certification benefits an individual in reinforcing and multiple ways. These skills may act as an insulator against socially toxic pressures.

Previous studies have examined this problem from an economic, cultural, pedagogical, organizational, and institutional point of view (Friedman, 2006; Herivel & Wright, 2005; Moynihan, 1965; Payne, 2001; Rifkin, 1995; n, 1996). Several such studies inform this work. Culture building, poverty theory, economic theory, reciprocity, and social exchange theories have made a promising start. Theory alone will not win the day; eventually, theory must be put to practice to achieve desired results.

While low-skilled individuals have often been relegated to dumbed-down coursework, (Braddock & Dawkins, Oakes, 1985) a better way of placing, and then educating High-risk individuals may exist. Much of the problem with High-risk individuals stems from the symptoms of poverty (Moynihan, 1965; Payne, 2001). Associations connecting hard work, commitment, and perseverance that lead to eventual success are notoriously difficult for the poor to conceptualize (Moynihan, 1965; Okey & Cusick, 1995; Payne, 2001). Given the opportunity, High-risk individuals may develop a connection to a life beyond their immediate grasp. Technology certification courses may offer such a bridge (Kay & Honey, 2005; Shore, 2008).

While many theories and practices hold promise of helping High-risk individuals, the reality of limited resources is always present (Payne, 2001). It is theorized that High-risk individuals have tremendous difficulty planning and ultimately, predicting and therefore succumbing to perpetual weak employment, welfare, and prison (Herivel & Wright, 2005; Moynihan, 1965; Payne, 2001; Wilson, 1996; Wolcott, 1994). Career and Technical Education (CTE) programs have a successful history of retaining, developing, and improving the opportunity factors of High-risk students (Caputo, 2003; Elliot et al., 2005). Such CTE programs, therefore, seem like a reasonable platform from which to begin this study.

Recent events, however, have rendered many traditional CTE programs unfashionable, outdated, or outright obsolete (Friedman, 2006). The Technology sub-division of CTE, on the other hand, is growing at an exponential rate (Adelman, 2000; Carvin, 2000; Friedman, 2006). Given this perception, CTE programs, particularly technology certification programs, offer concrete opportunities. More importantly,

certification attainment offers the student a marketable skill in a way that may act as a multiplicative generator of opportunity factors.

This author is aware of no studies linking High-risk individuals to IT certification programs. Such programs are fairly new to education (Shore, 2008). Various studies, however, have demonstrated three important points. First, almost all students enter into post-secondary life underprepared with weak or non-existent technical skills (Alkalia & Chajut, 2009; Kay & Honey, 2005; Sveum, 2010). Second, High-risk individuals require concrete and short-term goals to be able to justify effort (Payne, 2001). Third, IT certification programs guarantee reward for effort in very tangible and often immediate ways (Adelman, 2000). Such rewards include peer standing, certificate of proficiency, jobs, internships, scholarships, raises, and promotions. These benefits come regardless of social economic standing (SES), race, religion, geographic location, or even language (Adelman, 2000; Shore, 2008).

For the pressure-sensitive, High-risk individual, this concrete reward system may provide enough insulation or generation of opportunity factors for such individuals to transition into successful life. This study explores options that may be effective enough to divert High-risk individuals away from a life of poverty, unemployment, and institutionalization (Wolcott, 1994).

Research Problem

Reform failures continue to serve students inadequately (NCLB). In terms of current policy, clear objectives of lifelong learning, citizenship, and employment are heralded goals. We also know that schools are open systems; and, therefore, schools are susceptible to all manner of competing interests (Katz & Kahn, 1966). Certification

programs, unique to CTE, may offer a viable way for High-risk students to survive, graduate, and eventually thrive in an increasingly chaotic and competitive environment (Cairns et al., 1989; Friedman, 2006; Smith-Mello et al., 2008).

There is an ongoing conflict between Human Resource (HR) managers and Information Technology (IT) supervisors in regard to the hiring and compensation of modern IT workers (Anderson, Barrett, & Schwager, 2002). Human Resource managers value IT certifications much like the employees who hold them. Information Technology managers view certifications as less desirable than either broad-based university training or experience. Certified individuals were viewed to offer superior perceptions of credibility and hold a similar status to other professionals like doctors, lawyers, teachers or Certified Public Accountant (CPAs). As a greater number of young people forgo traditional college for technical training, it makes greater sense to develop IT certification programs in high schools (Adelman, 2000). Such programs could certainly bolster a much needed, skilled labor force. In this regard, international competition enjoys many advantages over the U.S. (Smith-Mello et al., 2008).

The research problem follows: Given the historically troubled performance of schools in developing a positive life trajectory for High-risk individuals, the educational efficacy of an Information Technology certification program requires assessment.

Research Questions

1. Are IT certification programs more efficacious than IT programs that do not offer industry certifications?

2.   Are High-risk individuals more likely to achieve success in programs

offering industry certification as compared to more traditional academic

coursework?

3.   Are IT certified individuals more likely to experience post-secondary

success than non-certified individuals?

Research Purpose

The purpose of this study is to evaluate the instructional efficacy of one

information technology certification program, particularly with High-risk individuals.

The following section provides a conceptual underpinning useful for understanding the

evaluation component of this dissertation.

The CIPP framework

The following section provides a brief explanation of the components of the

Context, Input, Process, and Product (CIPP) evaluation framework.

Elements of the CIPP Evaluation Model

This evaluation model is particularly robust in instances where the situational

context may prove relevant (Stufflebeam, 1971). Other program evaluation models are

equally useful in studying inputs, throughputs, processes, procedures, products, and

outcomes. The CIPP model, however, stands apart where context may be critical in

understanding studied phenomenon. The paragraphs below discuss the CIPP framework.

Each component-- Context, Input, Process, and Product—is its own form of evaluation.

The features of *Delineating*, *Obtaining*, and *Providing* define the vertical framework of

the CIPP model (Stufflebeam, 1971). Taken together, CIPP provides a useful tool in

informing planning, structuring, implementing, and recycling type decisions.

Context. The context evaluation proves useful in determining "strengths and weaknesses" (Stufflebeam, 1971). The evaluation should be considered ongoing. The evaluation purpose is to provide decision makers information to assist in establishment, modification, or continuation of objectives. There are three main functions of the Context evaluation. First, *Delineating* is useful in clarifying goals for the immediate and distant future. Such an evaluation should be clear about specific objectives, procedures, and programs. *Delineating* provides operational specifics useful in understanding organizational activities.

The second component of the Context section of CIPP is *Obtaining*. Data pertaining to unfulfilled needs, unrealized opportunities, and barriers are useful here (Stufflebeam, 1971). An ongoing evaluation regarding institutional achievement and program achievement are obtained and stored within this component. Current lists of met and unmet goals help to provide a useful record. Obtaining and maintaining such records aid in common funding and accreditation activities common within schools.

The final part of the Context component of CIPP is *Providing*. The activity of *Providing* refers to dissemination of collected data, reports, face-to-face communication, and modern modes of communication. While annual reports are still popular, day- to-day activities involving *Providing* may be just as important (Stufflebeam, 1971).

Input. The input evaluation holds its purpose to classify and appraise strategies for achieving program goals. An input evaluation must include personnel, adequate resources, and procedures. Input evaluation concerns itself with goal achievement via efficiency (Stufflebeam, 1971). The first component of an Input evaluation is *Delineating*. Breaking down and translating program objectives into criteria and protocol

should be done jointly with implementation personnel. A full record of these proceedings adds credibility to the evaluation.

The second component of an Input evaluation is in *Obtaining,* or gathering steps and strategies. Analysis of strengths and weaknesses in progressing toward goal fruition is critical at this stage. This step folds relevant discoveries and research into its reports and recommends pilots where appropriate (Stufflebeam, 1971).

The final step of an Input evaluation is *Providing* the findings to stakeholders in the form of a report addressing each of the contending strategies. Strategies are often complex. Benefits, therefore, are often ancillary or latent. Careful consideration and full, detailed reports provide stakeholders required structure and data during this sensitive phase (Stufflebeam, 1971).

Process. The Process evaluation is useful in providing feedback during the implementation phase of an initiative. We know from various researchers that it is in the implementation phase that most projects fail (Fullan, 1990; McDonnell & Elmore, 1987). Such evaluation allows for improvement of program design as well as a record of program actions. There are three areas of Process evaluation.

First, process *Delineation* examines each step in a procedure and tries to identify barriers, delays, and primary features. Such activity is recorded and examined. Process delineation should occur at every stage of an implementation (Stufflebeam, 1971). Focus remains on following the program design.

The second feature of a Process evaluation is *Obtaining.* Records describing the daily activities of participants, variables, and implementation of steps are the focus here. Daily notes, interviews, observation records, questionnaires, focus groups, and artifacts

are useful during this period. Participants should maintaining complete records of activities (Stufflebeam, 1971).

The final component of a Process evaluation is *Providing*. Process data should be provided to all stakeholders in such a way as to prevent barriers. Feedback can be in various forms and should be given periodically: daily, weekly, monthly. Upon the completion of a major section of the process, the evaluator should prepare a formal report identifying actual procedures and discrepancies or deviation from program designs.

Product. The final part to a CIPP evaluation is the Product evaluation. The first part of this Product evaluation is *Delineating*. The well-structured variables of product features should be examined here. Does the product or program do what it was designed to do? Clear and close adherence to product and program variables defines this part of the evaluation (Stufflebeam, 1971).

The second part of a Product evaluation is *Obtaining*. Data in the initial, interim, and final measures should be closely and accurately captured and recorded. Effort should be made to determine effect size and duration. While true experimental design is useful and popular, other methods are also fruitful (Stufflebeam, 1971).

The final component of a Product evaluation is *Providing*. Reports should be developed and provided after every major section of a program is completed. These reports may take various forms. Achievements and barriers should be reviewed in terms of program alignment and implementation (Stufflebeam, 1971). See Chapter Three below for illuminating the rationale of evaluation of the study design.

Significance of the Study

This dissertation endeavors to inform policy and practice. The social detachment problems of the 1960s are with us still today, principally among High-risk populations. Evidence indicates disengagement of ethnic sub-groups is worse than ever (Wilson, 1996). Political actors, administrators, and teachers owe a duty to all adolescents. Mandated by NCLB, educators are to discover practical, useful, purposeful, and productive methods, enabling all young people the chance to transition into a successful life. Currently, such methods do not exist, particularly with High-risk populations. Pedagogical practices that work well with affluent, middle-class, and At-risk populations are not only ineffective with High-risk groups, but outright damaging (Calkins, Guenther, Belfiore, & Lash, 2007). This dissertation is designed to test the educational efficacy of IT certification programs, predominantly with High-risk individuals. The timeliness of this study is well-matched to current economic and occupational trends.

Useful Terms

The following section defines some terms that readers may find useful in understanding this study.

1.   At-risk: Informed by Social Toxicity Theory, all American adolescents are At-risk for negative or dangerous life experiences resulting in negative life trajectory. Such life experiences may be best described as risk factors. Multiple definitions of At-risk exist (Garbarino, 1995).

2.   Automation: The process of replacing human workers with machines. Especially well suited to low skilled, repetitive work often associated with traditional manufacturing (Rifkin, 1995).

3. CTE: Career and Technical Education division is a sub-component of regular education. This academic track encourages vocational type training and often serves High-risk populations (Elliot, Foster, & Franklin, 2005).

4. Highly Reliable Organizations: Such organizations include air traffic controllers, nuclear reactor technicians, and chemical transportation companies. The precept of these organizations is that failure of any type, or to any degree is completely unacceptable. HROs have maintained phenomenal safety records (Stringfield, Reynolds, & Schaffer, 2008).

5. High-risk: Individuals that have three or more risk factors above any counterbalancing opportunity factors should be considered High-risk for a negative life trajectory including dropout activity, low earnings potential, incarceration, and such similar conditions associated with poverty (Garbarino, 1995).

6. IT Certification: Information Technology certifications are statements of competency in some IT field. Such certifications are granted by a third-party, host company or organization. IT certifications are recognized as an industry standard measure of competence and are often recognized internationally (Shore, 2008).

7. Moynihan Report: A seminal report discussing the dire condition of the American Negro family, poverty, unemployment and social detachment. Written during the height of the Johnson Era and the Civil Rights Movement, Senator Moynihan's work predicted the current state of affairs (Moynihan, 1965).

8. Outsourcing: This economic term refers to the practice of sending work outside of the US to be performed by foreign workers at a reduced cost. Such activity may be immensely profitable at the cost of American job elimination (Friedman, 2006).

9.   Policy Instruments: Theorized by McDonnell and Elmore, four instruments provide a useful platform by which to understand past and current policy decisions. These instruments are mandates, incentives, capacity-building, and system changing (McDonnell & Elmore, 1987).

10.   Reciprocity: Considered a fundamental cornerstone of human interaction and society. Many types of reciprocity exist. Reciprocity is considered an integral part of social exchange theory (Gouldner, 1960).

11.   Social Toxicity: Developed by James Garbarino, this theory states that American society cannot protect adolescents from negative, dangerous influences. This theory is built upon the work of risk adversionists. Key to this theory is the precept that risk may be countermanded by opportunity factors (Garbarino, 1995).

12.   Tracking: A practice where individuals are grouped together by perceived ability. Tracking implies very rigid standards that are not easily transgressed. Roughly 85% of American schools use some form of this practice (George, 1993).

The previous section offered a brief background relevant to the research problem and addressing a gap in existing research. The research problem, hypothesis, purpose, questions and significance were discussed. This section finished with a list of potentially useful terms.

There are five sections reviewed in the following chapter: (a) Policy & Reform Failure, (b) Current Environment, (c) Theoretical Grounding, (d) Alternative Possibilities, and (e) Literature Synthesis. Chapter Two presents a modest review of the literature relevant to the research problem, purpose and questions.

CHAPTER II

LITERATURE REVIEW

Policy has been the major vehicle for change in American Society for many decades. While methods have evolved, results are quite often very similar. The same type of thinking has filtered down into education reform and has proved equally ineffective. Misunderstanding and misuse of instrumental policy is discussed in this section. Policy in its current form cannot sustain necessary education change, particularly with High-risk individuals. A better, more efficient and hopeful alternative exists.

This Literature Review consists of related reviews that focus on the work of a single author or research team. Authors that enhance the review will be individually cited. Highly synthesized section summaries conclude this chapter. Perhaps conspicuously absent are the works of several famous researchers including Ogbu, Bourdieu and Jencks. While this author reviewed their work, and the works of many others, their research did not fit well with this author's research questions, study framework or preferences.

Research Problem

Academics and practitioners acknowledge from a varied and long history of reform failures that schools continue to fall short of adequately serving students (NCLB).

In terms of current policy, clear objectives of lifelong learning, citizenship and employment are heralded goals. We also know that schools are open systems (Katz & Kahn, 1966) and are susceptible to all manner of competing interests. Certification programs unique to CTE may offer a viable way for High-risk students to survive, graduate and eventually thrive in an increasingly chaotic and competitive environment (Cairns et al., 1989; Friedman, 2006; Smith-Mello et al., 2008). The research problem is that given the historically troubled performance of schools in developing a positive life trajectory for High-risk individuals, the educational efficacy of an Information Technology certification program requires assessment.

This conversation starts with the immense reform movements of the 1960s. Following sections include a discussion of the current policy environment, a theoretical grounding and alternative possibilities.

Policy and Reform Failure

The following section details some of the history and effectiveness of policy. Education policy should be viewed as closely linked to social welfare policies.

The Great Society and War on Poverty

The purpose of this section is to provide a critical review of the Great Society and the War on Poverty.

The Johnson legacy. Lyndon B. Johnson operated in a time of great change. Unlike many of his contemporaries, Johnson had, "conscience and political will" to take domestic issues head on (Brown-Collier, 1998). Brown-Collier suggested the effectiveness of the programs Johnson pushed through congress can be debated today; many remained hotly debated among political aficionados and academic scholars alike.

16

It was the purpose of Brown-Collier to determine what remains of the legacy of the Great Society legislation.

There were five major areas of the Great Society legislative agenda, and they included: (a) income assistance and (b) education and training. In understanding the scope of the Great Society, one can certainly see the remnants alive and well today. Brown-Collier explicated income assistance, education and training that contributed to this study (1998).

Income assistance which stemmed from the Great Society legislation took several forms. Interestingly, Johnson's legislative reforms came amidst tremendous economic expansion. The poor, however, rarely shared in such prosperity. Welfare, food stamps, aid to children and the old were all expanded under the Great Society. Such welfare programs, Brown-Collier theorized, should be considered just a piece of the Great Society movement (1998).

Education and training were bolstered by the National Defense Education Act. In response to Sputnik, the Great Society added to the education movement in many significant ways. First, Johnson sponsored Head Start and Title I. One of the premises of the Great Society held, as we do today, that there was direct correlation between earning potential and quality education. Second, Johnson further sponsored the Work Study program and Title IV of the Higher Education Act of 1965 which allowed for low interest student loans. Third, Johnson also supported Job Corp and the Economic Opportunity Act of 1964. These programs allowed for urban and rural participants to gain real-life skills via training programs previously unavailable. The great Texas reformer was a visionary who deeply felt the pain and plight of the poor. Brown-Collier painted an

17

alternative portrait of Johnson and the Great Society (1998). Was Johnson, as many critics point out, a shrewd and manipulative politician? Did he, moreover, play on the plight of those who elected him, thus unintentionally exacerbating the situation of the poor for generations to come? Brown-Collier suggested this too portrayed an accurate picture of the Great Society legislation movement.

The great paradox of examining the Johnson era was that many scholars viewed the Great Society as a failure at best and utterly damaging at worst. The argument remained that Americans remained wracked, perhaps more than ever, with poverty, failed families, crime, drugs, poor educational attainment and unemployment. Some argued that things would be a lot worse had not the Great Society legislation been implemented. It was, however, an implementation deficiency that hobbled many of Johnson's programs. His modus operandi was to get the money flowing and worry about the details later. Critics like Brown-Collier railed against such irresponsible and cavalier behavior (1998). Implementation studies clearly demonstrated the error of this type of thinking. With planning left to less powerful others, were the needs of Americans met? Did the social programs of the Great Society kill the aspirations of generations? Some critics believed so. There existed compelling research to support such a position. Where did that leave us?

The legacy of the Great Society was that we are still talking about it nearly 50 years later. Brown-Collier suggested that Johnson never intended the programs he initiated to remain static, but instead to evolve with the times (1998). Many programs did that very thing. While billions of dollars flowed into programs with roots in the Great Society, one must clearly admit that the education and training programs have evolved.

Debatable indeed were the effectiveness of the welfare programs. It seemed the Great Society fell short in terms of cohesiveness, planning and implementation. A lack of these traits was indicative of contemporary policy, too. Despite the expense, one cannot deny the boldness of Johnson's vision. The implications of the Great Society legislation permeated the past and affects present policy making. While it must be conceded that many of the reform initiatives were an outright failure, the ones that have survived did so due to flexibility.

Did we win the War on Poverty? One subcomponent of The Great Society was the War on Poverty. This particular reform movement left many Americans, particularly inner-city and High-risk individuals, in a much more depreciated position than in times prior to the 1960s. This next section illuminated policy actors' inability to make sound decisions or demonstrate flexibility by using current methods of poverty assessment. A prime example of a job half-completed was the War on Poverty (Jorgenson, 1998).

Jorgenson considered the implications of replacing household income measurements with a much truer scale of poverty: household consumption measurements (1998). Such instrumental decisions shined a more illuminating light on the real outcomes of the War of Poverty. There were two primary research questions involved in this study:

1. Did we win or lose the War on Poverty?

2. What is the best model available for detecting poverty?

The governmental standard for household poverty was set in 1963. This scale was developed based upon nutritional experts' estimates from the US Department of Agriculture. The levels were sensitive to the dietary needs relating to family size, age,

sex of head of household, as well as urban or rural geography. Other than household head status and farm versus non-farm status, the poverty threshold has remained unchanged since 1964. Infrequency of the administration of various surveys contributed to a general dearth of statistical data by which accurate measurement and prediction could be made. As a result, measuring an accurate standard of living remained elusive.

Various economic research authors informed this study. Milton Friedman's (1957) Permanent Income Hypothesis lent strength to the position that income analysis should give way to consumption analysis as a more accurate indicator of poverty. Orshansky (1965, 1966) set the poverty baseline that is still used today. Given the practice of census-based assessment models for poverty, inequality and standard of living, it remained the generally held belief that poverty was and remains nearly impossible to eliminate. Jorgenson (1998) theorized this was due to the inaccurate nature of poverty assessment. He held that examining income as a method to determine poverty is erroneous. Instead, consumption models should have been used.

Consumption offered a way of looking at household resources; cost of living scales and household equivalence indices are used to compare standards of living for different families. Income measures tend to be insensitive to fluctuation in price indices and types of households. Consumption measures take these variables into account. Jorgenson (1998) held the current model of income assessment is an insensitive and inaccurate instrument in measuring poverty.

When the failings of instrumentation were accounted for, the poverty of the pre-Johnson Era has never returned. Poverty was ranked at 22.4% in 1959. In 1989, however, poverty ended at 12.8%. Slesnick (1993) showed 1989 poverty figures based

on consumption as low as 2.2%. Further analysis demonstrated that many of the racial

beliefs people held about poverty did not hold water. Jorgensen (1998) proclaimed,

"Inequality between racial groups is a very modest proportion of total inequality and has

not changed over this period" (p. 93). On the surface, this position seemed counter-

intuitive. Such a stance flew in the face of many reformers and policy scholars. Due to

these, "highly misleading," and artificial statistics, we saw that current methods of

poverty assessment were in need of a complete rework (Jorgensen, 1998).

Jorgenson demonstrated the importance of picking the right instrument when

studying social issues. When viewing poverty (or most any other social condition), the

lens one used will define what one sees. Many experts advocated calls for yet another

rework of several major government programs. One such program was poverty

assessment relating to social welfare programs. The *War on Poverty* is still being waged.

Thanks to researchers, it appears that this battle may not be a complete loss after all. One

of the most significant scholars spent a lifetime bridging the gap between policy and

reality.

The Moynihan Report. Daniel Patrick Moynihan (1965) developed a deeper

understanding of urban poverty; and, since 1965 his work has been considered seminal.

The Negro Family: A Case for National Action proved eerily predictive. In

understanding the condition of the High-risk learner, what became known as the

Moynihan report, held no small value. In the following paragraphs, the relevant details

of this work are explored.

From inception to termination of American slavery, the Negro has been forced

into many impossible situations. Two premises underpinned the Negro condition:

Liberty and Equality. Liberty was a concept most of us are familiar with. Upon the termination of slavery, Negro America was granted Liberty. The purpose of the Civil Rights Movement and much of its surrounding legislation since *Brown v. Board of Education* (1954) was a movement toward equality. It was the equality of opportunity, status and life that rang out in the strong, clear voices of the 1960s. While inspiring sacrifices, bold changes were made. It is clear from this report that those changes signified just the beginning. Such a start usually did not elevate the Negro family out of hopeless destitution and squalor. Three hundred years of a most insidious brand of slavery appeared to have left the American Negro in dire straits.

The Negro family of the 1960s was very disjointed. By today's standards, the conditions of that period may seem mild. As the American family as a whole has undergone attack from various hardships; all demographic groups have suffered. Blights of poverty, illegitimacy, poor educational attainment, lack of opportunity and paternal abandonment were just a few of the causes (or manifestations) of Negro suffering. Maternal households dominated the Negro family. As a result, male Negro children came into the world and were raised without steady male role models, in a female dominated world, and in a world governed by welfare and social workers (also female). Disengagement from school, employment and life became commonplace. A bright spot was that Negro families that stayed together demonstrated greater resistance to dropout and delinquency than children of White families with similar SES backgrounds.

The cultural psyche of the poor Negro family necessitated a maternal family structure. Family cohesiveness was positively correlated to higher rates of economic prosperity; families with greater economic stability consistently demonstrated greater

family stability and vice-versa. The educational attainment of Negro women became and remained vastly superior to Negro men. This, in turn, led to better and more opportunity for gainful employment. This unfortunate cycle further reinforced male detachment, often starting at a young age. The benefits of education have been successfully demonstrated by various research authors. Such benefits, however, traditionally eluded Negro males as this group persistently demonstrated less ability than any other group.

Given that research detected no biological reason for this inferior performance, Moynihan suggested such low performing individuals suffered from a cultural and pathological detachment. Only in the armed forces were young men in a position to: (a) escape female dominated society; (b) have access to consistent and positive male role models; and (c) possibly escape a cyclical pattern of poverty, ignorance, incarceration and disenfranchisement. A complicating feature **was** that in 1962, only 11% of Negro applicants could pass the Armed Forces Mental Test. White applicants, on the other hand, proved four times more likely to pass this assessment. This test was written to assess the mental capability level of a 7th or 8th grade student. Failing this test **was** described by Moynihan as, "The ultimate mark of inadequate preparation for life . . ." (p. 40).

Much reform sprung from the findings of The Moynihan Report. The War on Poverty, Civil Rights and desegregation movements, all gained support in the years following 1965. As one examined the current state of affairs for the American Negro Family, it must be concluded that situations worsened exponentially with the passage of time. Moynihan offered no solutions to these problems; theorized recommendations were outside the scope his report. It is interesting, however, that so much was accurately

predicted so long ago. Efforts from a wide variety of sources have proven fruitless or harmful in helping Negro Americans. Echoing a very old debate arose the question: is the condition of the American Negro family beyond fixing or is it just too expensive? Continuing research on this politically and emotionally charged powder-keg is warranted.

A Nation at Risk

The following section details the history, components and effect of this report on administrators, teachers, students and society in general.

In 1957, the Soviets launched Sputnik and started a trend that put the spotlight on American schools. Such attention caused friction between reformers and existing educators. Disagreement eventually led to many of the recommendations contained in A Nation at Risk.

The substance of A Nation at Risk emphasized the limitations of schools. While many proponents of educators rallied to support the position that the schools were doing a good job and producing a quality product, a shift began to take place.

Awareness and movement. Stemming from many reform efforts and the work of authors like Moynihan, political actors turned their attention to education with the creation and release of another momentous and seminal work: A Nation at Risk (Gardner, 1983).

For many education administrators and teachers, it seemed like the last 25 years exemplified an exercise in a 'dump truck" delivery method of reform. Often unwanted, the newest reforms were escorted down a red carpet path of political activism (Cuban, 1995; Hunt, 2008; Shannon, 2005). Still fresh from the last reform sting, educators frequently expected to implement (someone else's) new and improved program.

Haphazardly, chosen programs quickly replaced the last unfruitful or juvenile effort. Hunt (2008) suggested this often occurred long before previous programs had a fair chance to work. Over the last 25 years, however, a real change in the thinking and behaviors of educators took place. Hunt (2008) elucidated the three shifts in thinking and practice from A Nation at Risk, through No Child Left Behind (NCLB).

The role of administrators in the early 1980s was managerial. Hierarchical management models flourished (Hunt, 2008). After the release of *A Nation at Risk,* educators turned toward what was best described as an "excellence" model. Hunt held that more attention was given to increasing student and teacher standards by "fiddling with" classroom practices (see also Cuban, 1993; Elmore, 2003). This period gave way to longer school days and years. Further changes reflected more rigorous teacher requirements. Management models for administrators remained virtually unchanged during this first period.

The second phase in the reform process was the "restructuring" movement. This reorganization was supported from educators; and, it consisted of a flattening of top down management practices (Hunt, 2008). Distributed leadership models were experimented with, adopted and flourished. Site-based councils and professional association membership became prolific. While school leaders worked toward relinquishing control, the attention they received increased. The restructuring movement encouraged principals to improve their schools by focused application of skill, knowledge and creativity. During the restructuring movement, the ability for a principal to think clearly and quickly became more important. While this movement caused some administrative discomfort, Hunt (2008) theorized that many leaders saw it as a growth opportunity. Juxtaposed with

the restructuring movement came a greater call for accountability, state mandated testing and public reporting.

The "standards" movement was the last major shift in educational restructuring. With the passage of NCLB, standards based education strengthened linkages stemming from *A Nation at Risk*. The states without uniform academic standards quickly scrambled to adopt them. These new standards accompanied legislative mandates, assessment schedules and sometimes curriculum (Hunt, 2008). The spirit of the 1994 education reform of Goals 2000: Educate America Act was essentially streamlined by NCLB. Whereas schools offered a much wider curriculum, NCLB mandated schools into focusing on core subjects. Many educators felt as if their efforts were being devalued and marginalized. Annual Yearly Progress (AYP) measures replaced the drive for balanced education across a wider curriculum. A recent study showed that elementary schools had decreased attention to non-core subjects by 71% (Hunt, 2008). While previous reform efforts paid too little attention to subgroups, NCLB via sanctions and putative measures, made an attempt to ramp up underperforming individual and subgroups. Whether NCLB was a real attempt to improve the educational outcomes of subgroups or simply a mechanism to usher in privatized education remained to be determined (see also Shannon, 2005). Many schools, however, continued to marginalizing the most High-risk groups in an effort to reach their mandated AYP goals.

The journey to present has been full of change, challenge, and often frustration for many administrators and educators. Hunt (2008) demonstrated a clear evolution from paternalism, through collegiality, to what could best be described as indecision and frustration. For many schools and educators, reaching their AYP targets meant another

year's employment. The NCLB mandates may have hurt the very populations they claimed to champion. Federal mandates were and continue to drive the current education mechanism (see also Cuban, 1993; Shannon, 2005). The carrot-and-the-stick approach turned into a one-big-stick policy. What was clear from 25 years of various reform efforts was that educators can certainly expect more of the same. The next section examines one state's experience with such cyclical reform.

Kentucky Education Reform Act

The following section discusses the Kentucky Education Reform Act and several of its major successes and failures.

Flexibility required. While it can be effectively demonstrated that many reform efforts proved ineffective to disastrous, one reform effort demonstrated an unnatural resilience (Kannapel, 1997). This successful longevity was not attributed to any form of immediate or distal success; but instead, it was viewed as a willingness to continue the tradition of change-as–you-go leadership and implementation.

School reforms remained cyclical and prolific. The very nature of reform seemed to endure in a recurring way. While many reforms came in the shape of "curricular tinkering" (see also Cuban, 1993) the Kentucky Education Reform Act (KERA) was something a bit different. KERA was an ordered restructuring of state schools by the Kentucky Supreme Court in response to a financial equity lawsuit in 1989. Given a very limited time to restructure education in Kentucky, the framers included not only curricular aspects, but also finance, accountability and governance (Kannapel, 1997). Taking effect in 1990, the roll out and implementation of KERA was watched closely by many states. KERA proved itself one promising model of reform, and many of its

components helped comprise NCLB (see also Cuban, 1993; Elmore, 2003). Kannapel (1997) employed a qualitative case study design in examining KERA. The research began in 1990 and was centered at the Appalachia Educational Laboratory (AEL). The research continued through at least 2000. The Kannapel report discussed the first six years of KERA and its implementation, adjustments, reception and reaction.

Several of the components of KERA demonstrated themselves quite successful (Kannapel, 1997). Given the historical vacillation of education reform, KERA surprisingly maintained momentum and stability. Kannapel suggested several factors that contributed to this consistency. First, KERA was rolled out incrementally. This gave educators a chance to adapt to many of the changes previously mandated. The list of changes was far too large to discuss here; however, a short list of successes highlighted the scope of this reform.

A perceived increase in student learning occurred. Funding became more equitable. Family resource centers became an unexpected gem related to this reform (Kannapel, 1997). School-level decision making lent empowerment to those school members who may have previously lacked voice. Unexpectedly, many of the numerous transformations were embraced by educators as long overdue. Kentucky administrators, teachers, parents, and students heralded the opportunity for change.

A second reason KERA remained steadfast was because of its flexible nature. Opposition existed to many of the aspects of KERA. Policy makers responded by trimming down the size and scope of the reform. One such example was when state policy actors reduced the original 75 valued outcomes to 57 academic expectations. Wisely, Kannapel argued, policy makers chose to listen to the valid complaints about

KERA and address some of those complaints (1997). Far too numerous to discuss here, Kannapel claimed dialogues pertaining to complaints surrounding KERA remained and enjoyed a degree of encouragement. KERA proved to be a media darling since its inception in 1990. A general feeling at the Kentucky Department of Education was summed up in the following statements: "The day nobody is annoyed about education reform is the day it has died in Kentucky. When people are stirred up that means we still have their attention " (Kannapel, 1997, p. 8). In the following section, some of the flaws of KERA are discussed.

Despite the general feeling of success that permeated KERA stakeholders, a few large problems remained. The first of these was the state accountability and testing model. Although this accountability system underwent numerous changes, opponents decried it as invalid and unfair (Kannapel, 1997). Developed for Kentucky students alone, opponents rallied for a more universal measure since its inception. Another criticism emerged that Kentucky tests all students and holds schools accountable. It was strongly argued, schools with a large special needs or High-risk population suffered unduly via blunt and insensitive policy. The assessment models, including portfolios, required huge amounts of time to prepare for and were suspected to be an invalid indicator of achievement. In short, assessment remained a weak point with KERA.

With the curriculum reform mandated by KERA, a major push for students to learn critical thinking, problem solving and writing skills gained momentum. Gone became the days of repetitious drills and rote memory. Opponents criticized this approach as dumbing-down and inappropriate. Although more research was required to determine if such accusations held water, there grew an eddy of understated sentiment

that basic skills were being ignored as to fulfill the KERA mandate. This feeling was perhaps mirrored nationally with NCLB. Kannapel (1997) argued that schools became preoccupied with meeting mandate requirements and many continued to ignore the business of doing what was best for students (see also Cuban, 1993; Elmore, 2003).

The implications of the success or failure of KERA proved as varied as the Kentucky weather. Critics of reforms like KERA stated the goals of educating every child, in every subject, to a proficient level was impossible. Predictably, schools in mass numbers failed to reach their Annual Yearly Progress (AYP) targets. This occurred for KERA and NCLB standards. On one hand, it was demonstrated that schools taken over by state departments of education performed no better and sometimes worse than those they replaced. It has been strongly suggested that these types of reforms performed merely mechanisms for preparing the path for education privatization (Shannon, 2005). One the other hand, since society (or political actors) changed rapidly, the nature of education reform must remain cyclical. Regardless of the intent, the street-level bureaucrat clearly saw the carrot of education reform removed, and the stick grew proportionately. It appeared that another restructuring or reform will soon take the place of the last one. Despite the impressive staying power of KERA, it appeared the siren song of cyclical education reform was returning stronger than ever. The next section discusses how education reform on a national level continues to be a disaster.

No Child Left Behind

KERA and many of its components contributed to a blueprint for No Child Left Behind (NCLB). This newest reform effort inherited many of the shortcomings of KERA

and was planned without much expertise, foresight and flexibility (Elmore, 203; Shannon, 2005).

Picking up the slack. The purpose of Elmore's (2003) article was twofold. First, Elmore pointed out design flaws inherent to NCLB. Second, Elmore recommended what practitioners could do to try to compensate for NCLB failings.

The design flaws of NCLB were only matched by its haphazard assembly (Elmore, 2003; Shannon, 2005). Political analysis aside, it was worth noting that education experts remained absent in the framing of this particular reform effort that was jointly created by the Bush Administration and in collaboration with several distinguished political actors. In the following section, NCLB assumptions and flaws are discussed.

NCLB overestimated the influence of high stakes testing while ignoring the capacity- building required to achieve sustainable growth. On one hand, national standardized testing proved attractive to politicians because it is easy and cheap to implement. On the other hand, capacity-building remained time and resource expensive as well as complex. When educators focused on testing rather than instruction, exacerbated problems resulted rather than the intended assessment of real growth (Elmore, 2003).

As previously mentioned, the framers of NCLB failed to use education experts or consult with relevant educational theory. Elmore (2003) held that the mathematical assumptions of the Annual Yearly Progress (AYP) formula proved ungrounded in any education theory. The AYP was counter-intuitive to much of what educators believed about teaching and learning. Assessable growth occurs in stages and is almost never

31

linear as NCLB claims. Additionally, the framers of NCLB ignore the research showing that many schools that meet AYP will at some point return to failing status. This reality is typical of unsupported schools forced into high stakes testing.

Elmore (2003) postulated that since the framers of NCLB based their reform on no defensible theory of practice, their effort was really just a form of experimentation. This is logical for two reasons. First, if one does not want to pay for what works, then one may mandate for something else and hold other parties responsible. Second, if policy makers really do not know how to make schools work, then why not experiment until they find a model that works (Shannon, 2005)? In a political atmosphere based on initiative and not implementation or accountability, this irresponsible point of view prevailed.

The second part of Elmore's (2003) work discussed what educators could do to correct the faulty logic of NCLB. First, internal accountability must precede external accountability. When systems are put into place where quality teaching, learning and assessment occurred, growth occurred. Unfortunately, Elmore held that traditionally in our society, educators are people whom things happen to, rather than those who make things happen. By taking a stand and developing strong practices, norms, and assessment policies, internal coherence began to form. It is this coherence that was demonstrated by successful schools and showed absent in struggling ones.

Leadership at its best was cultural and distributed (Elmore, 2003). There existed an infatuation with personal attributes of leaders in America. This point of view tested counterproductive in that research demonstrated time and time again that when the work was distributive, then so should exist its leadership. Successful leaders modeled best

practices, possessed a strong theory of what worked and what did not, and willingly

shared that vision via powerful and effective discourse. Real leadership looked for

knowledge and ability in surprising places. Elmore held that many of the best schools

possessed one thing in common: the ability to attract and retain students from high SES

homes. There was excellent work going on in many low performing schools.

Unfortunately, due to the punitive nature of NCLB, the good work of many schools and

students may not be deemed as worthy.

Finally, Elmore (2003) posited that because of the fragmented nature of education

in America, educators chose to reinforce NCLB fallacy rather than fight against it.

Additionally, the weak knowledge of many education professionals exacerbated and

reinforced many of NCLB's fundamental premises. Without better knowledge,

mobilization, practice and leadership, educators can expect more of the same bad policy

for years to come. Several authors articulately extended theory and clearly demonstrated

the impotence of policy as a vehicle of change. One such author was Larry Cuban.

The failure of curricular change. Larry Cuban (1993) pointed out the history,

misunderstanding and misuse of curricular reform in the US. Failure of curricular reform

stemmed from a misunderstanding of what actually goes on in the classroom.

Exacerbating this practice was a longstanding tradition of political actors who use

curricular issues as a platform for self-promotion. These reforms enjoyed nearly 100-

year track record of dismal failure.

Since prohibition, schools provided a testing ground and sounding board for

curricular reform. A wide variety of issues from alcohol and tobacco awareness through

AIDS awareness piled onto schools. Have these curricular reforms worked? Cuban

(1993) said that on the surface, it may appear they had made a positive impact. To the

trained observer, however, those apparent benefits actually came from different sources.

Taken as a whole, reforms failed terribly in teaching young people how to behave. The

reason these reforms failed was due to novice reformers who knew shockingly little about

teaching, learning, or the complexities of schools.

Cuban's (1993) work begged the question: Given that such reform efforts proved

so fruitless, why have they remained so prolific? Cuban theorized that reforms remain

popular because all parties involved desired a hand in shaping the future of American

culture. He further posited that regardless of previous successes or failures, the modern

policy maker learned virtually nothing about school effectiveness and pedagogy.

Inherent in policy maker perception bounced about a misunderstanding of multiple types

of curricula and their implementation. In the following sections, aforementioned

curricular models will be discussed.

Tendered by Cuban (1993) was a model suggesting four curricular systems

operating in schools. First, and overly relied upon, existed the "official" curriculum.

This curriculum was made up of the texts, policies and assessments that many believe

drive schools. This was a flawed and incomplete assumption. If one looked at multiple

sections of a single subject, taught by multiple teachers using the same text, different

outcomes will occur. Teachers derived choices based upon knowledge, experience,

clientele and topic affinity. What was actually taught after the door closes proved often

very different than what the mandate.

Second, the taught curriculum was what the teacher actually presented. This

includes what Dewey called "collateral learning" (Cuban, 1993). This included ideas

from classmates, humor, habits and concepts of fairness. The taught curriculum remained tightly linked to learned curricula.

Third, learned curricula did not exactly match what was taught or the official curricula. Learning proved often vastly larger and more meaningful than what was tested. Models of personal relationships were certainly learned, so too, cultural norms, habits and a sense of community. Self-discovery and subject material self-taught, as was so often encouraged, should contribute to learning here.

The final type of curricula theorized by Cuban (1993) was tested curricula. National, state and local tests used various models to capture some of the learning that takes place. Much debate occurred about the validity or ability of these tests to actually assess what a participant knows and can do. Here, the convergence of all curricula was where the rubber hits the road. National and state testing scores remained high stakes and still contributed to ranking states, districts, schools and students. With only a relatively slim data set, many lives, choices and dreams prove dependently contingent.

The implications of Cuban's study suggest that education professionals took responsibility in educating both students and policy makers about the realities of teaching and learning. If policy makers were to "tinker" with curricula, they at least should have possessed a basic understanding of what they were doing (Cuban, 1993). Such understanding may reveal what a small effect existing practices produce. Additionally, there existed many effective models (e.g., Success for All, Coalition of Essential Schools) that fused curriculum, reform and instruction. Such programs should be further studied and proliferated. Only by a solid understanding of teacher power, pedagogy, capacity, context and content did sustainable reform and achievement occur.

Extending the work of Cuban, several authors theorized current models of reform policy are not only ineffective but actually quite damaging. One such outspoken author and his work are discussed next.

Setup for failure. The cyclical nature of education reform proved as strong as ever. Federal government made educational attainment a national priority via NCLB. Although NCLB had been with us since 2002, Shannon (2005) suggested that a complete understanding of its implications to states, communities, schools and individuals remained nebulous. Shannon (2005) endeavored to:

1. Reveal the basic premise of NCLB

2. Make public the various political readings of the NCLB policy

3. To enable action based on this new knowledge in national, state, and local venues.

The stated goal of NCLB was to raise educational attainment for all groups of students. This was particularly so for minority and High-risk groups. For the purpose of this study, Shannon (2005) defined High-risk to be non-white, disabled, English as a second language learners (ESL) and poor. Despite many reform efforts over the past century, target groups proved stubbornly resistant to educational attainment. By 2014, all students must reach at least proficient or above in reading, writing, math and science. In short, NCLB required all schools to perform at a level that no school has ever achieved.

At first glance, the theoretical underpinning of NCLB was unclear--a lofty goal indeed, to achieve what has never been achieved before in the American history of teaching and learning (Shannon, 2005). One was left wondering what the framers of NCLB intended. It proved a mathematical fact that a huge proportion of schools will continue to fail to meet Adequate Yearly Progress (AYP) targets. Shannon postulated

36

this gives reason for NCLB to "discipline" states, districts, teachers and students.

Shannon also posited that NCLB existed simply a mechanism for privatizing education

(charter school movement) and reinstituting a hierarchically structured society. Shannon

further theorized that had NCLB's true intention been to help all students, proven

successful programs like Head Start would have been fully funded; they were not.

NCLB was a policy heavily influenced by Neo-liberal actors. Shannon drew our

attention to Herrnstein and Murray's (1994) work titled *The Bell Curve*. Herrnstein and

Murray postulated that failed students are "doomed to failure because these groups are

inferior and incapable of learning what should be taught at higher levels of schooling"

(Shannon, 2005, p. 26). This chilling comment juxtaposed the position that, "these

groups have had their chance and made the most of their abilities...thus disqualifying

them from further academic support" (Shannon, 2005, p. 26).

Shannon's take on NCLB seemed nothing short of insidious. It was also possible

that this analysis reflected a kneejerk reaction to Neo-liberal political policy. This author

postulated that NCLB was simply a more efficient tool for ranking institutions and

individuals. Certainly, accounts varied on the purpose and effectiveness of NCLB. Both

supporters and opponents of NCLB possessed the ability to support their arguments with

peripheral writings and analysis. Whether NCLB was to be just another failed reform

effort or a mechanism for dichotomizing American society into performers and "human

waste" (Shannon, 2005, p. 28) remained yet to be seen. Obviously, more research is

warranted.

Current Environment

The previous section discussed policy and education reform failure. The following section details many of the significant concepts useful in understanding education and subsequent opportunities.

Perspective

The following three studies detailed an overarching perspective useful in understanding the current political, economic and educational environment.

Policy instruments. The term "policy" has many different definitions used by numerous research authors. For example, McDonnell and Elmore defined policy as "… bringing the resources of government—money, rules and authority into the service of political objectives; and by using those resources to influence the actions of individuals and institutions" (1987, p. 133). This was an elegant way to say that policy was a process or a means by which resources may be delivered to the end user. This work elucidated four generic policy instruments and tendered them to the policy making and research communities.

Mandates were the most commonly used policy tool (McDonnell & Elmore, 1987). They existed as a "quick and dirty" method to enact change. *Mandates* proved the least expensive of the policy tools. A common problem, however, was that mandates often fail to achieve desired results. Many organizations resented mandates as a particularly unpalatable form of coercion. Expectantly, mandate induced outcomes proved short lived, unimpressive, or outright dreadful. Foremost among the causes of *mandate* driven reform failure was an organization's lack of capacity. The lack of knowledge, competence and skill rather than a rebellious nature often supplied the reason for

organization ineffectiveness. Many policy actors incorrectly assumed that such capacity should be present regardless of voluminous evidence to the contrary. Another assumption held that without the *mandate*, such desired action would not occur (McDonnell & Elmore, 1987). Despite many mandated reforms, change and implementation specialists held that such desired actions will not occur under the mandate model regardless of coercion or punitive measures (Shannon, 2005).

In response to an organization's lack of capacity, the second policy instrument was, expectantly, *capacity-building*. Perhaps the most expensive of the theorized policy instruments, *capacity-building* produced outcomes that were distal and often difficult to measure (McDonnell & Elmore, 1987). The formidable expenses of *capacity-building* proved to be financial and often political. Outcomes drawn from *capacity-building* often remain unseen in the space of a political term. Engagement in *capacity-building* activity required patience and resources. The benefits of *capacity-building* informed and enriched their stakeholders in specific, but often intangible ways.

A much more tangible policy instrument was *inducements*. Such *inducements* often took the form of a categorical funding vehicle commonly known as grants (McDonnell & Elmore, 1987). This infusion of money came with strings in the form of benchmarks, quotes, regulations and such similar devices. Similar to *capacity-building*, *inducements* often proved expensive. Like *mandates*, many organizations partaking in incentives failed in the effort due to lack of sufficient resources or capacity. Diverging from other models, inducements often produced quantifiable and very immediate outcomes. Immediate, measurable outcomes were usually politically advantageous and often manifest themselves via "pork barrel" legislation (McDonnell & Elmore, 1987).

With *inducements*, the assumption held that without the money, such performance would not occur.

The final policy instrument examined was *system changing*. This model held that regardless of the resources and effort put into a program, change will not occur without a radical shift in structure (McDonnell & Elmore, 1987). Researchers witnessed this demonstrated **by** various institutions that used methods inseparable from their organizations. No guarantees exist the new model will be any more effective than the last. For this reason, system changing activity reflected the least used policy tool examined here.

Policy research should also include a discussion of problem definition and resource constraints. Once a problem was identified, researchers often looked for the cause. Here, actor values came into play. Policymakers held many contrasting beliefs about social systems in general and program policy in particular (McDonnell & Elmore, 1987). Such policymakers also often asserted themselves in defining how social systems should work. These positions demonstrated a strong influence on which policy instruments will be chosen.

A second factor affecting which policy approach will be taken was dictated by simple economics. Resources and constraints were not mutually exclusive, but instead possessed a reciprocal relationship (McDonnell & Elmore, 1987). Money and knowledge may be a resource; lack of these assets was certainly a constraint. When financial resources existed in short supply, less expensive policy instruments enjoyed use with greater frequency.

It became the primary function of many government programs, including education, to try to meet some federally mandated goal. Subsequently, minimal resources for capacity-building and other forms of growth existed. Further research was required to more fully understand the current wave of ineffective reform effort via ineffective application and understanding of policy instruments.

While the previous section discussed policy instruments, the following section describes another area of the American landscape. The policy instruments discussed previously led to many of the conditions affecting Chicago.

Poverty stricken. Chicago, much like many large, American cities, suffered from a tremendous sense of loss. These losses took the form of lost services, lost jobs, lost vitality and lost diversity (Wilson, 1996, p. 3). In the 1950s, many of Chicago's poor neighborhoods provided vital shops and services, including providing much needed employment. These neighborhoods were often poor; however, the major difference between then and now was that people in the 1959s neighborhoods still worked. As conditions deteriorated, White families, financial capital, vitality and opportunity took flight (Wilson, 1996, pp. 4-5). One poverty researcher examined the shift from working poor to non-working poor, inner-city ghetto (Wilson, 1996).

One of the key features of the modern ghetto manifested itself as pervasive joblessness. This condition brought about exacerbated levels of poverty indicative to the modern ghetto. The poverty however, was not new 40 years after the 1950s. One of the most significant differences between then and now was that that while citizens were poor in the 1950s, they still worked. Work was one of the (or the primary) central, socializing feature of an adult's life. Other social institutions included block watches, political

organizations, churches, schools and others (Wilson, 1996, p. 44). It was work, however, that provided the "linchpin" that kept activity in such organizations possible. With the disappearance of work, the seams holding the community fabric together began to pop.

Manufacturing jobs held two primary benefits unique to low skilled workers (Wilson, 1996). First, simple manufacturing took little or very little training to perform. An employee worked at full capacity after only a few days of employments. For the poorly educated worker, manufacturing provided an opportunity for gainful employment, a central, social center and an opportunity for structure, growth and embeddedness. A second unique characteristic of manufacturing was that much of the work was done in general isolation from the public. Language and personal relation skills were not required to any real extent. For the poorly educated, low-skilled worker, manufacturing provided them job they could do (Rifkin, 1995, p. 74; Wilson, 1996, p. 31).

As manufacturing positions began to dry up, this forced the poorly educated, low-skilled worker into a more service oriented job track for which they were grossly unprepared (Wilson, 1996). Between the years of 1967-1987, Philadelphia, Chicago, New York City and Detroit all lost at least 50% of their manufacturing jobs (Wilson, 1996, p. 29). This loss of manufacturing manifested itself in two subtle ways. First, under skilled men defaulted into the service economy. Second, with a flooded supply of applicants that flowed into the service economy, wages, security and benefits diminished. Nearly everyone associated with the loss of manufacturing suffered. It was, however, the poorly educated, low skilled, often Black, urban male that was affected most severely (Rifkin, 1995, p. 74; Wilson, 1996, p. 54). Up to 80% unemployment for this group became common.

The negative effect on the poor, urban, Black male cannot be overstated. Resentment, detachment, apathy and a general sense of hopelessness became common in the urban ghetto. Applicants frequently interviewed completely ill prepared and often resentful (Wilson, 1995, pp. 132-3). Even when jobs were obtained, poor social skills undermined the work environment. Quickly, many such employees would quit or be fired. The downward, self-feeding, spiral of social detachment led to turning toward hustling or street life. By 1989, three-to-one urban,

Black males believed they had a better chance making it on the street than they did by working a straight job (Wilson, 1996, p. 143). The shift toward street life exacerbated many urban, social problems: poverty, criminality, parental absenteeism, violence and drugs (Wilson, 1996, p. 61). Also, the already marginalized Black male continued to break from many of the social supports at his disposal. Demasculated by weak family structure, matriarchal dominance, poverty and repeated failure, the urban, Black male continued to struggle (Moynihan, 1965).

The previous section discussed issues adversely affecting many High-risk, urban, students and their success in obtaining basic services and meeting basic needs. The following section discusses the relation between welfare and student performance.

Welfare and Student Performance

There existed a long standing debate about the value of welfare programs and the need for further welfare reform. Complicating this conversation included the discussion about how resources were spent by schools and social welfare organizations in building communities and driving student achievement.

Welfare and dropout activity. Orthner, Cook, Rose, and Randolph (2002) examined the relationship among academic achievement, dropout patterns and welfare reform strategies targeted to adult population (see also Clark-Kauffman, Duncan, & Morris, 2003).

The research questions involved in this study were not discussed. Orthner et al. (2002) wrote all over the spectrum: from welfare reform to poverty affecting student performance. Substantially covered, however, the researchers discussed social programs. The questions of interest inferred from this study included:

1.   What is the affect of welfare reform on dropout activity?

2.   What is the affect of poverty on dropout activity?

3.   What is the effect of low academic performance on dropout activity?

4.   What is the effect of welfare status and poverty on academic performance?

The design of this study used survival analysis. Data comprised two sets. The first were collected from a 10-year study including administrative school records. Case records of welfare use covered the second data source. Orthner et al. (2002) collected samples from a large North Carolina, urban area and its complementing school and social welfare organizations. An initial sample ($N = 33,274$) of students with social service records from 1992 to 2000 was paired down to ($n = 22,427$) children who received Temporary Assistance to Needy Family (TANF) benefits from 1997 to 2000. African-American participants comprised 85% of the sample, girls 51% and boys 49%. The final sample was restricted to students who took the state assessment for reading or math in grades 3 through 8. Children with disabilities were exempted from this study.

Orthner et al. (2002) used several analytical methods to examine the sample and collected data. Descriptive statistics analysis and chi-square analysis investigated children in poverty and proficiency in math and reading. Tests demonstrated a clear disparity between girls and boys and between African-American and White children. White girls outperformed African-American boys at the proficiency level 2 to 1. The gender gap, while small was significant at ($p < .05$). The racial gap was, "substantial." Different year cohorts performed at significantly different levels. Other than welfare and school records, Orthner et al. (2002) made no mention of sample selection, rates of return or attrition.

A second set of analysis came from data provided by school administrators in regard to dropout activity. While the previous section showed that learning was taking place at earlier grades, for many groups, academic success rapidly diminished by high school. This finding proved consistent with dropout literature (Orthner et al., 2002). Dropout activity ranged over a 10-year period from as low as 17% to as high as 42%. Orthner et al. (2002) theorized that dropout activity moves in patterns aligned with the economy and welfare benefits. Survival analysis was used to determine dropout activity from the 1998-99 cohort ($n = 3,215$). This sub-sample comprised 86% African-American, 46% male, and 54% female participants. By January 2001, 32% of this cohort had dropped out of school. Orthner et al. (2002) admitted that 32% was conservative, as they did not track entire school careers.

The researchers went far beyond determining the nature and scope of the problem in that they presented research based solutions as well. After school programs for TANF children focused on reading and math demonstrated significant success with high poverty

children across a range of ages. When programs were linked over years, the achievement results of participants proved even more promising. Another finding was that participation in extracurricular activities like sports, music, clubs and such, has a positive effect on dropout activity. The idea that participation acts as an insulator against dropout pressures was supported by research of Eccles and Barber (1995) and Randolph, Fraser and Orthner (2001). Researchers also demonstrated that dropout activity was reduced by up to 80% with even the most High-risk populations by encouraging school activities participation.

Exactly what the benefits of after-school and remedial activities were required more study despite some promising initial research (Eccles & Barber, 1995). If it was a laudable goal to close achievement gaps, this research provided policymakers with hard data that may be of use. One limitation of this study existed in the one state model. Another limitation was the use of an over represented sample of urban, African-Americans.

Weak policies, contributed to by depressed economic conditions and deflated aspirations of urban resident were exacerbated by welfare policies that adversely affect student achievement. The following section details this dissertation's final discussion of student detachment and subsequent consequences.

Student Dropout Activity and Its Consequences

The previous section offered some perspective useful in understanding the current environment. The following section details many of the aspects of high school dropout activity.

Post dropout, post incarceration hardships. As the economy shifted from a production-base to service-base, the need for education and skill attainment proved greater than in previous decades (Rifkin, 1995; Friedman, 2006). Unfortunately, however, the problem of high school student disengagement, culminating in eventual dropout remained a troubling dilemma (Orthner et al., 2002). Dropout activity was greatest in urban areas and highest among Black and Hispanic males (Vitaro et al., 2001). Such dropout activity was highly predictive of both future earnings potential and future negative life trajectory (Western & Pettit, 2000). This study examined the effects of dropout activity predicting jail or prison time and post-incarceration employment likelihood. Western and Pettit (2000) also examined which groups were most affected by incarceration. Further analysis examined how those groups influenced employment and economic indicators during and post-incarceration.

The research questions of interest to this author were:

1.   In regard to unemployment and other economic indicators, how are incarcerated groups figured into the calculations?

2.   What is the probability that a high school dropout will be incarcerated?

3.   What is the post-incarceration likelihood of an individual finding employment?

Western & Pettit (2000) used a stratified population design in this study. Results were tabled and interpreted as percentage ratios. Sample data came from three primary sources: (a) U.S. Census Bureau data, (b) Bureau of Justice Statistics (BJS), and (c) Current Population Survey (CPS).

The BJS drew data from prisons and jails. The CPS, on the other hand, gathered data from households and ignored penal institutions, mental institutions and nursing homes. Data were tracked from 1982 until 1996. No mention was made of sample selection or rates of return. Measures of reliability and validity were also left unspecified.

Institutionalized persons were left out of economic indicators like the unemployment index. A tremendous increase occurred in American penal institutions from 1980 forward. A juxtaposed economic recovery occurred during much of the same period. Western and Pettit (2000) demonstrated that because much of the potential labor force was incarcerated, the actual unemployment figures proved to be greatly inflated. For Black men, the employment numbers inflated upwards, 45% higher. Based upon statistics adjusted for incarceration, much of the economic recovery of the 1980s and 1990s existed as grossly overstated (see also, Herviel & Wright, 2005). Conditions for the Black community, as a whole, actually worsened during this period. Employment, for example, in 1996 dropped to a 30-year low point for the Black, male worker (Western & Pettit, 2000).

The impact of incarceration was most significant with young, Black men (Western & Pettit, 2000). The CPS standard underestimated unemployment by up to 8% with this group. Contributing to this error existed in the difficulty in surveying young, black men (Moynihan, 1965). Incarceration reduced the potential young, Black male workforce by up to 11 percentage points. High school dropouts demonstrated themselves, by far, the most susceptible group. Between the years of 1982 - 1996, fewer than half of all Black male dropouts maintained any employment. This was not to say

that other ethnic dropouts did not struggle; quite the contrary was true (Rumberger &

Lamb, 2003). No group, however, struggled with incarceration and afterwards, long term

employment failure, as did Black males. Sixteen men out of 1,000 endured jail at any

one time in 1996. Blacks were between 5 to 7 times more likely to be incarcerated than

their White counterparts. Approximately one third of all Black high school dropouts

suffered incarceration on any particular day in 1996. This number was over three times

greater than Black males who have finished high school (Western & Pettit, 2000).

Graduates were jailed at approximately 10% of their population.

This study implied that more effective methods were needed to keep the high

school dropout-candidate engaged in school. Also demonstrated by Western and Pettit

(2000) was that dropping out of school put an individual at much greater risk of

incarceration and then post-incarceration employment hardships. Such claims were well

supported in the dropout literature (Orthner et al., 2002; Rumberger & Lamb, 2003,

Wilson, 1996). Finally, while the reasons individuals disengaged from education often

remained nebulous, the outcomes demonstrated themselves quite concretely.

The previous section discussed the difficulties with dropouts obtaining

employment as related to incarceration. The following study examines determinants of

high school dropout activity.

Dropout Determinants

High school dropout activity plagued the United States for decades; yet, little was

understood about the configurations of variables that lead up to a dropout decision.

Cairns, Cairns and Neckerman (1989) examined the interaction of dropout variables on

selected groups of participants.

The primary research questions of interest to this researcher were not clearly operationalized by the authors of this article. Questions relevant to this researcher, however, exist below:

1. What are the determinants of dropout activity?

2. Do different determinants of dropout activity affect individuals and groups differently?

3. Are their combinations of determinants that are highly predictive?

4. What are the gender, racial, SES and maturations determinants that affect the dropout decision?

The design of this study was a longitudinal, mixed method case study. From 1982 to 1984, ($N = 475$) subjects consisting of ($n = 248$) sampled participants enrolled in this study. The participants hailed from three different middle schools. Each school was located in a separate community. Cairns, Cairns & Neckerman (1989) did not divulge whether or not participants came from a single district. Geographic details revealed the schools were rural and southern. The participants participated at least once a year over a five year period. By 1987-88, the participants had scattered to 36 different schools spread over 7 states. Impressive, however, the research authors achieved a 100% recovery rate of living participants (3 subjects died prior to completion of 11th grade).

Data collection for this study consisted of document collection of school records, census data and interview. No mention was made of sampling methodology (Cairns, Cairns & Neckerman, 1989). Interviews were completed initially and again near completion of 11th grade. The interview sites varied from school to work to home. Wherever the research authors and participants could get together was suitable. SES data

contributed to the study and came from a modified Duncan index which graduated from 11 to 88 points. The higher scores represented greater affluence. Interviews consisted of taped sessions that were transcribed verbatim.

The variables examined in this study included race, sex, SES, maturation, levels of aggression, academic success, retention status, age and several measures of popularity or peer acceptance (Cairns, Cairns & Neckerman, 1989). Teacher referral or nomination identified individuals demonstrating aggressive behavior. This behavior scaled on a linear model. Physical maturation was subjectively evaluated based on a five point, Likert-type scale modeled after Tanner's 1962 scale. Popularity and peer acceptance was created using a social networking model. Validity of data collection instruments was mentioned, but not discussed. Reliability measures proved absent from this study.

Three forms of data analysis existed in this study. First, a model called direct contingency analysis determined a strong relationship between aggression and school performance. This model proved to be gender and racially neutral. The second analysis model was a logistic multiple regression analysis. This statistical test concluded with findings consistent with the contingency analysis. The logistic multiple regression model loaded five variables at the ($p < .05$) significance level. Regression ran separately for each sex. Aggression and age/grade failure loaded as significant for males. The females tested as the same with the exception that SES played a significant role as well. The final model used cluster analysis. Here the research authors grouped participants based upon traits. This analytical model demonstrated that participants who exhibited the traits consistent with the other models obtained an 82% dropout rate.

This study created persuasive results. Aggression, poor academic performance and being older than peers completed the trifecta for a dropout scenario. There arose a few surprises in this study that were inconsistent with the literature or outside the primary interest of researchers. First, childbearing was a high predictor of dropout activity for both sexes and all races in this study. Second, there was no significant difference in racial dropout activity for black and white males. Finally, popularity status was a non-significant predictor of dropout activity. To understand the full implications of SES as it related to rural dropout activity, more research may is needed. Limitations include the rural nature of the sample.

The previous study elucidated the combination of traits that lead to high dropout probability. The following study examines negative experiences as they contribute to the dropout decision.

Negative experiences and dropping out of school. Dropping out of school proved an activity plaguing not only the United States, but also several other industrialized nations. Canada had some populations characteristic of certain regional groups in America. Dropout activity had been studied for decades and still remained nebulous as well as resilient. The purpose of this study was to "...clarify the role of peer-related variables (i.e. unpopularity/friendlessness and association with deviant friends) in the process leading to school dropout while taking into account the personal, academic and socio-familial variables that contribute to this process" (Vitaro, Larocque, Janosz & Tremblay, 2001, p. 404).

The research questions included:

1.   To test for the role of peer-related variables in the developmental model

that integrates personal and socio-family variables and parental practices.

2.   To examine whether the role of these variables varies according to the age

dropout activity occurred.

The design of this study was not clearly explicated by the research authors. In

later sections, however, it became apparent the methods of the study frame its design.

Vitaro et al. (2001) based their work on a deductive, logical model; and, this study

employed a quantitative survey study design.   Vitaro et al. built a logical framework

comprised from previous studies. These former studies informed design decisions and

provided a source from which to draw theory.

Researchers drew participants from an ongoing, longitudinal Canadian study of

French-speaking boys: ($N = 751$). The sample was representative of the Montreal region

and drew from 53 schools. Sampling methodology and return rates remained undiscussed

by Vitaro et al. (2001). All participants proved Caucasian. No parent of any participant

obtained schooling greater than grade 14. Vitaro et al. used instrumentation taken from

previous dropout studies (2001).

The data collection portion of this study was done by surveys. The Blishen,

Carrol, and Moore (1987) scale determined parental SES. An important term

operationalized by the research authors was, "occupational prestige." A second

instrument used was the Socio-familial adversity index. This survey measured family

structure, educational attainment, employment and child rearing age of parents. Another

tool used was the Pupil Evaluation Inventory or PEI drawn from Pekarik, Prinz, Liebert,

Weintraub, and Neale (1976). This instrument examined aggression, social withdrawal

and likability. The final instrument of interest was the Exposure-to-Deviant-Friends scale.

The primary variables under examination in this study included: (a) Negative social experiences; (b) Parental support and supervision; and (c) Friends' deviancy that lead to dropout activity. Researchers strove to examine effects of variables on age and in relation to early or late dropout activity.

Vitaro et al. (2001) used several statistical tests to analyze these data. Of particular interest was a deviation from logistical regression in favor of a discrete-time survival analysis model previously employed by Singer and Willett (1993). This decision was made in an effort to detect early and late dropout activity. Standard T tests contributed to statistical analysis. Statistical significance was set at ($p < .05$). Predictive variables were examined individually and as a component in a predictive model. No mention of reliability or validity measures was contained in this study.

Vitaro et al. (2001) produced findings intermittently consistent with the literature. This study found that disruptive behavior proved a predictor of early dropout, but not later dropout activity. Next, poor academic performance was an indicator for late dropout activity, but not early. Having friendships with deviant persons predicted early dropout activity across the board if parental support was not present; however, having deviant relationships predicted early dropout behavior only if parental support existed. Finally, high family adversity in the forms discussed earlier predicted dropout activity regardless of age from 15 to 17.

Supporting the research of Cairns et al. (1989), it was determined that the social importance of acceptance and popularity might be overused on the theoretical field of

play. Interestingly however, this study demonstrated the powerful variable of *deviant friendships* to be an area for future interest. Such *deviant friendships* were shown to be an area of concern in the later research of Achenbach, Dumenci and Rescorla (2003). It is theorized that deviant friendships in combination with rejection of more conformative peers proved extremely predictive. Clearly demonstrated by Vitaro et al. (2001), combinations of risk or predictive variables proved highly accurate in foretelling future dropout activity. One limitation of this study was the wholly Caucasian sample.

The previous two studies examined variable and combinations of variables that proved highly predictive in detecting dropout activity. The following study examines the influence of family on behaviors leading up to dropout activity.

Family influence on the dropout decision. The high school dropout phenomenon is not simply regulated to minority populations in urban settings. Indeed, rural, White America suffers from an insidious version of the dropout malady. Okey and Cusick (1995) explore the generational linkages, school perspective and influences families pass on to children who drop out of school.

This study used ethnographic design. Okey and Cusick (1995) employed interpretive methods in approaching their research questions. The questions of interest to this author were:

1. What characteristics best describe the dropout families' background?

2. What were the parents' of dropouts, school experience like?

3. What was the dropout students' experience that led to the dropout decision?

4. What was the parents' experience with their children's schooling?

Data were collected via interview. Okey and Cusick (1995) took a varied approach to selection of interview models. While they chose mostly closed end protocols, they also addressed validity and reliability by cross checking individual stories and interviewing self correcting families. On occasion, a family member would correct another during an interview thus clarifying and achieving consensus.

One rural Michigan county provided sample families. Local administrators were consulted in collecting information about potential dropout families. Of the 70 families recommended, Okey and Cusick (1995) chose to sample, to interview, to build theory, and to synthesize concurrently while selecting amongst families. By the selection of the 12th family, the researchers felt they had achieved data saturation. Okey and Cusick (1995) discovered multiple themes within each of the families studied. The participants of this study typically included White, low SES, poorly educated, and often unemployed or on government assistance individuals.

Okey and Cusick (1995) identified several themes concurrent with each family. First, each parent viewed school as something required by law. They did not recognize any inherent or enriching value; but instead, they saw school as a ticket required to get a job. Of the 24 parents, 12 had dropped out of high school. Many of their parents (current student's grandparents) had also dropped out. The concept that doing ones best in school, in work, and in life would enhance one financially and socially was beyond the grasp these families.

Each family had numerous examples of dangerous or illegal habits. Alcohol and drug use was rampant among family members. Constant legal trouble related to substance abuse was common. These findings proved consistent with poverty and

dropout literature (see also, Wilson, 1996). Almost without exception, family members smoked. Poor health, violence and poverty were also common. Childhood ended quickly for the participants in this study. All participants were exposed to and participated in multiple High-risk behaviors at a young age (Okey & Cusick, 1995). Such activity has been identified by several research authors as particularly damaging (Dunst, 1992; Garbarino, 1995; Rumberger, 2000).

The children who dropped out began detachment long before the actual dropout decision was reached. Okey and Cusick (1995) reported bullying, difficulty making friends, poor academic progress, and unfair teachers as primary reasons for detachment. These dropout causes were exacerbated by frequent absences due to pregnancy, drug overdoses, rehabilitation, court appearances and general poor health. The dropout students involved in this study relished skipping school and saw their behavior not as destructive, but instead bucking an uncaring, unfair and generally cruel system.

For the parent and the student, the dropout decision often came as a relief. All of the stress associated with due process in school would stop after dropout. Since parents typically devalued education, dropping out would allow their child to start work early. No mention was made of the long-term affect of dropping out. Nor was any mention made of the diminishing manufacturing economy. Such forward thinking, Okey and Cusick (1995) suggested, was beyond the parents involved in this study.

The implications of this study informed educators to renew commitment to the marginalized child in several ways. First, providing safe and nurturing school environments was critical in running effective schools (Rumberger, 2000). Also, Okey and Cusick (1995) reinforced similar studies that demonstrated a general lack of

appreciation for the benefits and relationships schools provided (Bernt & Keefe, 1995; Orthner et al., 2002). Next, the dropout participants in this study knew that if low skilled jobs dry up, then government services would support them until work returned. Regardless of race or background, until families can see the benefits of educations and forego immediate gratification, dropout activity will continue to plague America (Moynihan, 1965). Last, this study demonstrated how the negative effects of just one instance of perceived unfairness or callousness can reverberate through generations.

Data sets, methods and dropout activity. Over the past two decades, a debate evolved about the true nature of high school dropout activity. Such conversations and data proved useful in economic forecasting and a host of other related fields. Studies that examined dropout activity and graduation rates often generated very different outcomes. This was due to three main variables: data sets, analysis methods and bias. There existed a wide range of variability in each. Heckman and LaFontaine (2010) worked to clarify exactly what levels of dropout and graduation existed while they identified the methodological choices and biases of various contributing authors.

Heckman and LaFontaine (2010) used "unified methodology" to examine several data sets pertaining to dropout levels and graduation rates. They reviewed research literature in an effort to detect bias in the field. The data sets ranged from the 1950s to 2004 in some models.

Heckman and LaFontaine (2010) provided no separate section of research questions: This author, however, developed these questions that represented their work:

1.   What were the primary data sets used to calculate dropout and graduation status?

2.   What were the methodological choices used by researchers in calculating dropout and graduation figures?

3.   What are the inherent biases common across research methodologies?

There are three primary sources of data that have been used by researchers for the past several decades. Depending on one's biases, it was argued that America was in an educational crisis or that American schools were performing better than they have in 30 years. The first data source was the Current Population Survey (CPS). This survey was administered by telephone monthly. It polled around 50,000 households and was sponsored by the Bureau of Labor Statistics (BLS). Once a year, the BLS provided a supplement to its normal employment and earnings survey. The supplement asked detailed questions about education background of household members for 18 to 24 years old. One household member provided information about the other members. This form of sampling error constituted one criticism. Other weaknesses included: (a) General Education Development (GED) certificate as equivalent to a diploma, (b) incarcerated persons and military were not sampled, (c) the CPS did not contact all persons eligible (low sampling coverage), and (d) recent immigrants provided sample data. These methodological errors skewed graduate calculations with an inaccurate positive bias (Heckman and LaFontaine, 2010).

The second source of data came from the U.S. Census Bureau. A subsection of the census was called the Integrated Public Use Microdata Series (IPUMS). This instrument collected data on 1% and 5% representative samples of U.S. residents. It possesses benefits over the CPS in that it sampled institutionalized individuals and military personnel. The IPUMS data instrument also tracked immigrant trends since

1970. Two limitations of this instrument did, however, limit its sensitivity. First, the U.S. Census was only administered once every 10 years, whereas the CPS was administered annually. Second, the IPUMS did not distinguish GED from diploma. This accounted for a serious limitation since the passage of No Child Left Behind. NCLB choose not to acknowledge the GED as a true graduate diploma. Many studies indicated that only small difference exists between the GED certificate holder and the dropout who had not attained a GED certificate. This delineation, therefore, became useful.

Another notable data source used by Heckman and LaFontaine (2010) was the Common Core of Data (CCD) provided by states. Most states reported graduation rates between 68-70%. This method was suspect to bias because if a student was held back, it usually occurred in the ninth grade. Freshman class counts tended to be 20-26% larger than the eighth grade class enrollment. To account for this, CCD figures were examined in the eighth grade where matriculation was virtually assured. After accounting for this trend, the researchers discovered two things. First, data more closely conformed to CPS and Census data. Second, when researchers claimed only a 50% graduation rate for minority groups, they used this type of data subject to a temporal bias. Compensating for this bias, it would be more accurate to say that based upon CCD, 50% of High-risk individuals tended not to graduate (within the standard four year cycle).

The GED was originally a device used by post-WWII veterans that interrupted their schooling to honor the call to arms. Annually, over 700,000 dropouts sat for the GED. Much of the popularity of the GED stemmed from the mandate that it be made easier to pass. In 1960, for example, only 2% of all high school diplomas were GED. As of 2010, however, GED certificates represented 15% of credentials (Heckman, &

LaFontaine, 2010). After accounting for GED certificates, prison GEDs obtained (78%

of all prisoners are dropouts), immigrants who did not fully attend American schools, and

military personnel (over 98% HS graduates), overall graduation rates have not

significantly changed in the past 40 years despite a roller coaster type vacillation.

Individual groups, however, revealed a more telling story.

Supporters of NCLB heralded the position that graduation rates were on the rise.

When one looked at racial groups, however, "All sources agree and exhibit the same

general patterns . . . Contrary to previous claims in the literature, racial gaps in graduation

have remained largely unchanged since the 1950 birth cohort" (Heckman & LaFontaine,

2010, p. 253).

Gender also played a significant role in dropout play. Males tended to be more

sensitive to dropout pressures than do females. Data provided by Heckman and

LaFontaine (2010) showed a trend of growing male dropout while female resiliency

appears constant. Black and Hispanic males remained most susceptible to dropout

influences (Heckman, & LaFontaine, 2010). The pressures contributing to this trend

were left mostly unexplored; however, repeated calls for further research continued.

Cognition

The previous section described high school dropout activity, causes and

consequences. The following section examines how American youth perform on mental

health indices and international academic assessments.

Mental health. The magnitude of change in American society over that past two

decades proved hard to follow. Different research authors pointed to their work as

showing improvement or detriment. Achenbach, Dumenci and Rescorla attempted to

determine if the troubles of American children were getting worse or better (2003). This study attempted to test competencies and problems as determined by parents or guardians of American children from 1976 to 1999.

Achenbach, Dumenci and Rescorla (2003) provided no separate guiding questions other than the super-ordinal purpose of the study. The questions in this article came only after data had been gathered and analyzed. The design of the study was exploratory and inductive.

The design used in this study was comprised of mixed-methods, comparative and longitudinal. It was mixed-method because the data collection was done by interview and survey. This was a longitudinal study because the research authors had collected data over a 23-year period. Finally, this study was a follow up model at the tertiary stage. A first follow-up study had been done a decade earlier.

Although many of the data gathering practices have standardized across the nation, there existed many complications that limited the understanding of the mental health of American youth. Achenbach, Dumenci and Rescorla (2003) posited that because of training and instrumentation variance, as well as parents' reluctance to report negatively, researchers might not have gotten an accurate or complete picture.

Sampling was done by administering the Child Behavior Checklist (CBCL). This instrument had been used in over 50 countries and was rated both highly reliable and valid. The samples examined pertained to children 4-16 years old. Interview methods accounted for samples in 1976, 1989 and 1999. The samples included ($n = 1,442$; $n = 2,466$; and $n = 1,641$) respectively. These samples held minimal variance except for the 1976 sample which excluded children that had been referred for psychiatric assistance or

counseling. Return rates and levels of attrition were not discussed by Achenbach, Dumenci and Rescorla (2003).

This study used MANCOVA and ANCOVA tests. Achenbach, Dumenci and Rescorla (2003) used these methods to look for comparisons and trends. While gender and age comprised the main variables, a variety of racial and ethnic comparisons added to this work. Significance level was set at ($p < .01$).

The overall scores were dichotomized into problem scores and competency scores. From 1976 to 1989, problem scores increased and competency scores decreased. From 1989 to 1999, this trend was reversed. Achenbach, Dumenci & Rescorla (2003) cite two possibilities for this outcome. First, researchers concluded parents' perceptions of children behavior was not steadily deteriorating. The data implied high reliability in this assessment. Parents did however, report higher instances of "other" problems and "whining." These characteristics, along with, "hanging around with others who get into trouble," could be an indication of instrument desensitization occurring over a period of 23 years. Second, tests detected a shift in the behavior of American teens (Vitaro et al., 2001). It was suggested that the "whining" activity deserved clinical attention.

The implications of this study suggested less parental supervision and structure existed with modern children. Expectantly, this came as no surprise to researchers. Another implication was that during the economic boom of the 1980s, fewer problems occurred with adolescents. This suggested a corollary link between economic health and children's psychological well being. Work from various research authors shored up this position; however, more research was required to better understand the phenomenon.

The next study examines Kentucky and American children's performance on international, academic assessments.

Academic health. The recently graduated high school student entered a world vastly different from the world entered by their parents (Smith-Mello, Childress, Watts, Schrimer, & Dunavent, 2008). Automation and outsourcing reduced the labor market to positions localized and service oriented work or jobs that demanded higher education and skill attainment (Rifkin, 1995; Smith-Mello et al., 2008; Wilson, 1996). Employees now competed against skilled professionals from India, China, the Philippines and other emergent countries who provided high quality work for a fraction of the cost of an American worker (Friedman, 2006; Smith-Mello et al., 2008).

The questions of interest to this author included the following:

1. What is the nature of the, "flat World" and what will the affect be on the U.S. student / worker?

2. What is the progress of the U.S. student relative to their international peers?

3. What is the progress of the Kentucky student relative to their domestic peers?

4. What strategies are proving most effective in yielding the highest academic returns on public investment?

Smith-Mello et al. (2008) wrote a policy-oriented, theoretical study. Data collected for this study came from a variety of domestic and international sources. The Trends in International Mathematics and Science Study (TIMSS) and the Program for International Student Assessment (PISA) comprised two primary sources. Statistical

compilations from the U.S. Department of Labor and U.S. Department of Education accounted for two of the domestic sources. Students ages 9, 13, and 15 tested internationally for TIMMS and PISA. The National Assessment of Educational Progress (NAEP) accounted for national data and the Commonwealth Accountability Testing System (CATS) contributed locally.

Data analysis methods examined scores from the differing assessments; however, many other areas also underwent examination. For example, attainment trends nationally and locally were tracked as were per pupil expenditures (Smith-Mello et al., 2008). Various studies on poverty and teacher quality informed this study. Data from 1992 to 2007 allowed for a thorough analysis.

Analysis revealed dismally poor performance of U.S. students in general, and Kentucky students in particular, on international assessments. In categories of Math, Science and problem solving, U.S. students' performance hovered near the bottom of tested industrialized countries (Smith-Mello et al., 2008). As a student progressed in their studies, by age 15, they fell far behind their European and Asian counterparts. Kentucky's students ranked 34th in the U.S.; and, despite massive infusions of money and several notable reform efforts, U.S. and Kentucky students continued to struggle (Smith-Mello et al., 2008). As this awareness began to creep into the American conscious, it appeared the policy makers, educators, industry and parents were pinning their hopes on education. Of interest to researchers, U.S. students performed worse academically the longer they stayed in school. While 9 year olds were competitive, the 15 year old cohort performed pitifully when compared to international contemporaries (Smith-Mello et al., 2008).

As a country, there existed vast differences in expenditures per pupil, teacher quality, levels of student poverty, levels of parental education attainment and local policies regulating class size. Each of these variables contributed to student achievement (Smith-Mello et al., 2008).

International figures on these variables remained elusive or unobtainable. Taken as a whole, however, Smith-Mello et al. (2008) made transparent the relations between each of these additive and cumulative factors. First amongst these factors was teacher quality. Researchers disagreed about some variables related to teacher quality like possession of advanced degrees or years of service. In agreement, however, was the notion that only though high-quality teachers, could students make adequate progress (Smith-Mello et al., 2008).

Smith-Mello et al. (2008) did not paint a rosy picture of the near or distant future. While some states enjoyed tremendous advantage individually, American students and future employees, as a whole, remained in serious academic and economic trouble (Friedman, 2006; Rifkin, 1995; Wilson, 1996). If political actors were going to continue to pin the blame of economic hardship on poor educational outcomes, then the response to such was outlined clearly by Smith-Mello et al. (2008). Rather than perpetuate an endless cycle of impotent reform, (see also Cuban, 1995) research based practices endorsed by policy and education experts offered the best opportunity to regain international academic and industrial standing.

Literacy

The previous two studies discussed mental health (better), and international academic health (worse). The next section examines the digital divide in relation to

literacy. The next two studies examine literacy models; the third discusses technical literacy standards.

Models of literacy. As technology use increased in society, it became apparent that such usage was not equally distributed across a population. Computers, Internet access, and mobile computing all contributed to what must be described as technology use. The implications of technology use affected all manners of economic, education and political activity. Technology greatly enhanced the quality of life for some while technology benefits remained stubbornly elusive to others. Carvin (2000) explored two areas of the digital divide. Second, six areas of literacy were operationalized. Last, discussed barriers to technology. These discussions attempted to answer the following questions:

1.   Does a digital divide truly exist?

2.   If such a divide exists, what is the dividing line or factor?

3.   Is it the case that many factors contribute to the digital divide?

Basic Literacy described the condition where individuals struggle to read or write at the most primitive level. Such individual were incapable of reading the material contained in the Internet. While the federal government spent upward of $260 million annually to combat illiteracy, the illiterate remain stubbornly embedded in American society (Carvin, 2000).

Functional Literacy was the condition where an individual can marginally read basic or simple words or signs. Functionally literate persons struggled to fill out job applications, read maps or instructions. Functionally literate persons exhibited an inability to express themselves or communicate in the written form. According to the

U.S. Department of Education, one fourth of all adult Americans possess only functionally literacy (Carvin, 2000).

Occupational Literacy described the condition where an individual has developed, "soft" or "people" skills for the first time. Occupational literacy attuned employees to the habits, norms and rituals of an organization. Examples included effective communication, appropriate dress and punctuality. Such attunement demonstrated a vital step toward the development of higher literacies like Technical Literacy (Carvin, 2000).

Technical Literacy detailed the ability to understand, and use productively a wide range of Information Technology (IT) tools. Technical literacy described as an understanding of hardware, software and systems. A technically literate person understood how to use technology for communication and productivity. The value of such individuals remained marginally unrecognized by most Licensed Education Authorities (LEAs). While most experts recommended significant funding be channeled into teacher training, LEAs on average, spent only 10% of the recommended amounts (Carvin, 2000).

Information Literacy described the ability for an individual to filter or sift through the vast array of knowledge available to them. This knowledge was used as digital or print, spoken, broadcast, or intuitive. Unique to modern individuals, many had grown up without formal filters or guides to navigate the wealth of information available. An information literate person wanted the ability to choose what information to consume rather than to rely on government censorship (Carvin, 2000).

Adaptive Literacy described the ability to learn new tools and systems quickly. A person trained to the adaptive level was easily acclimatized to new situations and

technology. In an environment that released new technologies daily, such a level of literacy became invaluable. While different groups and individuals adopted emerging technologies at different speeds, it was clear that the adaptively literate people did so more often, more quickly and more thoroughly than others (Carvin, 2000).

The barriers to content which contribute to the digital divide were categorized into five main groups. These barriers included: (a) Local Information barriers, (b) Literacy barriers, (c) Language barriers, (d) Cultural barriers, and (e) Accessibility barriers. Expectantly, the factors that contributed to the digital divide represented a complex milieu. Clearly, understanding the digital divide required more examination. Future research will prove useful in fully understanding each of these barriers and how they contribute to the digital age.

Changes in digital literacy. This study examined the levels of the complex components of digital literacy among different aged groups of participants. Alkalia and Chajut (2009) had a secondary purpose to operationalize their conceptualization of what they defined as six different, "skills."

Closely linked to the purpose, Alkalia and Chajut (2009) included no separate set of questions; however, within the text, the authors made quite clear that they were investigating four separate skill sets. These skill sets tested for included: (a) Photo-visual; (b) Branching; (c) Reproduction; and (d) Information tasking.

Alkalia and Chajut (2009) used a quasi-experimental, follow-up study design. It was an assessment based study. No mention of validity was present; however, the research authors made reliability a key component of the study. They used an inter-grader model, similar to inter-rater reliability scheme. The graders were blinded to

participants name, age and gender. They determined a ($r = .95$) rating, suggesting high levels of coherence.

Sample was discussed and broken into three age groups. All participants lived in Israeli agricultural areas: 38 high school students, 36 college students, and 37 adults, 30-40 years old. All participants used a computer daily. Of this group of 111 participants, a sample of 60 was selected. There was no mention of randomization or of selection criteria. A matched control group of 60 participants was also created. No mention of either return rate or attrition was present (Alkalia & Chajut, 2009).

The data collection model used in this study was performance-based. Participants were tasked to perform a photo-visual or graphics project, a word processing project, an Internet research and planning project, and to write a biased comparative report using five separate Internet sources. No mention was made of the order in which the tasks were performed (Alkalia & Chajut, 2009).

The researchers used matched T tests to compare means. It was interesting that the authors used four different levels of significance, .05, .01, .001 and .0001. Several statistical texts described this practice as "Fishing" for significance, and considered an undesirable practice. Two sets of analysis were performed: 2002x v. 2007x and 2002x v. 2007c. The research authors chose not to analyze scores from the 2007 experimental and control groups. This was not surprising since they were matched groups of similar samples.

The results of this study fell into two areas. Outcomes held fast for the experimental and control groups. This suggested that results were an indication not of testing and assessment error, but of phenomenon. First, the older participants closed the

gap that existed in 2002 between them and the younger groups, particularly in tasks that relied on experience and technical proficiency. Second, for the critical thinking areas, the scores of the younger groups (high school and college) either decreased or increased insignificantly. Alternatively, the adult group increased critical thinking performance significantly. These results implied an educational focus on technical skill was employed rather than critical thinking and problem solving, particularly for the youngsters. Limitations of the study included that they used only one ethnicity and that all participants came from rural backgrounds.

The implications for education policy makers suggested that although schools and students appeared to have made progress becoming more technically proficient, they may had instead, mentally diminished. Youngsters lost quite a bit ground in the higher order or problem solving arena. Whether or not these phenomena were related was not discussed. Further research on this topic may prove fruitful.

Standards in digital literacy. Since the mid 1990s, there arose a tremendous push for educators to put technology into the hands of students (Kay & Honey, 2005). Indeed, much success in access to technology was achieved. With the tremendous outlay of funds for technology, stakeholders securitized the work being done with such technology and found it lacking. While it can be argued that simply having access to resources represented a victory, Kay & Honey posited that much more work needed to be done. The authors strove to make sense of the curricular choices and standards required to keep students (and ultimately the American labor force) competitive, particularly when compared to international counterparts.

Technology education relegated itself along the line of very basic instruction (Kay & Honey, 2005). This model was the norm in most American schools since the computer revolution found roots in public education. There was, unfortunately, a huge distance between being able to run various computer applications and performing critical thinking, data analysis, communication and problem solving activities. The aforementioned activities represented what Kay and Honey termed information communication technology (ICT) literacy (2005).

Change was fueled by U.S. students' feeble performance on international assessments: (a) Programme for International Student Assessment (PISA), and (b) Trends in International Mathematics and Science Study (TIMSS). Industry, academia, government and local stakeholders all called for a new paradigm. An important first step in defining the new paradigm was to clarify what skills were to be taught (Kay & Honey, 2005). In developing these skills, a scrutinizing eye was cast toward Europe and Asia in general, and England in particular.

Easily confused or mislead, the modern student did not often benefit from consistent guidance or filters that screened out or made sense of the information behemoth that was available (Kay & Honey, 2005). With such challenges in mind, the partnership for 21st Century Skills released the following set of standards. They included: (a) Communicate effectively, (b) Analyze and interpret data, (c) Understanding computational modeling, (d) Managing and prioritizing tasks, (e) Engaging in problem solving, and (f) Ensuring security and safety. Such standards represented a nice start; but, by no means did the standards resolve policy or implementation questions.

Policy as a tool for education achievement was most recently passed via NCLB. Unfortunately, NCLB contained no provision for assessment of any ICT literacy type standard (Kay & Honey, 2005). Given the fragmented nature of state's departments of education in general, the first, best answer existed in a partnership between government, industry and education. Such a partnership was formed including Educational Testing Service (ETS) and the International Society for Technology in Education (ISTE). These organizations informed the 21st Century Skills organization and provided education professionals the very guidance, support, and resources that had been lacking since the inception of the technology education age.

The implications of this movement held some promise. Caution, however, should be exercised so that well meaning organization and stakeholders effectively deliver resources to the end users, the students. Kay and Honey (2005) also failed to describe pedagogical decisions about who and when subjects should be taught as well as implementation problems common to all such initiatives. This article ignored several very successful domestic and international initiatives that mapped directly to the ICT objectives (see also Jones-Kavalier & Flannagan, 2008). Such oversight represented and reinforced the proprietary nature of policy in general and technology education policy in particular. Below is a section devoted to the theories useful in understanding the research problem.

Theoretical Grounding

This section was devoted to exploring theories that informed this dissertation. There existed three main categories presented here: (a) Systems Theory, (b) Social Toxicity Theory, and (c) Social Exchange theories. Each section included at least one

study dealing exclusively with theory. Contributing to these theoretical studies were works more grounded in practical application.

Competing Systems Theory

The following section examines how different systems, organizations, groups, and individuals compete for limited resources and opportunity.

Systems theory. Contrary to what many believed, schools existed as open systems in the classical sense. That is, the laws that govern Newtonian Physics tended not to explain the nature and tendencies of human organizations. Truly understanding any organization required setting aside popular opinion and examining such an organization with a critical eye. Katz and Kahn (1966) provided a theoretical framework for understanding the complex nature of open systems.

A common fallacy was to assign the characteristics of an organization to either its name or its founder's original intentions. Both name and organizational intention proved likely to change over time and with the shuffling of personnel. A far more accurate and efficient model existed for classifying organizations

According to Katz and Kahn (1966), organizations remained best classified by the stability of: (a) energetic inputs, (b) transformation of energies, and (c) the resulting product or energetic output. While it was often the case that organizations vacillate though periods of activity, organizations that cannot sustain stability will terminate. It was also useful to refine the ideas of output as sustainable or cyclical to the nature of inputs. While education organizations produce human outputs, it still relied on public funds or appropriations as a primary input. Such inputs were often directly associated with previous outputs in the form of graduates supplying funding or support. We also

know that all such organizations competed for limited resources. Understanding and efficient upkeep of the open system allowed organizations to survive and flourish. Nine elements typified the open system.

Importation of energy exemplified the first characteristic of an open system. Without sustained and adequate inputs, any organism or organization quickly became dysfunctional at best and terminated at worst. Social organizations received importation of energy via personnel, funding, supplies, training and so on. No organization existed as a self contained unit.

Second, Through-Put in an organization described a reorganization of input energies. This was in the form of product or service and should be considered a form of work. Third, Output should was considered the product or service produced as well as the removal of any undesired byproducts of that service or production.

Fourth, Systems as Cycles was useful to understanding organizations in that the energies expended reinforced organizational activities. This often took form in the production of goods ultimately purchased by consumers. With this purchase, more inputs returned to the organization. Of course, many organizations used a non-monetary model. In the case of education it could have been classified as effort and reward. While such events tended to be self closing, when often repeated or combined, such activities provided stability and structure to the organization.

The fifth characteristic of an open system was Negative Entropy. Katz and Kahn (1966) suggested that there existed a form of universal law that directed any organization or organism toward disorganization or eventual death. While this was self evident in organisms, organizations, with careful and capable management extended longevity.

The sixth element of open systems was negative feedback. Negative feedback was crucial as a regulatory mechanism. This form of regulation directed energies and allowed for adjustment of environmental conditions. Without meaningful feedback, organizations quickly became confused, misguided and devoid of meaningful activity.

The seventh component of open systems was Steady State and Dynamic Homeostasis. The Steady State was not void of activity or motionless. Instead, it was useful to understand that there existed many processes of input, renewal, and output that proved continual (Katz & Kahn, 1966). It was continual activity that gave an organism or organization the appearance of steadiness. The concept of Homeostasis conferred upon it the idea that an organism or organization adapted to its environment by acquiring control over external forces. While the basic functions of the system did not change, various peripheral activities allowed the organization to stay in control of its environment and in good health.

The eighth element of open systems posited by Katz & Kahn (1966) was Differentiation. The tenet of Differentiation suggested that as an organization evolved, it began to specialize. Such specialization made it unique from somewhat similar organizations. If one thought of the medical professions, the concept of specialization of organizations was illuminated.

The final characteristic of open systems was Equifinality. The concept of Equifinality suggested that an organization can get to some final state by various mean and various paths. As open systems moved toward regulatory mechanisms, however, Equifinality was often reduced.

While the open-system model often may appear counterintuitive, it stood well as a useful way to view organizational structure, function and activity. Also, like organisms, open systems were always changing. This change may have existed via any of the aforementioned activities. Traditional organizational theorists have often viewed human organizations as closed systems. This author agreed with Katz & Kahn (1966); such thinking was often short-sighted and often counter-productive. If classical organizational theory had learned anything, it must be conceded that practitioners, theorists, and the like should never discount the ever-changing, complex, messy human element comprising human organizations.

The previous section dealt with systems in a very theoretical manner. The following section looks at education systems from a more practical lens.

Ideological smokescreens. The golden age of schooling in America was looked upon by many with a nostalgic sigh. Through the Great Depression and right up to the Launch of Sputnik, most Americans believed that schools were doing the job assigned them. Tyack and Cuban (1995) described a period where optimism in schools was predicted to pull America out of the Depression and put the citizenry back on the road to prosperity. In short, the American public bought into the concept that a better educated citizenry and workforce would cure economic and social woes. Whether true or false, that precept endured into the modern age.

With the launch of Sputnik, Americans became aware of the need for greater concentrations in math and science. The popularity and support common in the 1940s & 50s quickly eroded by the 1960s. The public, according to Gallup, began to lose faith in institutions in general and schools in particular (Tyack & Cuban, 2005, p. 13). With the

release of *A Nation at Risk*, many political actors, educators, and parents put full faith in one famous byline, "for the first time in the history of our country, the educational skills of one generation will not surpass, will not equal, will not even approach, those of their parents" (Gardner, 1983). Faith in institutions wavered after scandals like the Kennedy Assassination, Watergate, Vietnam, exploding deficits and the Savings and Loan debacle. The age of general dissatisfaction and sweeping, cyclical school reform had arrived.

Tyack and Cuban (1995) claimed that much of the criticism surrounding school performance rang hollow. School size increased tenfold since the turn of the century (Tyack & Cuban). Between 1930 and 1980, the number of high school graduates increased by over 4 ½ times. Large schools could offer a much more diversified selection of electives via economy of scale. Much headway was made in standardizing core curriculums across the country. Progress was being made; orderly and efficient schools were turning out graduates at an unprecedented rate. The eyes of progressives turned toward inclusion.

The groups traditionally underserved by schools included poor, Blacks, handicapped, immigrants and females. Juxtaposed along the Civil Rights movement, such marginalized groups were beginning to find voice. Spring boarding from Brown v. Board of Education in 1954, a refocused plan emerged which included those groups previously considered "uneducatable." Again, progress was being made. Yet, by 1985, Gallup polls tendered a rating that reflected confidence in public schools hit rock bottom. Parents, however, knew better. While public confidence waned in general, schools enjoyed better than average confidence by parents of students attending schools.

Politicians, administrators, and teachers alike suffered from the stinging criticism surrounding school reform.

Given the extreme criticism of schools, unlikely support again emerged. Prima among their arguments was that the social order of the U.S., particularly in urban areas, countered much of a school's effectiveness. Also, extreme vacillation of the economy was exacerbated by an already bad learning environment. Millions of highly educated individual were working simple labor (if they could find work at all) due to the lack of any other jobs (Tyack & Cuban, 1995). Automation and outsourcing placed a further burden on an overtaxed education system (Rifkin, 1995; Smith-Mello et al., 2008). Schools, many supporters claimed, did remarkably well given the external forces and governmental mismanagement that acted negatively upon them.

Governmental mismanagement of extremely difficult areas was often not conducive to re-election. Domestic issues like crime, unemployment, economics, deficit management, fiscal and monetary policy, and race relations were never easy issues to resolve (Rifkin, 1995; Wilson, 1996). Tyack and Cuban posited that much of the education reform of the past 60 years can be attributed to an, "ideological smokescreen" (1995, p. 34). Deflecting attention away from unpopular policies and conditions, then refocusing publicity on education, was as common and cyclical as the dubious educational reforms accompanying such methods. While unemployment figures soared and highly skilled college graduates remained unemployed do to automation, outsourcing, and the spectral mantra of free trade, this author expected more smokescreens right around the corner.

The previous section discussed education reform as a diversionary tactic to pull focus away from more immediate and difficult social and economic issues. The following sub-section discusses some of those issues.

Systemic elimination of work. The way people thought about work had roots in the Industrial Revolution. Agriculture, manufacturing, and service industries defined the areas in which people labor. Since the inception of the computer age, however, the nature of work changed. The rate of this change was not summative or multiplicative, but exponential. The loss of jobs, particularly low skilled, repetitive manufacturing jobs, changed the way citizenry viewed the social contract. This work explored the loss of work and its implications for society (Rifkin, 1995, p. 7).

Western society, industrialists, and businessmen, in a word, "capitalists" have a never ending passion for profit via efficiency. Such efficiency may take the form of improved systems, labor saving capital, or improved communication between strata. While much lamentation has recently occurred due to the outsourcing trends (Friedman, 2006), an even more powerful trend evolved in automation. Theoretically, any job that can be done more efficiently by such automation should be, and therefore often was eliminated. The result of this process led to two million jobs lost annually (Rifkin, 1995, p. 3).

The bulk of these lost jobs have been blue collar, manufacturing positions. The effects of this re-engineering led to upwards of 75% labor reduction (Rifkin, 1995, p. 7). Currently, the U.S. employs an aggregate work force of which 70% of the jobs maintained replaceable status by re-engineering or technological replacement (Rifkin, p. 5). While in better shape than manufacturing, the service industry was also affected.

Some economists predicted that by 2004, up to 40% of many service industry positions will be eliminated (Rifkin, p. 9). Some political entities argued that such unemployment is part of the "natural cycle." The cycle, however, seemed to use a sliding scale. For example, post WWII era leaders boasted 3% unemployment as optimal. By the Kennedy / Johnson era, 4 % was the level. By the Regan era, 5.5% unemployment was considered healthy. While levels of unemployment increased, so did productivity. From 1979 to 1992, American productivity increased 35%. Still, such levels of unemployment, often contributed to by large corporate layoffs, had the characteristics of an epidemic.

Plague-like levels of unemployment typified the economy since the 1970s. While it was commonly understood that most of the unemployed workers transitioned to smaller companies, that view was mostly illusion (Rifkin, 1995, p. 10). The jobs did not exist, nor were they likely to be created. Indeed, when asked about cyclical unemployment, one famous economist stated, "I can't see where they [new jobs] will be created" (Rifkin, 1995, p. 7). Unemployment, it was theorized, may become the single most important social issue of the modern age. While no group was immune to the effects of unemployment, it was predicted the under-skilled and illiterate that suffer most catastrophically (Friedman, 2006; Wilson, 1996).

One study estimated that it took only 2% of the workforce to provide every good and service required by society (Rifkin, 1995, p. 8). There were Japanese companies striving for workerless factories. If such efficiency comes fully to fruition, where will the jobless masses turn to for employment? While federal government programs filled some of the employment voids, not everyone can work for the government. Rifkin painted an unflattering picture of a future filled with employment and economic strife.

The implications of this work informed education in a few significant ways. Job loss due to automation implied that higher levels of education may act as an insulator (Freidman, 2006). This problem of streamlined efficiency and job loss was exacerbated by the outsourcing trends that were only expected to grow (Friedman, 2006). Combined with urban poverty and its characteristics, the level of unemployment for unskilled labor may soon exceed historic levels (Payne, 2001; Wilson, 1996). High schools had a dismally poor track record of providing opportunity factors, particularly for High-risk individuals (Dunst, 1993; Garbarino, 1995). As a society generally and a profession specifically, institutions must be able to offer options other than a welfare check, unemployment line or prison term (Herivel & Wright, 2003; Rifkin, 1995; Wilson, 1996; Wolcott, 1983).

The previous section discussed loss of jobs due to automation and efficiency trends. The following section describes the urban ghetto condition and the employment issues of low skilled workers.

Employment trends for the under skilled. Minority status was one of the most cited indicators of At-risk or High-risk status. Wilson (1996) examined inner city Chicago in regards to race, employment and culture. Opportunities that existed just a few years ago diminished considerably, particularly for the Black, publicly educated, male worker. Wilson examined this phenomenon from a socio-cultural and economic lens.

The employment opportunities for inner-city, Black males have been diminished for years. While much of this may be attributed to loss of low-skill manufacturing jobs, (Rifkin, 1995) for which urbanites may be qualified, equally contributing factors were cultural disregard and prejudice. Many employers learned, from a long history of

experience, what they can expect from the inner-city, Black, male workers. Many of the employers, (Black & White) discussed the general level of apathy or poor work performance that inner-city, Black male typified. Such employees struggled with attendance and tardiness; sometimes they lived far away, sometimes not. Further complaints indicated a high rate of theft and related security risks. Inner-city, Black males were often under incredible pressure by their neighbors to reveal security details from their work. All taken together, employers were reluctant hire any such employees.

Education played a critical role in the development of the "relational" or "soft-skills" required in maintaining employment. Many of the employers Wilson interviewed distinguished quite clearly between the publicly educated inner-city worker and those who received private education (1996). For example, Wilson described that privately educated individuals knew how to interview well. Such individuals, regardless of where they grew up or what color their skin, were more likely to show up on time, prepared, and dressed appropriately. Education outside Chicago Public Schools seemed to better prepare individuals in relational skills as well.

One of the biggest complaints of employers was inner-city, Black, publicly educated, males general level of hostility and resentfulness. Relevant literature often supported such descriptions (Moynihan, 1965). Often such workers were described as dangerous, lazy, untrustworthy and illiterate. Wilson (1996) painted a picture that these workers proved completely incapable of performing in a business environment and even more ill-suited to dealing with the general public. Such impressions often verified and compounded this portrayal by a spotty work history. Many inner-city, Black males drift from job to job. This instability threw up a red flag for most any potential employer.

Wilson (1996) outlined how many employers viewed other ethnic groups. Employers perceived European immigrants, Africans, or Hispanics would work harder, longer and with fewer difficulties. The poorly educated, inner-city, Black male seemed stuck in a downward spiral of employment opportunity.

The implications of the Black male, employment dilemma posed a threat to all Americans. Wilson (1996) suggested that more inner-city, Black males believe they can earn more money hustling on the street than they can, "playing it straight." This was probably true. Unfortunately, education and legal systems seemed completely ill prepared to account for the growing trend of inner-city joblessness. Prisons remained filled with young, Black men who were disenfranchised from an ineffective education and social system (Herivel & Wright, 2003). If educators were to offer a viable alternative to street life, major changes needed to occur in the way we think about and deliver education to High-risk individuals, particularly the inner-city, Black male.

The previous section discussed the plight of the poorly educated, under skilled, urban, Black male. The following section discusses the corporate outsourcing trend and its implications.

Outsourcing America's future. Globalism and its many faces arrived in the U.S. in a big way. Many of the traditional American occupations have moved overseas. Conversely, due to weak interest in Science, Technology, Engineering, and Mathematics (STEM) fields, the companies that chose to remain in the U.S. often hired foreigner born workers because American counterparts proved non-existent. Jobs requiring highly skilled workers were quickly and efficiently outsourced to emerging economies. The trend became popular and profitable for companies to systematically eliminate positions

that required low skilled labor. International assessments in STEM disciplines consistently positioned U.S. students near dead bottom. U.S. dominance in the world economy became and remained seriously challenged (Friedman, 2005). This book chapter discussed what this challenge looks like.

Friedman (2005) began research for *The World is Flat* around February, 2004. While on a business trip to India, he was startled to discover a thriving economy, superior schools, American industrial and service giants, and a highly educated, highly motivated, overtly enthusiastic workforce. Due to the technological revolution, much of the service and technological business was easily, quickly and profitably moved to India. The continuation and expansion of this process was what Friedman termed, "Globalization 3.0" (2005, p. 11).

One example of Globalization 3.0 and its effect on the working American was tax preparation. Licensed Certified Public Accountants (CPAs) outsourced tax returns to accounting firms in India. These firms trained a readily available and skilled accountant in American tax code in a matter of a few days. Supplemented with high speed data transmission, easily used digital forms, and security software, these Indian accountants prepared returns for pennies on the dollar. By 2005, it was estimated that 400,000, U.S. tax returns would be completed by outsourced firms in India. India produced about 70,000 accounting graduates a year; an average starting salary was about $100 per month (Friedman, 2005, p. 14). While accounting work represented just one example, numerous other professions were also affected. Such fields included journalism, finance, telecommunication services and even medicine.

Changing industrial and service patterns represented nothing new. However, changing times proved most difficult for those caught unprepared, undereducated and unskilled. Work moved toward the areas where it was done most efficiently and profitably. Many low skilled jobs have already moved abroad. Recent exodus moved jobs out of America and into countries like India, China, Brazil, Taiwan and Russia (Friedman, 2005, p. 30). Each of these economies possessed some innate advantage over other markets. Not only were there environmental advantages in other markets, perhaps the most important manifested in cost and quality of labor.

The educated worker from India often spoke excellent English. Call centers often improve language quality by offering training in dialect and inflection, British, New England, Southern, Mid-Western (Friedman, 2005, p. 27). Such service centers pulsed with a vitality unknown in similar American industries. Patient, unfailingly polite, and completely competent and professional, these outsourced employees received bonuses based on performance. Outsourced Indian call center operators numbered 245,000 as of 2004.

The selection process for such jobs proved rigorous. Salaries, after a time, reached upward into the $600 range; and, such positions were fiercely protected and outwardly coveted. The screening process eliminated about 94% of the daily stream of applicants (Friedman, 2005, p. 26). Only the best obtained employment; and, they strove for good reviews, potential promotions and bonuses. The less fortunate applicants were relegated back to poverty unknown by American standards.

The American legal system forbade domestic businesses to hire based on IQ scores, no such provision restricted foreign firms (Herrnstein & Murray, 1994). Such

firms hired up the best and the brightest based on language skills, transcripts and IQ scores (Friedman, 2005). The result was that China and India and Russia enjoyed the benefit of American Companies like Dell, GE, 3M, Sachs-Goldman, Citibank and many others. While research remained the prevalent domain of America, high-tech research was recently implemented (and done extremely well) in emerging economies too. They learned, caught up and beat America at its own game.

The implications of this study suggested that America, particularly school age children in America existed in a world of big trouble. While employees in India and China were often thrilled to work for a few hundred dollars per month, such a standard remained mostly laughable to the illiterate, disenfranchised, unemployed American. Foreign students outperformed American high school students on nearly every measure. U.S. firms learned that it was much more profitable to go overseas and take advantage of all the benefits (Freidman, 2006). Not only did they get a superior worker, many countries offered enticing packages for companies to relocate. China, India, Brazil and Russia held companies that are learned American manufacturing processes. Soon, such companies may break away from their Western partnerships and form their own markets (Friedman, 2006). This trend grew while the world continued to shrink and flatten.

Social Toxicity Theory

The previous section reviewed some of the literature on Systems Theory and how it is manifested in society. The following section examines Social Toxicity Theory and its implications.

American Toxicity. In particular, American culture underwent a tremendous change in the past 50 years. There existed compelling evidence that the psychological

health of children run in patterns (Achenbach, Dumenci, & Rescorla, 2003). Further research suggested that such periods of psychological health mimicked the economic health of a society (Achenbach, Dumenci, & Rescorla, 2003). Garbarino used existing environmental and ecological frameworks to develop his Social Toxicity theory that explained many of the struggles that plagued Americans (1995).

Several components comprised Social Toxicity theory. First amongst these was that American society, in general terms, continued to become more dangerous than in previous decades. Such a position was not new or surprising. Several researchers completed extensive work that detailed such phenomenon (Dubow & Luster, 1990; Rae-Grant, Thomas, Offord, & Boyle, 1989; Werner, 1985). Social Toxicity, however, informed this discussion that extended previous work in two ways.

First, Garbarino's Social Toxicity theory recognized that in a toxic environment, the young comprised the group most susceptible to dangers (1995). As this was the case for environmental toxins, it held true for social dangers as well. Children exist completely dependent upon adults to care for, protect, nurture and sustain them. When adults became overwhelmed by all manner of life experiences, children received inadequate attention. Damage was often quickly done. All manner of influences contributed to the social toxicity; and, no family, regardless of how well insulated, proved immune. Indeed, violence, abuses, addictions, instability, poverty, illness and hardship reached into every community and home.

The second component that defined Social Toxicity theory was the awareness that childhood remained a time that required protection. This protection occurred in various ways here in America. One of the key components of western civilization held that a

Social Toxicity and Dropout Framework (2008).

SOCIAL TOXICITY

MATERIAL	ENTITLED	CRIMINAL	PEERING

Keeping up with the Jones	Welfare	Dangerous Neighbors	Need for Acceptance

Material Substitutes	Continued	The Glorified Criminals	Risk Taking

Basic Needs Trumping Quality	Unrealistic Expectations	Right of Passage	Infusion of alternative values

Keep The Lights On	Passing The Buck	Drugs/ Alcohol in Culture	Lack of Relationships w/ Influentials

Administrative Bias/ Entitlement	Paternal Disengagement

Disillusionment/ Increased Risk Taking

Disengagement

DROPOUT ACTIVITY

Figure 2. Social Toxicity Conceptual Framework (2008).
Adapted from the work of Garbarino (1995), this model showed
that dropout activity was a process culminating in a singular
event that reaffirmed Socially Toxic status.

child received support without the requisite of having to, "pay their way and earn their keep" (Garbarino, 1995, p. 8). This position was well parroted in the work of Okey and Cusick (1995).

Childhood existed as a protected niche in society where they learned and grew via play and school. While this was generally understood worldwide, some societies and cultures held much more lax interpretations. As such, many unfortunate children were often thrust into adult experiences while they lived in a child's body. They, unfortunately, often saw their lives rupture with child's eyes. Easily visualized in underdeveloped countries, such activities proved rampant in America also (Wilson, 1996).

While the appearance of childhood existed as self evident, the definition was not. Vast disparity existed as to what constituted childhood rules and norms. Such variation comprised an element of Social Toxicity theory and confused society in general and children in particular. Mixed messages were sent via dress, language, curfews, privileges, school, work requirements and so forth. Mixed signals confused children and muddled the American perception of childhood. Many distinguished researchers held that the longer and more play-filled the childhood, the greater chance of successful life transition (Bronowski, 1973; Montessori, 1967). Many parents pushed the growing-up process and thus exposed their children prematurely to a deadly, socially toxic world in which children were not adequately prepared to transition.

The implications of Garbarino's work informed educational practice in that the awareness of how dangerous the world can be remained essential in preparing youth to

enter it. Garbarino suggested in this chapter, and made explicit in later work, that no child was immune to negative cultural influences. All American children existed in an At-risk status. This concept was strengthened by the work of Dunst (1993) who demonstrated that the affects of negative or risk-factors proved cumulative. By understanding this phenomenon, parents, teachers, administrators and policy makers became better prepared to help transition young people through childhood and into productive citizenry. The discussion of Garbarino's theoretical work is continued in the following section.

Toxic layers of risk. James Garbarino adapted his theory of Social Toxicity from environmental and ecological disciplines. The foundation of Social Toxicity theory has several interesting components. Such components were particularly well suited to understanding At-risk and High-risk individuals. The purpose of this chapter was to discuss risk factors, the accumulative affect of risk factors and their relationship to opportunity factors in children.

Garbarino's work was theoretical (1995). Although he built upon and extended the work of many authors, (Dunst & Trivette, 1992; Rutter, 1989; Sameroff, Seifer, Barocas, Zax, & Greenspan, 1987) Garbarino was credited for Social Toxicity theory development. There were three questions associated with this chapter that this study found useful:

1.   What are the natures of risk and opportunity factors with children?

2.   At what point do risk and opportunity factors begin to greatly affect children?

3.   What methods can be used to minimize risk while maximizing opportunity

factors?

Advancing the work of earlier risk and opportunity theorists, Garbarino developed

the idea that factors of risk were cumulative. A component of Social Toxicity theory held

the belief that all American children remain At-risk. Some, however, possessed more

risk factors than others. Such individuals, he operationalized as "High-risk." This

precept was not new.

Represented Probably Outcomes Based Upon Risk Status

RISK   OPPORTUNITY

| Fractured Family Life, Addictions, Poverty, Poor Health, Sexual Activity, Lack of Positive Mentors, Deviant Friendships, Inactivity, Unemployment | Literacy, Involvedness, Solid Family Life, Healthy Habits, Enough Money, Positive Role Models, Safe Neighborhoods, Structured Activities, Racial Majority |

Welfare, Poverty, Disability, Prison, and Death   **Stability, Success, Health Freedom, Life**

Figure 3. Scales of Risk and Opportunity (2011)

What made Social Toxicity theory valuable was that it allowed for many layers of risk that were counterbalanced by factors of opportunity. For example, a child that lived in a household of a single, minority, unemployed mother possessed three element of risk right away. Opportunity factors offset the negative effects of such a dilemma. For example, having a caring family member involved in the family, an involved school teacher, and an engagement in an athletic team were considered opportunity factors. The equation that demonstrated this concept followed: $-1-1-1 + 1+1+1 = 0$ (Dunst & Trivette, 1992).

Sameroff et al. (1987) completed groundbreaking work that demonstrated any child can successfully withstand two risk elements without serious threat to future well being. This was important because it remained true regardless of the risk elements. For example a child with the risk elements of being minority and poor proved no more predictive than a child who was born of psychotic and abusive parents (given no more factors of risk). When three factors, (or more) of risk accumulated, however, the child was in tremendous risk of future negative life trajectory (Dunst & Trivette, 1992, Garbarino, 1995; Sameroff et al., 1987). As layers of accumulated risk grew, without ameliorating opportunity factors, so did the probability of negative life trajectory. The relationship, ($r = .88$) amongst risk factors, opportunity factors, and IQ tested as positively and highly correlated (Garbarino, 1995, p. 155).

Garbarino identified seven themes relating to resilience and coping. They included: (a) Personal anchors, (b) Cognitive competence, (c) Success, (d) Active coping, (e) Positive temperament, (f) Social climate, and (g) Additional support. While educators and schools had no control over some of these themes, teacher, coaches, sponsors and

adults in general possessed tremendous control over several of them. This research was supported in the social activity literature (Eccles & Barber, 2000).

Garbarino's study demonstrated that any child can be positively influenced by schools, teachers, and programs regardless of what and how many layers of risk they possessed. Avoidance of negative life trajectories should be the first and foremost goal of any concerned adult. If such an understanding, combined with enhanced or refined theory (Social Cognitive theory and Social Exchange theory) were taught to persons involved with High-risk children, a powerful weapon indeed would be placed exactly where it could be best applied to help those most High-risk individuals.

Garbarino's work built upon work previously completed by risk aversion and poverty theorists. One of Garbarino's foundational theories about layers of risk was adapted from Dunst (1993). Garbarino and Dunst informed each other's work on several occasions. The following section discusses Dunst's work.

Layers of risk and opportunity. Various researchers added to the body of knowledge that discussed risk and protective factors for children (Dubow & Luster, 1990; Rae-Grant, Thomas, Offord, & Boyle, 1989). Other research focused on vulnerability and resiliency (Werner, 1985). Still other's work involved resiliency and protective factors (Rutter, 1985, 1987). Such research often promoted the outlook that disaster loomed just around the corner and that it was the duty of a mindful parent to help avoid or stave off such disaster. Bond (1982) best described this position as "overly narrow" and "counter-intuitive" to the growth and well being of a person. Dunst (1993) built off the work of Garbarino (1982) and developed a more sophisticated framework for risk and

opportunity. Garbarino and Dunst continued to expand and refine each other's work for years to come.

Garbarino drew much of his theoretical framework from environmental and ecological disciplines. Dunst and Trivette (1992), and later Dunst (1993), expanded the concepts of risk and opportunity that included intrafamily and extrafamily factors. Strengthening intrafamily opportunity factors depended upon the family's ability to support and develop child confidence and ability. Intrafamily risk factors stemmed from a range of risk characteristics. Extrafamily influences worked in the same fashion but depended on forces outside the immediate family.

While reducing risks in prevention models placed emphasis on deterring or forestalling negative events, Dunst's work, built again upon Garbarino's, developed a promotion model that placed focus upon a the facilitation, mastery, enhancement, and refinement of a person's strengths, competencies and capabilities. Such a focus strengthened participants functioning and adaptive abilities.

Drawn from a variety of research authors, a table of factors describing risk and opportunity was compiled. Such items included but were not limited to: parental education, occupational status, pregnancy, marital stability, parental self esteem, toxic substances, extrafamily support and many others. If a child was born of parents with low education status then that was a risk; however, if such a child had parents with high educational attainment, then that was an opportunity. Such a table of variable was certainly of use to many research authors studying At-risk and High-risk individuals.

Dunst (1993) elaborated the concept of multiple-risk factors. One study alluded to a compounding effect of risk factors (Greenbaum & Auerbach, 1992). This finding

was further supported by several studies showing that a combination of any three multiple-risk factors greatly increased the probability of negative outcomes (Barocas, Seifer, & Sameroff, 1985; Dunst & Trivette, 1992; Sameroff et al., 1987).

The Dunst (1993) study was significant because he detected that multiple opportunity factors could counter-balance multiple risk factors. This theory, in 1993, was newly evolved and then built upon later by various authors. The notion, however, that research was demonstrating that life trajectories could be strongly influence by positive extrafamily events, regardless of a child's home environment was profound. Another key finding of this study was insight into multiple-risk factor status. Researchers and educators now possessed a greater understanding of risk factors, risk frequencies and ways to counteract their effect on children.

The implications of this study suggested that positive life experiences within and outside the family were critical, particularly in the positive development of At-risk and High-risk children. This theory was supported and in agreement with the work of Eccles & Barber (2000) in that positive activities (often school based) really did have a profound and often lasting effect, particularly with At-risk and High-risk individuals.

The previous section discussed layers of risk and opportunity and their counterbalancing and cumulative nature. The following section informs out understanding of Social Toxicity Theory by illuminating the social conditions and consequences facing the high school dropout.

The post-secondary lives of dropouts. The high school dropout problem in America remained stubbornly elusive prey. Up to half of minority male populations engaged in dropout activity (Heckman & LaFontaine, 2010; Vitaro, et al., 2001). A less

skilled workforce proved a significant threat to economic competitiveness (Friedman, 2006; Rifkin, 1995; Wilson, 1996). If educators, policy makers and young people were to understand the full significance of a dropout decision, then a more accurate understanding of consequence was required. Rumberger and Lamb (2003) worked to provide a piece of that understanding. While much work was done on dropout activity, this study filled a gap in understanding the activities of students who had ever dropped out, regardless of future re-enrollment. In the dropout literature, this distinction was rarely studied. The components of this research compared U.S. students also with Australian students. It was, however, the American students' experiences that were the focus of this review.

The questions involved with Rumberger and Lamb's research of interested to this author included:

1. What are the post-secondary education, training, and employment experiences of individuals who dropout?

2. What are the post-secondary education, training, and employment experiences of individuals who dropout only to finish at a later date?

3. What are the post-secondary education, training, and employment experiences of individuals who never drop out of school?

The design used by Rumberger and Lamb (2003) was comparative. The study further employed secondary data analyses from data collected from the *National Educational Longitudinal Survey* (NELS). The first year, 1988 served as a baseline. Subsequent data were collected in 1990, 1992 and 1994 respectively. The initial 1988 sample consisted of ($N = 25,000$) participants. After six subsequent years, however, the

study sample had been reduced to ($n = 13,120$). No mention was made of sampling strategies, rates of return, nor of the high rate of attrition. Data analysis methods used a binomial probit and a multinomial logit model. Results were displayed as ratio percentages.

Individuals who never dropped out of school went on to further their education at nearly 61%. Individuals who had dropped out and did not return pursued training at near a 10% rate. Those individuals who dropped out at some point and then returned to graduate continued training at near a 21% rate (Rumberger & Lamb, 2003).

The number of hours a graduate was productive proved a bit tricky for Rumberger and Lamb to calculate. Their summary, however, completed a telling picture. Dropouts did not pursue full time training. Graduates pursued a great deal of training, often while working. The graduate was in school or working 92% of the time. The dropout-but-returned to finish school was active 68% of the time. Finally, the dropout was active in school or work 55% of the time including 1% further schooling activity (Rumberger & Lamb, 2003). Interestingly, individuals who dropped out and then returned to obtain a diploma earned no more money than individuals who dropped out and stayed out. This suggested that while an individual had the cognitive ability to graduate, it was the non-cognitive skill set that proved deficient (i.e., work ethic, perseverance). Graduates, return-to-school graduates, and dropouts all earned about the same amount of money per month as calculated around 19-20 years of age. Of interest, however, return-to-school graduates did earn about 7% more money than dropouts. Graduates earned about the same amount of money despite 61% of them were also engaged in higher education. The

long-range earning calculations and predictions often associated with this type of study were not included (Rumberger & Lamb, 2003).

The implications of this study suggested and demonstrated that individuals who drop out of high school were much less engaged in the economy at ages 19-20 years. The socially toxic nature of American society often allowed or pushed young people into a life that they were completely unprepared to compete in. Well represented by the studied dropout, instances of immediate gratification and sloth often replaced hard work, persistence and patience (Rumberger & Lamb, 2003). Also, dropouts did not get the additional training essentially required to maintain employment in a service based economy (Friedman, 2006; Rifkin, 1995; Smith-Mello et al., 2008; Wilson, 1996). By understanding this fact, people in a position to influence dropout candidates may have more success than had unfortunately become the norm. The next logical step in this area of study is to collect earning data on participants many years past initial employment and graduation.

The previous study elucidated the socially toxic pattern of many American youths. The following section engages in a detailed discussion about the nature of High-risk status in individuals.

At-risk status clarified. There existed many definitions and components to what educators defined as At-risk. No one definition applied to all contexts. The Colorado School Finance Act defined At-risk to be, "students as those eligible for the federal Free and Reduced Lunch program" (Middleton, 2007). The Title 1 program of the U.S. Department of Education defined At-risk to be, "children living in poverty, limited English proficient children, migratory children, children with disabilities, Indian children,

neglected or delinquent children, and young children in need of reading assistance"
(Middleton, 2007). Another lens used to examine At-risk was a medical one. Moeckly
(1992) explored physical and psychological characteristics of At-risk high schools
students.

Physical symptoms of At-risk individuals took many forms. Such children often
suffered from all manner of maladies including stomachache, headache, nausea, cold/flu,
upper respiratory infections, gastroenteritis, asthma, obesity and dysmenorrheal.
Pregnancy often manifested in dropout activity. This list was, of course, incomplete
(Moeckly, 1992). Psychological problems too, often manifested themselves as physical
ones.

The psychological component of At-risk students was also quite varied. Such
students suffered from anger, depression, anxiety, sadness, eating disorders, diminished
self-esteem, learned helplessness, impulsiveness, hyperactivity, addictions, irritability,
destructiveness and general lack of trust in adults (Moeckly, 1992). Psychological
counseling had increased dramatically since the 1970s. Often schools operated in a
setting ill prepared to deal with the myriad of conditions At-risk children brought with
them to school.

Another way to think about the characteristics of At-risk children was to approach
the problems from a situational standpoint. Situations often triggered physical or
psychological symptoms. Such situational instances described by Moeckly (1992)and
others included poverty, minority status, English as a Second Language (ESL), divorce,
frequent residence change, being a grade repeater, having a sibling perform poorly in
schools, coming from a large family, and coming from a single parent home (Cairns,

Cairns & Neckerman, 1989; Orthner et al., 2002; Rumberger, 2002; Vitaro et al., 2001; Western & Pettit, 2000; Williams, 1995).

The final section of At-risk characteristics was viewed by Moeckly (1992) and others and was best described as socio-cultural. Examples of socio-cultural contributions to At-riskness included maintaining deviant friendships (Bernt & Keefe, 1995). Another avenue to At-risk status was school disengagement (Eccles & Barber, 2000; Wilson, 1996). It was further demonstrated by Tyack & Cuban (1995) that large schools were much more insensitive to At-risk student needs. Single parent status, poverty and parental education often typified a primary risk factor (Moynihan, 1965; Garbarino, 1995; Wilson, 1996).

There appeared to be four favored indicators for At-riskness. These four characteristics were often used to measure At-risk characteristic because they are easily quantifiable. These four components are: (a) poverty, (b) minority status, (c) single parent household, and (d) parental levels of education. It was noted that while these four typified the most convenient measures, little evidence indicates they were the most *accurate* predictors of At-risk characteristics (Moeckly, 1992; Payne, 2001; Shannon, 2005). Defining what At-risk was greatly depends upon the lens one used for their research. Further research in this area may prove fruitful.

Social Exchange Theory

The previous section discussed elements of Social Toxicity Theory. The following section reviews the literature concerning Social Exchange Theory.

An affect theory of social exchange. This review combined and extended existing theories of social exchange. It also introduced and articulated an affect theory of

101

social exchange. This theory drew from many other theoretical frameworks, extended and built upon them. Lawler (2001) did this by conceptualizing individual actors, emotions and thinking. He also treated emotions as internal rewards or punishments. Finally, Lawler (2001) accomplished his goal as he analyzed how individuals' group and relational attachments were linked to their emotional experiences via social exchange.

Many questions existed in the course of this work. The primary research questions of interest to this researcher included:

1. Under what structural conditions will exchange produce emotions and feelings?

2. Under what conditions will this emotion be attributed to social units thus generate collectively oriented behavior?

3. What is the nature of the object-emotion link?

4. To what extent do varied models of social exchange produce different social-emotional outcomes?

This work was conceptual. No experimental, comparative, or survey aspects were present. Although the research author drew from many classical or long-standing theories, the affect theory of social exchange is a more robust and complex theory explaining group emotional dynamics.

The structural aspect of Lawler's theory relied on an occurrence of mutually reciprocated dependency. Participants fostered a mutual respect and realization that they worked better and more effectively together than they did alone or with other parties. Lawler (2001) posited this type of activity produced positive emotions that strengthened

the cohesiveness of the group (3 or more). Interestingly, however, lack of social exchange and cohesiveness produced punitive emotions like shame and anger.

Lawler (2001) introduced four structural models of social exchange in the Affect of Social Exchange theory. Productive Exchange existed as actor-to-group and offered some sort of goal that achievement of is of common benefit. This benefit was singular in occurrence and can only occur if certain members of the group perform certain behaviors. An example of this consisted of three graduate students collaborating on a paper and having drawn on individual expertise that not one member could have done this alone. Actors were interdependent upon the behaviors of group members. Productive exchange produced the strongest level of affective attachment and shared dependence. This model was also most likely to generate the strongest emotions associated with success or failure.

Negotiated exchange occupied a clearly understood contractual deal. These agreements proved binding. Each actor was required to do their part. Shared responsibility and jointness tested strong. Lawler (2001) suggested these types of exchanges often occurred under unequal structural power. Under this model of unequal power, actors often blamed other parties for failure that resulted in anger and detachment. Self interest was usually stronger in unequal power models.

Negotiated exchange often was not clearly contracted for and often resulted in emotional disconnect. Pride in self sometimes conflicted with shame if goals were not strongly achieved. Anger toward others frequently dominated emotions when goals remained unachieved. Successes and failures tended to support global group emotions (Lawler, 2001). Shared responsibility was considered lower in negotiated exchange than in productive exchange.

Reciprocal exchange provided unilateral regard without explicit sense of reciprocity. Tacit understanding replaced explicit or contracted agreements. Exchanging favors or invitations are examples of reciprocal exchange. The effects of actors proved additive at the group level while obligations tested as implicit. Contributions of actors were separate. Strong and close relations frequented this exchange model. Goals tended to be global while interactions often proved quite personal. A compliment on a job well done often resulted in immediate feelings of pride in this model. Reciprocal exchange fostered individuality and a giving nature from participants (Lawler, 2001). Reciprocal exchange tested weaker than negotiated exchange.

Generalized exchange was indirect (Lawler, 2001). Benefits tended to be motive and linear. Actor A provided a service to actor B and then was rewarded by actor C. Givers and takers of emotions and service permeated the organization. This sometimes included nested groups that provided services to the organization as a whole or to other groups. Benefits possibly fostered inter-group service and dependence instead. Generalized exchange supported the concept that individual support the group as a whole. This model provided a theoretical underpinning of social order. Emotions demonstrated in this model proved frequently less extreme as were feeling of autonomy and responsibility (Lawler, 2001).

As these models demonstrated, different structures produced different emotional and cohesive results. Power levels often determined which structure was most appropriate for groups. While some exchange models fostered extreme inter-dependence, others did not. The implications of this research suggested that knowing which model was a best fit may dramatically strengthen the effectiveness and cohesion of a group.

When determining levels of shared responsibility, this theory will prove useful (Lawler, 2001). Clearly, empirical research will flesh out the promising, yet theoretical start.

The previous section discussed an Affect Theory of Social Exchange. The following section discusses a more traditional view of Social Exchange Theory.

Reciprocity. The concept of reciprocity attained much attention going back several millennia. The give and take system of reciprocity was described as part of a defacto human condition. One esteemed sociologist, Howard Becker suggested replacing Homo sapien with the title Homo reciprocus (1956, p. 1). Other authors suggested reciprocity served a social-mechanical invention, by which civilization was built and continued to rely upon. Despite much attention, reciprocity, while tacit, also remained stubbornly elusive in defining. Gouldner (1960) attempted to elucidate the multi-faceted composition of this what reciprocity was and how it worked.

Gouldner (1960) examined reciprocity by use of a theoretical design. While his review of the literature encompassed many decades, spanned numerous fields and included many important theorists, he was quick to describe reciprocity as complex and poorly understood. Gouldner stated, "aims" of his paper. While he used only three, this author delineated some of these complex goals into more succinct tenants; they included the following:

1. What manner is reciprocity tacitly involved, yet formally neglected by modern functional theorists?

2. What are the concepts involved with reciprocity?

3. What are reciprocity's diverse intellectual contents that facilitate theoretical use and research utility?

4.   What concrete ways, provided from the clarified concept, may provide new leverage for sociological theory, particularly in accounting for stability and instability in social systems?

Reciprocity was given due attention by such authors as Durkheim, Rirth, Homans, Levi-Strauss, Malinowski, Mauss, Marx, Merton and von Wiese (Gouldner, 1960). Many other researchers followed suit. Functional theorists stressed that patterns must be identified as some problematic instance of behavior, institution, role or commonly shared belief. Much of the functional theory of reciprocity was concerned with survival. Over time, if a behavior or pattern was detected, then it had survived. If it was no longer detected, then it had not survived. Functionalists held that all survivals persisted due to functional patterns. One such pattern, Gouldner (1960) posited, was reciprocity. One of the limits of the functionalist view, however, was that reciprocity was rarely truly equal in terms of frequency and like patterns. Indeed, such examples of survival existed (although quite rare) that eschewed reciprocity completely. This concept gave rise to the study of *exploitation.*

While *exploitation* has historically been covered by various academics, it was explored in various types. In the modern sciences, exploitation frequently was restricted to describing only sexual exploitation. Examples of religious, egotic and economic exploitation have all but disappeared. In understanding reciprocity, however, it was useful to understand *exploitation* as an antithesis. Concepts such as social cohesion, power, obligation, duty, right and moral norms became imperative in understanding the mutually advantageous exchange of goods and services (Gouldner, 1960).

Ecologically inclined scientists often agreed as Gouldner suggested, reciprocity existed as a form of social symbiosis (1960). Not only was reciprocity good for an individual, group, or society, but essential to survival. Moral norms guided many of the tacit rules governing reciprocal behaviors. These rules described what a person should do, when and to what extent. There existed two super ordinal rules that guide reciprocity: (a) people should help those who have helped them, and (b) people should not injure those who have helped them. Many of the other rules of reciprocity were governed by cultural norms that can vary greatly. Still, the concept of rough equivalence of value remained constant across cultural boundaries.

Equivalence often took several forms; however, two proved prominent. Heteromorphic reciprocity meant that items or services may be vastly different in form, but equal in perceived value. Homeomorphic reciprocity meant that goods and services were nearly identical in structure and the situation by which they exchanged. Historically, negative homeomorphic reciprocity took the form of retaliation. The biblical quote, "an eye for an eye," illustrated this concept.

The implications of reciprocity informed Social Exchange Theory in several important ways. It was well documented that while poor people often lacked many basic skills as well as financial resources, they absolutely understood and depended on the rules and practice of reciprocity (Payne, 2001, p. 37). Across all social strata, reciprocity was understood formally or at least tacitly. The give and take model of classroom activity, combined with a strong sense of community and cultural cohesion may prove a useful tool in generating opportunities for High-risk individuals. Further study on reciprocity at the classroom level may prove useful in informing the High-risk student conversation.

The previous section discussed reciprocity as a cornerstone to the human condition. Friendships could also be considered foundational. The following section discusses the social exchanges and affects of deviant friendships.

Friends' influence and school. Relevant research suggested that friendships play an important role in the developmental success or failure of the modern American adolescent. Little was known, however, about the extent to which friends held influence over each other. Even less was known about the types of friendships and their differing affect on youth. This study endeavored to see how much friends' adjustment to school influences adolescent adjustment. The study looked at closest, second-closest and third-closest friendships as well. A second purpose of this study was to examine the features of students' friendships and how those features affect school adjustment.

This study did not define questions, but instead, goals:

1.   Examine how much adolescent's friends influence changes over the course of and adjustment to a school year.

2.   Compare the estimates of friends' influence.

3.   Examine the role of the two sexes as it pertains to friends' influence.

4.   Test the theory that positive featured friendships increase adolescents' enjoyment and successful adjustment to school.

Bernt and Keffe (1995) employed a short-term, longitudinal, survey design for their study in an urban, suburban and rural school. The original sample included 305 participants; but, researchers lost 8 to attrition. The final sample consisted of ($N = 297$) students comprised of ($n = 194$) girls and ($n = 103$) boys. The students were all in seventh

or eighth grade. A full 95% of the sample was Caucasian. No mention was made of return rate of sample or methodological sampling decisions.

The data collection instrument was a survey that took about 40 minutes to complete. Bernt and Keffe (1995) administered surveys around October and a follow up survey in April or May. Over 90% of participants named three friends in the fall and spring. The survey consisted of questions about self and friends' perception. Teacher tracked behavior data were also used to enrich the study. Reliability measures for the survey remained undiscussed.

Bernt and Keffe (1995) performed correlation tests for many of the pairings. The scores of these statistical tests proved too numerous to mention here, but where reported, were within acceptable range. Principal component factor analysis with VARIMAX rotation collapsed many of the positively identified features down to two with Eigenvalues greater than 1.00. These two positive features included *prosocial behavior* and *self esteem support* (Bernt & Keffe, 1995). The two negative features included *conflict* and *rivalry*. Reliability measures were calculated throughout this study where appropriate. Reliability statistics showed high internal reliability of coefficient alpha (.88 to .96) across measures. No formal validity discussion existed in this study.

Several interesting results came from this study. First, teachers' ratings were highly correlated to student grade outcomes. Second, students that had several highly positive-featured friendships also performed better in school. Conversely, adolescents who possessed mixed-featured friendship or negative-featured friendships indicated their predictive tendencies toward poor academic performance. Self reports and reports of

friends predicted disruptive behavior. Next, adolescents perceived themselves as more similar to their *best-friends* than really was the case (Bernt & Keffe, 1995).

Multiple friendship influence was sex neutral; however, analysis showed that the influence of *best-friend* was stronger for girls than for boys. There was evidence that suggested small groups of friends could sway boys as strongly as *best-friends* for girls; however, this position should be treated as theoretical until further studies were performed. All of the analysis pointed to the trend that adolescents were strongly affected by peers (Bernt & Keffe, 1995). This conclusion was well supported in related research (Payne, 2001; Wilson, 1996). Next, the nature of relationships played an important role as predictor of behavior and performance. Since this study was of primarily Caucasian students, a more representative selection of participants may tender less limited results. A second limitation was a much higher concentration of female participants.

This study implied that a clear understanding of friendship structures could be very important in a classroom dynamic. If teachers were to reach all students and encourage performance at high levels, understanding peer relationship for both sexes indicated its importance. Differences in group, type and sex friendships implied a need for greater sensitivity and awareness from educators. An inter-classroom study of peer relations existed as a logical next step in this process.

Alternative Possibilities

The first section discussed policy limitations. A later section dealt with the various problems affecting students. High-risk individuals demonstrated the most susceptibility to various negative pressures. Also, attention was given examining the

current environment in which policy makers, educators and parents operate. The next section contained a review of theoretical perspectives useful in understanding this work. In the following section, possible solutions to research questions and problem are presented.

Ability Grouping and Choice

The following section details some of the characteristics of tracking and ability grouping practices. Understanding appropriate use of such practices contributes to this work's relevance.

Tracking. The conversations involving ability tracking have waged for decades. One camp decried tracking as thinly veiled racism (Braddock & Dawkins, 1993; Orfield, 2001). Opposite this position existed those practitioners that held tracking was based on ability and efficiency and thusly justified. While heterogeneous classes remained popular for several decades, many educators, parents and policymakers remained stubbornly resistant to mixed ability groupings (Biafora & Ansolone, 2008; George, 1993). The article by Oakes, Jones, Wells, & Datanow (1997) investigated the current detracking trending of American schools.

Oakes et al. (1997) did not specify a separate section for research questions. Imbedded within the study, however, this author found the following questions interesting:

1. What is the purpose of tracking and detracking practices?

2. Why have homogeneous class grouping remained so stubbornly persistent amongst education professionals?

3.   What are the primary barriers to detracked or heterogeneous class

composition?

The authors, Oakes et al. (1997), employed a qualitative, cross case analysis

design in their study. Ten schools with populations ranging from 3,000 to 500 students

were studied. Decision related to sample selection, population and rate of return

remained undiscussed. No mention was made of validity or reliability measures. Instead,

the study employed "thick description" of participants, particularly regarding their views

about tracking or ability grouping practices.

Participant schools included some from New England, the South, the Midwest,

the Northwest and California. Students' racial mix included White, Black, Hispanic,

Native American and Asian. The study did not discuss ethnic concentrations. In-depth,

semi-structured interviews allowed for the collection of data from school boards,

administrators, teachers and parents. Field notes based upon observations also

contributed to the data collection process. Data collection occurred between 1991 and

1994.

Researchers used cross-case analysis technique to examine collected data. From

such analysis, themes relating to culture, power, racism, elitism and intelligence emerged.

These themes informed the conversation about tracking and detracking practices. Oakes

et al. (1997) grounded their work with a theoretical underpinning of Socio-culturalism,

Cognitive Wave Theory, Culture of Poverty Theory and various theories on intelligence.

Their research illuminated four primary barriers to heterogeneous grouping.

First, white-flight proved a powerful predictor of grouping practices. When

detracking discussions and policies gained momentum, elitist white families threatened to

change schools. Oakes et al. (1997) portrayed this activity as a powerful deterrent to change the status quo.

The second barrier to detracking took the form of parents co-opting teacher leaders within a building. Such advocates spoke with powerful voices and affected school policy profoundly. While the researchers alluded to the position of agreement by such teachers, they concentrated on the element of co-opting of teachers by elitists or powerful parents.

The third barrier to heterogeneous grouping was for parent leaders to form a coalition of less-than-elitists who would campaign against detracking. Such a coalition often represented, or appeared to represent, the will of the community in very clear voice. Oakes et al. (1997) described the practice of educational leaders who bent to the will of local perception, often against their own beliefs.

The final barrier to detracking was identified as bribes. Elitist parents would support some detracking only to secure the perpetuation of continued ability tracking for their children. Such incentive, like additional funding for coveted programs, often proved too enticing to resist.

The implications of this study exacerbated an already tired conversation. Oakes et al. (1997) represented theorists with minimal experience as practitioners. Combined with a socio-political view of the apologist, they rejected the voices of many intelligence theorists and school practitioners. Virtually silent were the authors on fluid models of ability grouping, high stakes environments, homogeneous success and student choice. While they lamented on teachers' practice of judging and ranking, Oakes et al. ignored the importance of what many researchers have identified as a teacher's primary function

(Tyack & Cuban, 1995). Until academia begins to move past race and concern itself with individual growth and standards based education, this author believes that such well meaning but off target conversations, will continue to muddle academic clarity.

Race and mal-distributions of opportunity. There existed an ongoing discussion about the value of tracking or ability grouping (Oakes, 1985). While academics often discouraged this practice, many professional educators considered ability grouping essential to school effectiveness (Biafora & Ansolone, 2008; George, 1993). Tracking practices became even more prevalent in the high stakes atmosphere of NCLB. Braddock and Dawkins (1993) strove to gain a more complete understanding of tracking and ability-grouping practices in the American schools systems. Braddock and Dawkins (1993) stated their purpose as twofold:

1. To clarify the magnitude of the problem of African-American and other students' mal-distributions across tracks and ability groups.

2. To examine directly the link between tracking and student's educational aspirations and attainments.

Two primary research questions closely linked to the study's stated purpose.

a. To what extent are African-American, Latino, American Indian and Asian- American students "mal-distributed" across curriculum tracks and ability-grouped classes relative to their Anglo counterparts?

b. How are students' educational aspirations and attainments affected by their placement in core subject classes of different ability levels?

Braddock and Dawkins (1993) used a survey design. The study was conducted using secondary analysis of survey data, collected by the National Educational

114

Longitudinal Study of 1988. The details of sampling and data collection the primary study remained undiscussed by the research authors.

Data analysis techniques used by Braddock and Dawkins (1993) employed descriptive, predictive and ratio models. Unstandardized regression coefficients explored the purpose and research questions. Comparisons, made among and between ethnic groups of participants, contributed to the study. Multiple regression analysis controlled for sex, age, GPA, composite achievement scores and post-secondary aspirations.

The results of the employed statistical tests demonstrated that African-American students exhibited higher frequency in remedial or regular classrooms than other ethnic groups. Analysis also revealed that students who were placed or tracked in non-college preparatory classes in eighth grade tended to remain in similar classes in high school. A juxtaposed finding was that students placed in high-ability courses in eighth grade took the same type of courses in high school.

The implications of this study proved numerous. The researchers concluded that the tracking and ability-grouping systems, used by so many schools, required change. This study concluded that ability grouping served to, "depress student's educational aspirations and attainments" (Braddock & Dawkins, 1993). This study called for further research into ability-grouping practices as they related to student achievement and aspiration. The researchers implied that tracking practices, so pervasive in schools, which contributed to the major cause for lack of student achievement. A limitation of this study was lack of field research and any mention of validity. Multiple methods and triangulation could offer insight and validity into the studied phenomenon. Braddock and Dawkins remained silent in the discussion of student choice and capacity. The absence

of balanced perspective, combined with racist undertones, weakened the credibility of this work.

Metropolitan tracking practices. This next study was conducted in two New York school districts. A large metropolitan study, filled with a wide variety of school type and students informed this work in a couple of important way.

The academic literature on tracking practices in the U.S. painted an unflattering picture of the practice (Oakes, 1985; Schofield, 2010). Still, the practice of tracking or ability grouping remained quite high, up to 85% (Biafora & Ansolone 2008; George, 1993). Various methods of tracking persisted, including full tracking, partial tracking and informal or (teacher directed) tracking (Biafora & Ansalone, 2008). The purpose of this study was to examine how two the principals of two New York school districts perceived tracking practices.

The questions of interest to this author included:

1.   Did principals have prior knowledge of tracking research?

2.   Did principals have personal memories of being tracked in their youth?

3.   What were the perceived views of tracking from teachers?

4.   What were the attitudes of tracking for gifted and slower students?

5.   What were the perceived influences of key stakeholders determining tracking practices?

This work used an exploratory, comparative, survey design. Of the studied counties, all principals from all public schools participated ($N = 816$). The principals who filled out and returned the survey numbered ($n = 272$). The rate of return was therefore, 33%. Of the sampled principals, 91% were White. Black and Hispanic

ethnicities comprised 3.6% respectively. The vast percentage of principals 87.5% worked as teachers before becoming administrators. Masters degree holders consisted of 75% of the sample, while 25% held doctorates. Female principals comprised 55% of the sample. Based upon U.S. Census Bureau data, principals served three levels of SES clientele, high, medium and low (Biafora & Ansalone, 2008). Blacks and Hispanics heavily populated low SES areas whereas, expectantly, White ethnicities made up the bulk of the highest SES neighborhoods. All studied schools used a neighborhood school model. The keys stakeholders of this study included principals, teachers, parents and students.

The data collection method was three-part. First, an information letter was mailed to all 816 principals in February, 2006. Next, questionnaires were mailed out by March, 2006. By early May, researchers had received back their sample of 272 responses. No mention was made of any follow up email, phone calls or letters. Biafora and Ansalone (2008) did mention the difficulty in penetrating the Local Educational Authority (LEA) bureaucracy. The data collection instrument used a four-point, forced, Likert-type scale. The researchers made no mention of why they chose to omit a neutral option as a response possibility.

The principals involved in this study read and discussed literature surrounding tracking practices. Most of the principals participated in tracked schools (75% high track) as children and retained favorable memories about the experience. Only 8.7% of respondents reported perceiving negative consequences of their tracked experience. Principals perceived they had the most control over tracking decisions, closely followed by teachers. Affluent parents had more control over school decisions than non-affluent

117

parents (Oakes, 1985; Rumberger & Palardy, 2005). The low SES principals, however, favored tracking practices more than the high SES principals, 60.7% to 35% respectively. The high SES principals held that tracking activities perpetuated inequality at 65.5%. Again, low SES principals indicated adherence to this position with much less frequency. That tracking practices remain beneficial for advanced or faster learners, existed as a strongly held truism. Conversely, however, only 25% of principals believed that tracking practices proved beneficial for slow learners (Biafora & Ansalone, 2008).

Researchers demonstrated several major themes. First, there was a stubborn reluctance of educators to stop or slow tracking practices regardless of their position about its effectiveness. Some of this reluctance was due to pressure by affluent parents (Oakes, 1985; Rumberger & Palardy, 2005). Teachers, overwhelmed by systemic demands continued to use unofficial tracking pedagogy within their classes. Teachers did this, often in opposition to LEA policy (Biafora & Ansalone, 2008). Interestingly, students held the least influence in school settings. Ultimately, students would be most affected. Unfortunately, this author had found no study that explored any combination of student choice, high stakes testing, valid achievement measures, or fluid ability grouping practices.

There existed four major limitations of this study. First, principal grade level was not provided. The needs and priorities of high school remained vastly different than elementary schools. Second, no offered explanation satisfied as to the continued proliferation of tracking activities. Third, the low rate of return suggested biased data. Finally, no mentioning of validity or reliability measures was present. Given the perceived voicelessness of existing students, as well as the disconnect between academia

and practitioners (Cuban, 1993), it was clear that more research in this area was needed. This author would like to see a follow-up study performed in a southern, rural area, perhaps Texas or Kentucky.

School level SES and its effects. The next study concerning ability grouping came to us from Rumberger and Palardy (2005). They made contentions vastly different from those previously offered. Since Brown v. Board of Education, hundreds of research studies explored the effectiveness of integration strategies. Policy shifted away from race and was more concentrated on Social Economic Status (SES). Many districts used a bussing or magnet model to redistribute low SES students among more affluent schools. Rumberger and Palardy (2005) looked at the effectiveness of such practices, which were affected and to what degree.

The research questions involved with this study included:

1.   Does high school racial and SES segregation affect student achievement? More specifically, do various measures of the social composition of high schools affect student achievement above and beyond the individual effects of student background characteristics?

2.   Can the composition effects of student background characteristics be explained by school characteristics that can be altered through policies and reforms that do not require desegregation, or are then due to other factors than can only be altered through policies designed to integrate schools?

3.   Does a school's social composition affect White and Black students similarly, or is on group impacted for than the other?

Rumberger and Palardy (2005) did not state the design they used for their study. It was, however, a quantitative study that employed hierarchical linear modeling (HLM). This technique was useful in examining the relationships among and between nested groups within a school. Data were provided by the 1988 National Education Longitudinal Survey (NELS). The sample was drawn from students attending 913 high schools ($N = 14,217$). Of the high school sample, three categories relating to SES emerged: ($n = 151$) high SES, ($n = 641$) middle SES, and ($n = 121$) low SES. These school divisions accounted for 17%, 70%, and 13% respectively. Five dependant variables were chosen from achievement scores: (a) math, (b) science, (c) reading, (d) social science, and (e) composite score. Data provided via principal, teacher, parent, and student surveys defined the independent variables. These independent variables measured four types of school characteristics: (a) composition, (b) structure, (c) resources, and (d) processes.

Rumberger and Palardy (2005) found several emergent themes after running analysis. First, the level of SES at the school level was more predictive of student success than the level of SES at the student level. Schools with affluent populations contained students who learned more regardless of race or SES background. A student entering a low SES school was likely to graduate at a lower level than a student beginning at a high SES school. A composite analysis suggested that up to 25% of variance could be attributed to school status across all tested domains.

Second, after controlling for background, Blacks tested to the lowest level of achievement, followed by Whites. Hispanics, when controlled for background, achieved at the same level as Whites. Asians demonstrated the highest level of growth and

achievement. This analysis was consistent across the literature (Chen & Stevenson, 1995). The reason students who attended high SES schools outperformed their peers was attributed to what Rumberger and Palardy (2005) described as *school processes*.

Four *school processes* accounted for high levels of growth and achievement among all students attending high SES schools.

1. Teachers maintain high expectations for students.

2. Students complete more hours of homework per week at high SES schools.

3. Student take more advanced (college prep) courses at high SES schools.

4. Students feel safe at high SES schools

The implications of this study suggested that schools have much control over practices that matter. While schools have little control over racial and SES levels, they have a great deal of control over *school processes* like teacher expectations (Reed, 2008) and curriculum (Cuban, 2003). High SES schools did a better job in regard to the four processes; low and middle SES schools performed less efficiently (or terribly). Many of the traditional predictors of low achievement demonstrated only a negligible effect on student achievement (e.g., minority status, retention, low SES, single parent status). While moving a low performing student to a middle SES school generated weak results, enrollment in a high SES school generated a larger effect (up to one full year of learning) in catch-up growth. Since moving all low SES students to high SES schools would change the demographics of any school, the best solution seemed two fold. First, schools may continue to encourage enrollment of low SES students in high SES schools. While this was problematic for various reasons, as a practice, it did seem to endure (Orfield,

2001). Second, schools would do well to focus on and develop the four operating

characteristics discussed (Rumberger & Palardy, 2005).

Institutions that Work

The previous section detailed much about tracking and ability grouping. While

most of the conversation revolved around the more extreme models, the persistent use of

tracking was also clearly demonstrated. The following section discusses various

institutions that hold promise in developing successful individuals.

Families that work. The academic success of Asian-American students was well

known. Asian students remained statistically over represented in America's best

universities. While several studies that examined Asian-American student motivation

and achievement, little was known about how they compared to Caucasian-American,

Chinese and Japanese students. It was the purpose of Chen and Stevenson (1995) to

examine the motivation and mathematics achievement of Asian-American, Caucasian-

American and East Asian students.

There existed no separate section discussing the study questions. From the text,

however, several themes emerged as interesting to this author:

1.   What motivates the different groups to high achievement?

2.   What factors account for the differences in mathematical aptitude?

3.   What, if any, are the psychological maladjustments encumbering each

      group?

This study used a comparative design that examined Asian-American, Caucasian-

American, Chinese (Taiwan) and Japanese 11th grades students. Comparative analysis

determined characteristics across groups. Regression analysis accounted for the

differences between groups, particularly with Asian-American students. Statistical significance for this study was set at ($p < .001$). These statistical tests examined mathematics aptitude, gender, value of education, attitudes toward mathematics, SES, study time and psychological maladjustment (Chen & Stevenson, 1995).

The data collected for this study came from 4 different groups located in 3 different regions. The Chinese group came from Taipei, Taiwan, ($n = 1,475$). The Japanese group came from Sendai, Japan, ($n = 1,120$). The Americans were split into two groups, Asian-American and Caucasian-American. The Asian-American sample ($n = 304$) came from Fairfax County, VA (74%) and Minneapolis. The Caucasian sample ($n = 1,958$) also came from Fairfax County, VA (59%) and Minneapolis. Female participants represented 53%, 51%, 58% and 43% respectively. The American sample achieved nearly full student consent while the East Asian school administration mandated participation. Rates of return remained undiscussed by Chen and Stevenson (1995). The schools from which students were drawn proved similar in all but length of instructional calendar; the Asian schools operated on a school schedule equivalent to 30 more instructional days per year.

Chen and Stevenson (1995) found that expectations for the Asian and Asian-American students proved to be vastly different than expectations for Caucasian-American students. Across the board, students through parents, Asian and Asian-American students expected to study longer, work harder and achieve more than Caucasian-Americans. The motivations for these groups seemed different. The Caucasian-American sample viewed education as a way to get a better job or to gain admission to college. The Asian-American cohort took college admission and good job

attainment as a given and viewed academic achievement as a way to advance past just a good job. East Asian students viewed academic success as a way to gain knowledge for its own sake and as a path that led toward a better life. Asian-American students studied about 1/3 more than their Caucasian-American counterparts.

Perhaps the strongest correlation across the board was the amount of education of the father and math achievement. This tested as a positive correlation (.34). This finding was divergent from much of the student achievement literature which focused on mothers' level of education. The perception of psychological "maladjustment" commonly afflicting many Asian students was not supported by this study (Chen & Stevenson, 1995). The Asian and Asian-American participants showed no more stress induced "maladjustment" than did the Caucasian-Americans. The Japanese group demonstrated themselves the most psychologically healthy.

The implications of this study were clear. If perceptions and attitudes of the highest achievers proved programmable, then this study offered promising news indeed. The success of the Asian and Asian-American students proved contingent upon three things. First, the students who were surrounded with the highest expectations did better. Second, the students who worked the hardest tended to achieve the most. Third, the students who had the highest degree of self motivation performed the very best, regardless of other variables. It was unclear how these finding applied to other ethnic groups. More research will hopefully answer this.

Highly reliable schools that work. The cyclical nature of school reform very rarely yielded sustained results (Cuban, 2003). Lack of adequate implementation was often cited as a reason for such program failure (Fullan, 1991, 2005). Another

troublesome aspect of studying reform effectiveness included detecting measurable effect. While some programs demonstrated success at the school level, rarely, if ever, did programs successfully replicate at the district, state, or national levels. Schools often received top down reform mandates that proved unwelcome, ill-received and impossible to implement in their existing form (Elmore, 2003; Shannon, 2005). Both top-down and grass roots reform efforts had their limitations. It was by adaptation to contextual realities, combined with local empowerment that proved a powerful mix in developing one of the most powerful and sustainable education reforms seen in this century. The purpose of this study was to examine the program efficacy of the Highly Reliable Organization (HRO) model when applied to education reform (Stringfield, Reynolds, & Schaffer, 2008).

The concept of the HRO emerged several decades ago. In short, HRO allowed for no mistakes, ever. Any such failure was viewed as utterly catastrophic and acceptable under absolutely no circumstances. Common examples of this theory put into practice included air traffic control, nuclear power plants and chemical transportation. Could such theory be applied to education reform? The researchers, Stringfield, Reynolds, and Schaffer (2008) believed so; and, in a joint reform initiative with one Local Education Authority (LEA) in Wales, England, they put their theory to the test. The result was Highly Reliable Schools (HRS).

Although not stated by the authors, the design of this study was a case study. The questions of interest included:

1.   Did the HRS schools obtain greater gains that the Welsh national totality of schools in their GCSE [General Certificate of Secondary Education] scores over the 3-plus years of reform implementation?

2.   Did the HRS schools demonstrate greater GCSE gains over the subsequent 5 years (2001-2005) than did the average of all Welsh schools?

3.   Were there common characteristics across all HRS schools and other characteristics that differentiated among schools that were able to obtain greater versus lesser levels of HRS implementation and GCSE gains?

Data collected by Stringfield, Reynolds and Schaffer (2008) came from two initial sources. First, the GCSE provided an excellent source that applied to virtually every Welsh and English student. The measurement instrument was used to make high-stakes decisions like admission to career, post-secondary education and school quality. Obtaining five or more A* to C was and remained the goal benchmark. Supplemental data used in this study were detailed case records for each school in the study. Such case records documented the decisions and perceptions of stakeholders; records consisted of over 100, continually updated pages per school. Twelve Welsh schools comprised the cohort. Ten of these came from the primary district studied with two outliers; one was from a neighboring LEA and one was parochial. Researchers also made occasional visits to the Welsh schools; such visits occurred, however, quite infrequently.

The results of this program implementation were impressive within the fields of education reform and program evaluation. The HRS outperformed the national average after their first three years by a margin of 75%. Such improvement occurred while the Welsh national average also increased by 8.3% points. The cohort student mean gain was

14.5% points. What was truly significant, however, was program sustainability (Stringfield, Reynolds, & Schaffer, 2008).. Five years later, the cohort achieved academic gains (8.6%), over double the national average (3.2%). Such sustained results looked more akin to economic growth than education reform. How did the cohort achieve such powerful and impressive results?

Stringfield, Reynolds and Schaffer (2008) interviewed the key, cohort stakeholders. Through constant, comparative analysis, seven important themes emerged. By actively working the HRO themes, key stakeholders wove a complex reform that was sustainable. Clear and few goals initially took form. Goal setting was quickly followed by aggressive student data collection and analysis. Best practices became Standard Operating Procedures (SOP). Collaboration and brainstorming-type professional development enriched the cohort's understanding of best practices and what was working. These off-site sessions were called, "Residentials."

Perhaps the most important theme discovered was the successful management of leadership succession (Stringfield, Reynolds, & Schaffer, 2008). The LEA had enough commitment to the HRS program to promote leaders well schooled in successful HRS implementation. The research authors noted that when a leader from a cohort school moved on, a replacement came from one of the most effective HRS. By a combination of this activity and cyclical goal achievement and resetting, the schools achieved notable results.

This study implied that school reform via HRS became a reality given stakeholder buy-in. Could such a program be implemented at the classroom level, developed, and then broadcasted to entire school or district? While one study was certainly promising,

clearly more work in this area is required. The future of HRS, however, does indeed seem to hold the promise of greater achievement and success for all.

Activities that work. The very nature of schools in the U.S. proved expansive and volatile. The recent state of affairs painted an unflattering picture of the job schools did. Researchers know a great deal about what adolescents did doing in school. Little, however, was known about how student spent their leisure time and how it affected them. This study examined the longitudinal correlates of structured school activity involvement.

The research questions of this study were not clearly explicated by Eccles and Barber (1995). This author, therefore, formulated these questions of interest:

1. What are the short-term effects of structured extracurricular activities on participants?

2. What are the distal effects of structured extracurricular activities on participants?

3. What type of activities generates the strongest and most frequent benefits?

4. What are the differences in outcomes between sexes?

This study used a comparative design. Although not stated, the study appeared to be deductive in nature. The research authors examined the affects of: (a) prosocial (church and volunteer); (b) team sports; (c) school involvement (pep club, student government); (d) performing arts (theatre, drama, band); and (e) academic clubs on each sex. Eccles and Barber, (1995) explored the links by which participants developed their identities as well as positive and negative life trajectories. This article also examined the possible reasons for such associations.

Eccles and Barber (1995) collected data from the Michigan Study of Adolescent Life Transitions (MSALT). This longitudinal study began in 1983 and tracked 6th grade participants for 13 years. The sample ($N = 1800$) was drawn from 10 suburban districts of Detroit. The current study used a sample of ($n = 1,259$), who completed the 6th (12th grade), and 7th (2 years later) waves of data collection. Rates of return were not mentioned by Eccles and Barber (1995). Sample selection was also unmentioned. Eccles and Barber (1995) used a survey interview. No mention was made of reliability or validity. Researchers described their survey instruments as, "detailed." Constructs of (a) Activity involvement, (b) Risk behavior, (c) Academic outcomes, and (d) Family characteristics were collected and analyzed.

Eccles and Barber (1995) used descriptive statistics and ANOVAs to analyze these data. Within and between group variance were calculated for group association and risk variables. Eccles and Barber (1995) also used longitudinal regression analysis in predicting the relationship between risky behaviors and the likelihood of sustained college attendance.

Eccles and Barber (1995) found that structured extracurricular activities had a positive impact on liking school, having a higher GPA and college attendance (1995). The activity that returned the strongest results for boys was team sports activities. Team sports also showed an increased propensity for risky behavior in alcohol consumption. This outcome held for both sexes. The females in performing arts drank more alcohol and skipped school more than the males. All prosocial participants tended to engage less in risky behaviors. School involvement activities predicted better than average GPA and college attendance. Risky behavior, when controlled for was held neutral. Expectantly,

academic clubs held the highest GPA and were most likely to go to and stay in college. Participants whose mothers had college education participated in activities twice as much as those whose did not. Students whose mothers had some college participated in structured extracurricular activities more than those who had only a high school diploma but less than those whose had a four year degree.

Eccles and Barber (1995) demonstrated that engagement in structured school activities acted as a benefit to participants. Regardless of the activity, positive effects emerged across the board. The research authors demonstrated that there existed some negative effects too, particularly drinking alcohol and skipping school. This type of activity was not evenly distributed across activities or sexes. Researchers also confirmed that young people engaged in some risky behaviors regardless of activity. Eccles and Barber (1995) elucidated the benefits to GPA and college attendance for all type of structured activities. Implications of this study clearly encouraged structured activity participation. Given that such benefits demonstrated as beneficial to all students, perhaps policy makers should consider program participation as a mandatory component of a general education. The study could have been improved if they had also included non-participants as a comparison group. Limitations of the study included the mostly White population and context dependency.

Community centers and IT programs that work. As proliferation of technology spread across societies, there existed pockets of poor who remained unable to grasp its benefits. Often times this happens because of simple access to such technology. Informal learning centers in the form of community centers were able to provide much needed technology and training to populations who benefited from such effort. This

study examined how residents of a poor community wanted to integrate technology and use it in their daily lives (Clark, 2005).

The research questions of interest to this author included:

1.   Based on the daily process of life the community, what are its needs, and can technology be use to meet those needs.

2.   What are the necessary factors surrounding the emergence of a self-directed learning community?

3.   What essential factors of instructional and technology were identified by the residents of the community?

Clark (2005) used an exploratory, case study design that employed a grounded theory approach. Grounded theory required four elements. First, grounded theory must fit the data and context to be of use. Second, understanding of a professional and a lay researcher was required. Next, generality should be that the case being studies should be applicable in other situations. Finally, the theory should provide a level of control regarding the action under investigation.

Sample participant included community members who frequented the community center. Various ethnic backgrounds comprised the study sample, including 29% African-American, 25% Asian, 18% African, 14% Caucasian, and 14% Hispanic. Approximately 50% of the samples spoke English as a Second Language (ESL). Sample consisted of individuals categorized as: (a) senior citizen, (b) adult, (c) high school, (d) middle school, and (e) elementary school. Of the sample of school age children, 78% qualified for free or reduced lunch program. Clark (2005) reported that 27% of participants older than 25

held no high school diploma. No mention was made of how this figure was obtained or verified.

An eight member team collected data via observation and unstructured interview. The researchers worked at the center as volunteers. Clark (2005) made no mention indicating participants became aware of the study. Researchers generated 211 passages over a 3 month period. Researchers recorded notes after their volunteer shift. Research data were kept confidential. By comparing researcher experiences with recorded data, themes and recurring patterns began to emerge. This activity comprised the only semblance of either validity or reliability measures.

Adult participants used the technology at the learning center for information attainment concerning housing, health care and child care. Secondary to these included education and entertainment. Education consisted of language training and skills attainment in order to obtain better employment. Entertainment often consisted of communication between local friends or with persons still residing in their home countries. A criticism of the technology was that often, local information was difficult to find or non-existent (Clark, 2005).

Youth participants used the technology primarily for recreation, communication and as a medium to explore social issues like, "sex education...bullying...and family life." Further topics included career, trust, relationships and gossip. Clark (2005) indicated that youth participants reveled in the freedom associated with navigating in an environment where, "free," or "straight" talk was possible. Such a platform, researchers concluded, helped young people make sense of their choices and lives.

Several factors contributed to the emergence of a self-leaning center: (a) information, (b) communication, and (c) education. These characteristics emerged after examining field notes. First, while local information was not always available, participants appreciated the ability to access what was available (Clark, 2005). A sense of community connectedness evolved from the access. Second, being able to communicate with friends and family in their home countries was significant for participants. Using the given technology, they could email, send pictures and video and engage in chat room activities. The final factor was education. Participants used education based software for academic English and Math as well as for ESL training. Participants enjoyed learning about the world and developing new skills.

(Clark, 2005) suggested that such centers greatly benefited to poor people. While technology was viewed as an efficient delivery model for learning, researcher discovered that it was the interaction with others, particularly for youths, that was most desired. This finding was in agreement with other poverty research (Payne, 2001). Researchers also noted the benefits of having a, "safe" place where self-esteem, empowerment, trust, education and hope flourished. This study confirmed existing research trends, particularly relating to social exchanges (Bishop, Tidline, Shoemaker, & Salela, 1999). The value of community driven programs for the poor was also confirmed (Ba, Culp, Gree, Henriquez, & Honey, 2001). Underplayed by (Clark, 2005) was the necessity for skill attainment to efficiently use provided technologies (Servon & Horrigan, 1997; Servon & Nelson, 2001).

Career and Technical Education Programs and Student Achievement

The previous section discussed various institutions that demonstrated promise. The following section addresses Career and Technical Education programs in particular. While Rumberger and Palardy (2005) gave us several school level, operating procedures that can greatly benefit students, the next study looks at student achievement at the program level.

Achievement. School level Career and Technical Education (CTE) programs endured often stigmatized status by perceptions of low achievement and academic quality (Elliot, Foster, & Franklin, 2005). Some argued that this situation was due to the overall quality of CTE programs. It was the purpose of this study to compare CTE student and non-CTE student performance on the Arizona high stakes test.

No explicated set of research questions contributed to this study. From the problem statement, however, this author inferred several primary questions.

1.   Do students with strong academic course work achieve at a higher level than those students who have a CTE background?

2.   What are the influences that may affect student scores? (ethnicity, SES, gender, parent's education, learning styles, etc.)

Elliot, Foster, and Franklin (2005) employed a conceptual framework drawn primarily from the work of Eisner (2001). The research authors used a comparative design with a control group and treatment. The treatment was CTE curriculum exposure. The sample ($N = 2240$) was drawn from 7 Arizona high schools located in 3 participating districts. The rate of return was not given by the authors; but, since it was a high-stakes

state administered test, this author inferred a very high return. Arizona Department of Education provided data for this study.

Rates of return and attrition were not mentioned. Male and female distribution was virtually even at 49.8% and 50.1% respectively. Of the 2240 participants, 2 failed to distinguish gender accounting for .1%. Participant race was primarily White 63.7%, followed by Hispanic 13.8%. The remainder of races included Multiracial, Black, Asian-Pacific Islander and American Indian-Alaskan individuals respectively. A large missing racial section of 9.2%, ($n = 224$) complicates the sample integrity. This was a longitudinal study with one year's data collected and analyzed. At ($p < .05$), results from 2000 to 2005 proved similar enough for the authors to generalize across years.

The data analysis used to explore the research questions included descriptive statistics, correlations and regression. The independent variable was CTE concentrator or non-CTE concentrator. The dependent variables under review included: gender, race, special populations, leaning styles, subject selection and population sampling procedure. No mention of validity or reliability measures was discussed by (Elliot, Foster, & Franklin, 2005).

Researchers demonstrated that it was the special populations (handicapped, limited English proficiency, economically disadvantaged and single parent status) that significantly associated with lower test scores. High kinesthetic learners scored far below visual and auditory learners. Black, Hispanic and Other male groups posted low test performance. Hispanic females also scored poorly.

Tracking, or grouping by ability or interest was an activity prolific in the United States (George, 1993). This study effectively demonstrated that once the special

populations were controlled for, there existed no significant difference between the scores of CTE and non-CTE tracked participants. CTE programs drew large numbers of special group students. Because of this, CTE program participants at the raw score level always performed more poorly than academically tracked students. It should be noted that it was the populations served, and not the curriculum, that needed controlled for. Students who did not have CTE programs to participate in may be more prone to dropout activity. School leaders and administrators who fully understand the extraneous variables demonstrated by the special groups were well positioned promote quality programs as well as discourage misinformation.

Technology integration standards. The students who attended America's schools changed dramatically over the past few decades. Changes occurred in curriculum, school size, administrative practices and accountability (Cuban, 2003; Hunt, 2008; Elmore, 2003; Rumberger & Lamb, 2000; Calkins, Guenther, Belfiore, & Lash, 2007). Also fair to say, pedagogical practices and tools used by teachers also changed (Barron, Kemker, Harmes, & Kalaydjian, 2003). Barron, Kemker, Harmes, and Kalaydjian (2003) worked to determine the extent of teacher use of technology as a tool for student achievement and education. Specifically, this study examined technology as a classroom tool for research, communication, productivity and problem-solving.

Barron et al. (2003) included no section outlining clear research questions. From the results section, however, questions interesting to this author evolved:

1. What teachers from which levels are using technology as a classroom tool and with what frequency?

2.   Who and how often are teachers using technology in problems solving

      activities?

3.   Who and how often are teachers using technology as a classroom research

      tool?

4.   Who and how often are teachers using technology as a classroom

communication tool?

Barron et al. (2003) used a comparative design. The study used national, and one

large Florida district surveys, as a source from which to collect data. No mention was

made of sampling method decisions, or of rates of return. This study listed several levels

of classroom implementation standards from various sources. The literature review was

extensive and thoroughly dealt with three model studies completed previously. Barron et

al. (2003) used results of the preceding studies in comparative models with data from the

current study.

The sample ($N = 2,156$) for the Florida district consisted of 17% male, and 83%

female respondents. The survey instrument was modeled after instruments used

previously by: the 2000 Consortium on Chicago Schools Research, the 2000 Center for

Research, the 2000 Information Technology Organization study, and the 1999 National

Center for Education Statistics study. Barron et al. (2003) sent a four page questionnaire

or a Web based questionnaire to every teacher in the school district. The instrument was

assessed by experts in measurement and technology and declared valid and reliable. The

schools selected to receive the Web survey were randomly selected and represented about

20% of the possible participants.

Barron et al. (2003) set significance level for this study at (p < .05). A Cronbach's alpha was calculated for each part of the survey and results were consistently in the mid 80s (r ≥ .80) or better. Some of the data sets collapsed into frequencies of once a week computer use or not once a week computer use. Chi square analysis was used to compare the different levels of schools, elementary, middle and high for independence. Significant levels of difference were found for three areas and across school levels, problems solving, communication and research.

The differences became apparent when one looked at subject matter differences. Barron et al. (2003) demonstrated that science teachers used computers as research tools at a frequency three times greater than math teachers. English teachers were over twice as likely. In the areas of problem solving, the proportions of teachers using computers in this area included: science teachers (28%), social studies teachers (23%), math teachers (17%), and English teachers (10%). As productivity or communication tools, no statistically significant difference existed between subject matter groups. Science teachers, however, got the most use out of computer technology across content and education levels.

Barron et al. (2003) suggested that either technology was not readily accessible to teachers or teachers found computer use uncomfortable. Either way, this finding became a resources distribution question for school administrators. If school districts wanted teachers to use technology based teaching and learning practices, then monies for procurement and training necessitated such activity. Another implication was, given that some teacher groups use more technology, did they prove any more successful than other

disciplines? Also, were tech savvy teachers any more effective than traditional teachers within their perspective disciplines?   More research in this area may yield useful results.

Information technology teacher training. Technology had infused and permeated education conversation and practice for over 20 years. It remained, however, an ever present problem that students continued entering into universities and post-secondary life in possession of inadequate technological knowledge and skill. This situation was extended and exacerbated by existing teacher education programs that frequently turned out yearly crops of technologically inept, educators. This study examined the technological skill of students entering and exiting from one Midwestern university's teacher education program.

Sveum (2010) used the language of research objectives to guide his study. Adapted to fit the interests of this author, the following questions became useful:

1.   What are the technical competency levels of participants entering the studied teacher education program?

2.   What are the technical competency levels of participants leaving the studied teacher education program?

3.   What educational experiences lead to the development of technological skill in participants?

This study used a comparative design. Sveum (2010) used performance based data and examined the technological skill of participants ($N = 48$). The researcher used convenience sampling. Data used in this study was gathered using the Certiport ® IC3 exam. The exam was developed by the SkillCheck and Donath companies; each were considered industry leaders with many decades of psychometric and evaluative research,

consulting, test construction, measurement and statistical analysis. The IC3 tests represented an industry standard and valid instrument for assessing basic technological competencies. Cronbach's alpha determined reliability which measured ($r = .88$) or better for each test type. Sveum collected further data by development and administration of a survey (2010). This instrument was author constructed. Although the survey was reviewed by program specialists, reliability measures remained absent, a weakness of the study.

Data analysis included descriptive statistical measures, frequencies, Mann-Whitley U tests, Chi-Squared Tests for Independence, and the Kruskal-Wallis H Test. The results of this study aligned with relevant literature. Only 17% of incoming freshman achieved competency in the area of technical literacy. Adversely, 48% of graduating senior education majors certified as technically literate. A wide variety of activities accounted for the range of performance. Most notably, Sveum (2010) detected that Senior participants, ($n = 25$) lacked formal technical training in their curricular program. Activities like observation, seeking out knowledgeable people and experimentation ranked highest in their skill attainment activities.

The implication of this study suggested that serious work needed to occur to prepare new teachers for the challenges of the modern educational milieu. If education authorities expected teachers attain and maintain technological expertise, then such grounding must begin at the teacher preparation level. Such expertise may then translate into improved student achievement via enhanced use of existing technologies. Sveum (2010) could have improved this study by using a larger sample, more rigorous statistical analysis, inclusion of qualitative methods and a survey instrument with proven reliability.

School to work programs. Numerous studies examined the effects of Head Start. There also existed some studies on High Schools that Work (STW). Few studies, however, examined the relationships between these two programs. This study assessed the effects of Head Start participation as it related to recorded academic ability during elementary school and the effects on STW programs participation (Caputo, 2003).

The research questions dealt with by this study were explicated by Caputo:

1.　　What is the likelihood that STW programs attract students who had lower grades in grammar school?

2.　　To what extent do STW programs attract student who had enrolled in Head Start and who also had lower grades in grammar school?

3.　　How do Head Start participation and later socioeconomic status affect STW participation?

4.　　How do sex and race/ethnicity affect the likelihood of STW participation by demonstrated academic ability?

Although not explicated by Caputo, the research design of this study used a secondary analysis of the National Longitudinal Survey of Youth 1997. Caputo (2003) did not make clear any premise prior to data analysis. This strongly implied an inductive approach was taken, even though, such explication was not present.

The research questions guided sample selection. For example, the original sample pool was ($N = 8,984$) which comprised a national sample of male and female participants from 12 to 16 years old. The sample ($n = 4,370$) included a subset ($n = 2,963$) which contained parental Social Economic Status (SES). These data answered research

question #3. The larger sample was used with the remaining research questions. This study analyzed secondary data; sample selection was not discussed by Caputo (2003).

Research variables included race/ethnicity, grade point average (GPA), class retention status, sex, grade level, Head Start participation status, STW status, parental SES status, public or private grade school attendance and high school curricula track. The possible tracks included: College Prep, Academic and Vocational Combination, General Program and Vocational.

Data analysis included Chi-square analysis used to examine bivariate relationships. Several logistic regression models analyzed possible predictors. Several multiple regression statistical tests contributed to the study. Significance was set at ($p <$ .05). Two models contributed to the study, a base model and an expanded model. Hosmer and Lemeshow Goodness-of-fit Tests helped place values into the most appropriate models.

Caputo (2003) indicated higher SES families tended to not use Head Start services. This was reflective of the literature and expected. Interestingly, however, SES status had no preference for STW participation. No statistical difference existed between students who had good and poor grade performance in middle school and STW program participation. Participants who failed to matriculate grade level in middle school proved as equally likely to participate in STW programs as non-retainers.

Ethnicity for female STW participants was not significantly different; but, it was different for males. College Prep track White males participated significantly less than the other groups (Caputo, 2003). That is, Blacks and White females of all tracks proved

70% more likely to be STW participants. All other gender and track comparison failed to attain statistical significance.

If public support was required to maintain this program, a more equitable ethnic distribution was expected. Also, there may be unpredicted benefits of program participation in that more students may be sticking with school, (rather than dropping out) in order to partake in STW programs. If a proven relationship existed, programs expansion may be warranted. More research is needed to fully understand these events.

IT certifications bridge a pathway to post-secondary success. The entity of Information Technology (IT) certification partnered with business and industry just prior to the early 1990s. Much about the IT certification remained misunderstood by academia, labor and industry. Shore (2008) outlined a brief history and summary of relevance about the IT certification.

Shore (2008) generated an IBM internal report commissioned by IBMs E-Business Certification Manager; it was theoretical. Shore (2008) employed a report design suited to the internal workings of IBM. There existed few of the design elements common to many research works. This study, however, proved useful in understanding the relationship between large IT corporations, academia and labor. The questions of primary interest to this author included:

1. What is the street cost of obtaining IT certifications?

2. What are the benefits of obtaining IT certifications?

3. What is the nature of the relationship between the IT industry and Academia?

IT training existed as a huge industry. Traditional colleges and universities, specialty schools, two year colleges and private organizations competed for students to enroll. The purpose of such training translated into work for the candidate, higher wages and a better quality of life. Certification status was nothing new to American culture (see also Csapo, 2002). Many professionals must first pass some sort of certification before they practiced (i.e., BAR exam, CPA exam, Registered Nursing Boards). This most recent wave of standards-based technology focus was launched by Novell in the early 1990s. Novell was in the business of providing IT solutions and enjoyed bountiful success in its early stages. A problem, however, quickly arose. Novell products took a great deal of skill to configure and maintain. After selling a system, Novell found that few customers held the skills required to run and maintain their computing hardware and software. Customer service represented a poor and expensive alternative. Novell's solution launched a model that was copied by dozens of IT industry entities. Novell provided training material to third-party education institutions while they controlled the cognitive and performance assessments. While cognitive knowledge was valued; however, a candidate must prove proficiency in solving real world problems to become certified. Certified graduates of the Novell system engineers quickly found lucrative work. This model propagated and promptly became the new training standard for companies like Microsoft, Banyon, Cisco, AT&T, Compaq and many others (Shore, 2008).

Three characteristics of certification have lent strength to its popularity. First was Validity. IT certification tests were notable in that they test exactly to a standard. Much effort went into mapping test questions to skill sets. Complex demands of certification

required the candidate to problem solve by drawing on a wide range of disciplines (Shore, 2008).

Second, consistency contributed to another major component of IT certification exams. This author would like to substitute the language of reliability as being synonymous. Although tests ask different questions to different candidates, the standards remain the same. Huge amounts of time, effort and money are invested in the testing psychometrics (Shore, 2008).

The final element of IT certification tests was fairness. Any person, regardless of race, or gender, or religion, or even educational attainment could sit for an exam. This fact alone contributed to the IT certification popularity worldwide (Shore, 2008). Candidates knew that with certification in hand, a better, more lucrative future became a possibility.

The relationship between the IT industry and academia existed as tumultuous and often contemptuous. Industry liked broad based training that traditional academia provided. Experience too, however, was much coveted. Companies like Cisco, Microsoft and Novell became de facto universities in themselves (Shore, 2008). While colleges and universities scrambled to provide more experience-based learning, the non-traditional and international learners moved to fill the void left by the dearth of qualified applicants.

The implications of this work suggested that a closer relationship need develop between academia and industry. An important lesson, however, should be learned by all institutions of higher learning. The keys to lucrative IT jobs exist within the reach of not just the post-secondary graduate. Competition for full classrooms of the brightest will

grow fiercer as many individuals choose to forgo a formal education. These new labor professional found a quick and often lucrative path via IT industries that was nonexistent two decades prior. In today's super- competitive business environment, all industries need an e-business to juxtapose its traditional markets. The need for qualified, efficient and effective IT professionals will only continue to grow. If academia cannot fill the need, independent IT certification will surely make the effort.

Certifications of Value

In the previous section, a review of literature concerning CTE programs was made. In the following section, the focuses on the attainment and value of IT certifications.

The certification system in information technology. This study examined the little understood world of Information Technology (IT) certifications that existed outside of traditional colleges and universities. A second purpose was to examine the global nature of such activity, the providers, developers and students.

The questions involved in this research were embedded within the study. No clearly defined section of questions existed. Within the text, however, several subjects of interest to this author emerged:

1. Who are the industry vendors?

2. What is their range and scope?

3. Who is getting certified?

4. How many certifications exist?

5. What is the relationship to government oversight?

6.   What does this movement mean for traditional institutions of higher education?

This report used a mixed method, case study design. The researcher also employed action research methods. This study built a synthesis from primary and secondary data sources. Adelman (2000) benefited from access to primary or internal data reported from companies that included Cisco, Microsoft, Novell and Oracle. Adelman used the study to develop and support themes relevant to the topic of international IT certifications and how such themes affected industry and academia.

Adelman (2000) collected data qualitatively from interview and conversation. Information Technology certifications tests provided numerical testing scores. Such activity supported the action research design previously mentioned. Finally, data were collected from various testing companies and vendors. In this area, data collection was admittedly incomplete; access to international records dealing with IT certification activities, standardization practices and accessibility proved problematic.

Adelman (2000) provided only cursory examples of data manipulation. The study was, however, filled with tables and graphs that reflected various examples. No mention of reliability or validity was present in this report. Adelman (2000) used constant comparative analysis to generate themes and identify patterns. Sampling decisions, sample returns and attrition remained absent from this work.

Adelman (2000) defined many aspects of international IT certification activity. This study also identified major vendors associated with certification. Adelman demonstrated industry detachment from government regulations. Such regulations restricted many post-secondary universities, colleges. The roles of industry and testing

partners continued to clarify and expand. What remained unresolved, however, was how traditional institutions stayed relevant, particularly within the upper echelons of the IT worker microcosm. Adelman (2000) argued the IT certification industry retained the ability to stay more current, relevant and solvent than traditional institutions. Adelman also discussed the need for alternative models or alternatives to traditional forms of higher education. This study lambasted institution centered learning, Adelman demonstrated how a handful of vendors and partners, along with a world-wide classroom of nebulously characterized students, had created a system of higher learning that was in many ways superior. That system created a much more market responsive and reflexive learning environment than the ivory towers of traditional academia.

The implications of this study suggested that if traditional institutions of higher education wanted to stay on the cutting edge of IT development, then close collaboration with the power players of the IT world were not only desirable, but indispensible. Such thinking represented a shift in traditional educational and collaborative patterns used by most universities. If universities wanted access to the best students and resources, a change in the way they recruit, research, fund and collaborate proved critical.

IT training and certification. A great multitude of industrial jobs moved away from American shores. This was due to outsourcing activities by American firms (Friedman, 2006). Up to ten times more potent was the continued passion for efficiency which replaced human labor with automation, (Rifkin, 1995). One bright spot in the American labor market, however, recently emerged. Information Technology (IT) and its peripheral, highly specialized fields continued to grow (CompTIA, 2009). This study

examined the motivations and activities of persons who pursued industry standard, IT certification training.

Of interest to this author, four primary research questions guided this study:

1.   Why do people obtain an IT certification?

2.   What steps are involved in training and preparing to sit for an IT exam?

3.   What are the pros and cons of obtaining an IT certification?

4.   What comprised the experiences of those who pursued IT certification, but did not achieve it?

This study used a survey design. The sample of ($N = 1,537$) IT industry professionals came via the CompTIA certified candidate database, Luth Research IT panel, Global Knowledge and Hewlett Packard (HP). No mention was made about sampling methods other than Luth's participants were chosen randomly. Most of the participants possessed citizenship of the U.S., Canada, or the United Kingdom. Participants from other countries contributed to the sample in a, "lesser extent" (CompTIA, 2009). The actual sample statistics remained undiscussed. Since participants already worked in the IT industry, the sample was vulnerable to sampling bias. This was mentioned by the authors as a threat to validity. The researchers used the language of sampling confidence of 95% that described sampling error. Their attention to reliability was limited to, "precautionary steps were taken in all phases of the survey design, collection and processing of the data" (CompTIA, 2009). Rates of return figures were not provided. Simple measures analyzed and described the collected data, primarily in the form of percentages.

The findings of key interest to this author demonstrated that individuals invested a large amount of time, effort and money in obtaining IT certifications. Certification pathways offered a real and often strode avenue of attaining employment. For many individuals, such methods of attaining skill occurred outside traditional academic models. For example, 44% of participants held no four-year degree. Many IT professionals had backgrounds in non-related fields (language, arts, or communication) and took certification training to change or advance their careers. Interestingly, different certifications required different amounts of input. Correspondingly, the return on investment (ROI) also proved different for each certification and individual. Expectantly, those individuals who worked during their peak earning years, (20+ years of employment) received the greatest ROI (CompTIA, 2009).

The motivations to obtain IT certifications topped out with economics and personal growth. Desire of job flexibility, advancement and stability contributed too. Motivations translated into an average of over 44 hours in preparation to take an exam. Over 80% of participants indicated that certification training helped them in performance of their daily jobs (CompTIA, 2009). While cost was a contributing factor to the method of training participants chose, a much greater number of participants desired the flexibility of non-traditional or out-of-class type instruction. Such instruction included books, manuals, practice tests, preparation software, Internet based or distance learning.

The implications of this study informed the educational conversation about IT in a variety of ways. Given the IT industry remained one of the few labor markets that proved steadily growth, greater attention, effort and resources should be allocated to the cultivation of IT professionals via certification programs. Third-party certification placed

150

a stamp of approval that verified ability to a degree unmatched by any academic grade (Adelman, 2000; CompTIA, 2009; Shore, 2008). As a greater number of young people forgo traditional college for technical training, (Adelman, 2000) it made greater sense to develop IT certification programs in high schools. Such programs could certainly bolster a much needed, skilled labor force. In this regard, international competition enjoyed many advantages over the U.S. (Smith-Mello et al., 2008). Domestic policy makers and educators should jumpstart students, academia and industry by fully supporting and developing such programs. Since the economic shift from production to innovation (Rifkin, 1995), few savvy stakeholders recognized the curricular lag, (Cuban, 2003) exacerbated by archaic practices and policy.

Inconsistencies pertaining to certification value perceptions. In the Information Technology market, Network administrators remained in high demand (Cegielski, Rebman, & Reithel, 2003). All manner of companies required qualified Network professionals to manage their data and resources. Given there existed a proliferation of certified and uncertified network administrators, little was known about the end-users perceptions of differing ability of these two groups. It was the purpose of this study to assess the popular industry assumption that certified network professionals proved more adept managers of network resources than uncertified individuals.

The following section listed the null hypotheses:

H1)   The mean end-user-perceived usefulness of a local area network administered by a certified network professional does not differ from the mean end-user-perceived usefulness of a local area network administered by a non-certified network professional.

H2)   The mean end-user-perceived ease of use of a local area network

administered by a certified network professional does not differ from the

mean end-user-perceived ease of use of a local area network administered

by a non-certified network professional.

This study used a mixed method, quasi-experimental design. Researchers used

previously developed Likert-type survey instrument, (Davis, 1989) as well as interview

for data collection. The research sample ($N = 299$) participants drawn from 11 separate

financial firms located in the Southeastern USA. Cegielski, Rebman, and Reithel (2003)

classified samples into: (a) administrative support, (b) customer service, and (c)

transactions processing. Interviews and observations confirmed that each participating

groups demonstrated themselves homogenous in regard to technology access and use.

Scale reliability tested ($r = .98$) for perceived usefulness and ($r = .94$) for ease of use.

Scales proved convergent with correlations of ($r = .63$) perceived usefulness with usage.

Also, perceived ease of use with current usage ($r = .45$). Rate of return and sample

integrity were not discussed by Cegielski, Rebman, and Reithel (2003). Of the 299

sample, 173 used certified professionals to manage network activity.

The primary tool used for data analysis was MANAOVA. This study set

significance at ($p < .05$). The power computed for each test exceeded .995. The results

of this study indicated that end users detected no difference in usefulness or ease of use

for either certified or non-certified network systems at the ($p < .05$) significance level

(Cegielski, Rebman, & Reithel, 2003).

The implications of this study suggested that industry's valuation and reward

system for certified employees may not be warranted. Given the shortage of network

professionals, an alternative measure of skill may be more advisable. Limitations of this study included the use of Novell and Microsoft certified personnel only, as well as linear sampling of the financial industry. A study design unmentioned by the Cegielski, Rebman, and Reithel (2003) might be to sample only personnel who have experienced both certified and non-certified network administrators in their careers. More research will be required on this topic as the network information technology service industry continues to grow.

Certification perspectives of human resource and IT managers. There existed an ongoing conflict between human resource managers and Information Technology (IT) supervisors in regard to the hiring and compensation of modern IT workers. This study explored the perspective of the Human Resources (HR) manager toward IT certifications.

Five questions addressed this phenomenon. The research authors, Anderson, Barrett and Schwager (2002) used the language of study objectives. All questions related directly to the perceptions of Human Resource managers:

1. Determine the value of IT certifications to HR managers relative to formal education and experience in the hiring decisions of IT professionals.

2. Determine the organizational benefits of a certified IT staff from the perspective of HR managers

3. Determine the employee benefits of IT certification from the perspective of HR managers

4. Determine the relative credibility of IT certification as compared to other certification in business and industry from the perspective of HR managers.

5.   Determine whether HR managers prefer theory-based education or

application-based education and whether certification should be part of an

Information-Systems curriculum.

Anderson, Barrett, & Schwager (2002) used an exploratory, case study. The

authors made study design clear on several occasion. Although there existed peripheral

studies on IT managers, little was known about other administrative groups. The study,

therefore was exploratory rather than confirmatory. Because researchers addressed a gap

in the understandings of scholars about perceptions of HR managers, they contributed to

the understanding of an emerging field. It is a case study model because the authors

examined a single, bound phenomenon.

The data contained within this study generated models after a 2001 CompTIA

survey of IT managers and certified professionals. Little was mentioned about the survey

design other than it used scenario questions, benefit factors, comparison questions and a

dichotomous, (yes or no) agreement scale. Anderson, Barrett, and Schwager (2002)

mentioned nothing about reliability, validity, rates of return or attrition. The sample for

this study was drawn from two North Carolina chapters of the Society for Human

Resource Management.

The data analysis used in this study included simple descriptive statistics

including N = number of participants; M = means, SD = standard deviations and ratio

statistics in the way of percentages. The study used several graphs and tables to augment

text discussion. From the gathered data, several themes emerged.

The HR managers of this study viewed IT certifications much like the employees

who held them. However, this position was in contrast to IT managers who viewed

154

certifications as less desirable than either broad based university training or experience. Human Resource managers held that attainment of certifications improved the quality of work life for the employee and provided an avenue for increased security (Anderson, Barrett, & Schwager, 2002). Finally, HR managers viewed certified individuals to offer superior perceptions of credibility and held a similar status to certifications of a business nature, i.e., Certified Public Accountant (CPA). These finding proved consistent with related and emergent literature.

The implications of this study suggested a balanced approach to the hiring and compensation practices often used by IT and Human Resource managers. It was argued that the IT supervisor was more likely to understand the needs of the IT position; it was equally well argued that the Human Resource manager understood the value of hiring and retaining certified individuals outside the direct sphere of IT work. Public perception and sales provided examples of these areas. This type of turf war remained common in the IT industry. More research may prove to yield much sought after, yet elusive answers.

Synthesis and Grounding of the Study

The following syntheses are taken from the four sections of this chapter.

Synthesis: Section 1- Reform's Broken Promise

The major themes discussed in this section revealed themselves into several patterns. First, political actors often made laws surrounding issues they neither understood nor were willing to learn (Cuban, 1993; McDonnell & Elmore, 1987; Shannon, 2005). This negligence was exacerbated by a clearly demonstrated distain for implementation (Brown-Collier, 1998; Cuban, 1993). As these programs began to crumble, political actors came to the rescue by allowing reasonable changes made to bad

155

laws (Kannapel, 1997). Poor planning and worse implementation proved inconsistent with the social contract.

Many scholars argued that although programs may not have succeeded in their stated goals, they still moved society toward a desired goal (Brown-Collier, 1998). This point of view was equally criticized in that such programs often created as many new problems as they fixed (Tyack & Cuban, 1995). Lack of appropriate planning and more importantly, weak implementation, oversight and adaptability (i.e., Great Society, War on Poverty, NCLB) was nothing short of tragic.

Second, it was increasingly rare for policy makers to use any method other than cheap, quick and ineffective mandates to bully educators into adopting what seemed often impossible goals (Elmore, 2003; Shannon, 2005). By ignoring alternative policy instruments, such reforms often proved doomed from the start due to lack of funding, capacity, skill and even motivation (Elmore, 2003; Hunt, 2008; McDonnell & Elmore, 1987).

Third, reform took shape in curricular manipulation (Cuban, 1993). Such curricular "tinkering" confused stakeholders. Juxtaposed with such confusion was the inability to build capacity. Initiatives were often not given a chance to bear fruit prior to the next batch of mandates and reforms (Elmore, 2003). A much more efficient manner of change existed in the forms of inducements and capacity-building policy mechanisms (McDonnel & Elmore, 1983). The use of these policy instruments, however, proved expensive. The results of such investment rarely were seen during the span of one political term. Unfortunately, it remained much easier to make haphazard adjustments to curricula than to institute real, sustainable reform (Kannapel, 1997).

Finally, constituents remember reform promises and broken promises alike (Brown-Collier, 1998). When reform promises were broken, an additional burden was added to the already heavily laden poor (Brown-Collier, 1998; Moynihan, 1965; Wilson, 1996). Due to irresponsible planning and implementation, the groups targeted to elevate out of miserable poverty, illiteracy and detachment proved the very same who continued to flounder in times of adversity (Moynihan, 1965; Orthner, Cook, Rose, & Randolph, 2002; Shannon, 2005; Vitaro, Larocque, Janosz, & Tremblay, 2001; Wilson, 1996). The disenfranchised and most vulnerable lost even more faith in the promises of a better future (Moynihan, 1965; Wilson, 1996).

Not only did the poor suffer from broken promises, everyone did. Children and adolescents represented the most susceptible group by far (Dunst & Trivette, 1992; Garbarino, 1995; Payne, 2001). Teachers, administrators and parents, tired and calloused from the unending flow of reform, lost much faith in the process (Tyack & Cuban, 1995). Lost faith was not the worst of it. Critical analysis showed that the most recent reform effort (NCLB) may have been designed so that all struggling schools will purposely fail (Shannon, 2005). Such failure, therefore, would precipitate reconstitution and takeover (Shannon, 2005). NCLB may be accurately viewed as a vehicle for ushering in mass privatization of education. Little to no evidence existed that demonstrated the ability of private industry to educate beyond public norms, particularly with High-risk populations (Shannon, 2005). The flow, structure and purpose of contemporary education policy making proved unstable.

Synthesis: Section 2- Short on Time, Long on Trouble

The previous section examined reform's failure to live up to stakeholder

expectations. The following section examines some of the issues relevant to education.

First, while policy tools were clarified for administrators and lawmakers, the

range and direction of those tools often made little sense (McDonnell & Elmore, 1987).

The frequent use of mandates opened a host of other troubles (Cuban, 1993). What laws

were passed in federal and state legislatures often had little to do with what actually

occurred at the classroom level (Cuban, 2003).

Poverty levels and economic indicators in the U.S., it was argued, proved

catastrophic compared to previous decades (Friedman, 2006; Rifkin, 1995). Much

poverty resulted because of loss of low skilled manufacturing jobs due to automation

(Rifkin, 1995). The urban ghetto had more in common with war torn, third world

villages than the thriving metropolises of the not-so-distant past (Wilson, 1996). Given

the fact that various forms of welfare continued to increase, (Orthner, et al., 2002;

Western, 2000) while High-risk groups continued to eschew educational achievement or

living a *straight* (non-criminal) life (Wilson, 1996), a change in business as usual for

educators, administrators and policy makers was perceived as long overdue (Cuban,

2003).

Second, dropout rates for the general population had improved slightly at best and

remained flat at worst (Heckman & LaFontiane, 2010). For ethnic sub-groups, Black and

Hispanic males in particular, education continued to fail the relevance test (Cairnes et al.,

1989; Heirvel & Wright, 2005; Wilson, 1996; Vitaro et al., 2001). The "siren song" of

street life, easy money and freedom from institutional pressures often proved too

158

seductive to resist (Heckman & LaFontaine, 2010; Herivel & Wright, 2005; Wilson, 1996). Rural adolescents shared a burden of risk as well (Okey & Cusick, 1995). Moreover, family life for the poor often existed as more of a hindrance than a support (Okey & Cusick, 1995).

A wide range of dropout discrepancies existed due to various data set and methodological choices (Heckman & LaFontaine, 2010). The data choice and methods used often reflected some sort of prior bias. After removing much of the bias, however, it was determined that not much had changed in the past 40 years in regards to dropout activity (Heckman & LaFontaine, 2010). Minority males, however, remained most susceptible to dropout pressures (Vitaro et al., 2001; Wilson, 1996). Regardless of the methods used to calculate dropout activity, researchers tended to agree that High-risk groups remained in more trouble and were afforded less opportunity today than any other time in the modern age (Cairnes et al., 1989; Heckman & LaFontaine, 2010; Heirvel & Wright, 2005; Wilson, 1996; Vitaro et al., 2001).

Third, not only were the High-risk groups being out-worked, out-thought and out-performed on virtually every academic measure, so too was the general US population (Friedman, 2006; Smith-Mello et al., 2008). International academic testing put the American 15 year old near dead last in achievement versus all other industrial countries (Achenbach, 2003; Smith-Mello et al., 2008).

High-risk individuals remained in competition with themselves and their domestic colleagues, (Rifkin, 1995) competition from abroad quickly chipped away what small opportunity existed (Friedman, 2006). Poor academic performance by American adolescents, particularly in Science, Technology, Engineering and Mathematics (STEM)

areas precipitated an influx of highly skilled, highly trained, foreign workers. Also, academic dearth had exacerbated U.S. corporate and industrial exodus (Friedman, 2006).

Finally, more meaningful programs proved essential to reach modern levels of required literacy (Carvin, 2000). Teachers, administrators and politicians were called to concede what has been outlined by researchers. A better, more efficient, more relevant way of educating High-risk individuals required development if such individuals stood even a gamblers-chance of avoiding negative life trajectories (Clark, 2005; Kay & Honey, 2005).

Promising studies demonstrated that older individuals gained basic technological competencies (Alkalia & Chajut, 2009). The same study, however, detected that adolescents worsened at higher level thinking and problem solving (Alkalia & Chajut, 2009). This finding was supported by similar studies that called for broad based technical training standards (Kay & Honey, 2005). Such training tendered promising results in development of higher level and problems solving skills (Kay & Honey, 2005). Basic, Functional and even Occupational literacy levels proved inadequate for the modern age (Carvin, 2000). Adolescents continued training to develop the ability to discern information quality via Information Literacy (Carvin, 2000). Automation and work efficiency expanded in previous decades. This trend was expected to improve and expand in the coming decades (Rifkin, 1995). All members of society were expected to obtain and maintain Technical Literacy (Carvin, 2000; Kay & Honey, 2005). Workers remained encouraged to obtain skills and technology aptitude at the adaptive level so that retraining downtime remained minimal; Adaptive Literacy continued to gain importance (Carvin, 2000).

Companies including Dell, Microsoft, Citibank, Goldman-Sachs, Ford and Union Carbide set clear precedent (Friedman, 2006). If schools failed to educate the masses to a desired level, the market responded by accelerated immigration and exodus. While the modern world moved at the speed of light; the High-risk individual remained stuck in the illiterate, dismal, cyclical pit similar to the experience of the "sharecropper" (Rifkin, 1995).

Synthesis: Section 3- Reaping What Was Sown

The previous section reviewed the current state of affairs regarding several of the fields surrounding education. This section discusses a theoretical grounding useful in understanding this work.

First, schools remained open systems that existed, in many ways, unique among the institutions studied by Organizational Theory. All opens systems, however, shared most of the features defined by Katz and Kahn (1966). Organizations, according to Katz and Kahn may be classified by the stability of: (a) energetic inputs, (b) transformation of energies, and (c) the resulting product or energetic output (1966). While it was often the case that organizations vacillated though periods of activity, organizations that cannot sustain stability terminated (Katz & Kahn, 1966). It was also useful to refine the ideas of output as sustainable or cyclical to the nature of inputs. On one hand, the open-system model often appeared counterintuitive; open systems, however, proved a useful way to view organizational structure, function and activity. One the other hand, it was argued by Tyack and Cuban that much of the education reform effort in the past several decades was an activity in outright deception (1995). Ideological smokescreens were used to camouflage or deflect attention away from governmental mismanagement in extremely

161

difficult or controversial areas. Domestic issues like crime, unemployment, economics, deficit management, fiscal and monetary policy and race relations were never easy issues to resolve (Rifkin, 1995; Wilson, 1996). Tyack and Cuban posited that much of the education reform of the past 60 years contributed to an "ideological smokescreen" (1995, p. 34).

While attention was focused on impotent educational reform, the modern, technological age arrived; the nature of work changed (Friedman, 2006; Rifkin, 1995). The rate of this change was not summative or multiplicative, but exponential. The loss of jobs, particularly low skilled, repetitive manufacturing jobs, changed the way citizenry viewed the social contract (Friedman, 2006; Rifkin, 1995; Wilson, 1996).

Current levels of unemployment resulted from the multiplicative combination of automation, outsourcing and cultural detachment (Friedman, 2006; Rifkin, 1995; Wilson, 1996). Combined with urban poverty and its characteristics, the level of unemployment for unskilled labor exceeded historic levels (Payne, 2001; Wilson, 1996). High schools retained a dismally poor track record of providing opportunity factors (Dunst, 1993; Garbarino, 1995), particularly for High-risk individuals. As a society generally and the education profession specifically, leaders provided High-risk individuals few options other than a welfare check, unemployment line and prison term (Herivel & Wright, 2003; Rifkin, 1995; Wilson, 1996; Wolcott, 1983). Many employees in India and China (and other developing countries) thankfully worked for as little as $100 per month; such a standard may have proved laughable to the illiterate, disenfranchised, unemployed, American (Friedman, 2006).

Second, there existed compelling evidence that the psychological health of children ran in patterns closely linked to the economic health of a society (Achenbach, Dumenci, & Rescorla, 2003). Garbarino (1995) suggested that no child was immune to negative cultural influences. All American children remained At-risk. This theory was strengthened by the work of Dunst & Trivette (1992) and Dunst (1993). Garbarino's Social Toxicity theory allowed that many layers of risk were often counterbalanced by factors of opportunity. The equation demonstrating this concept followed: -1-1-1 + 1+1+1 = 0. If such an understanding, combined with enhancing or refining theory (Social Cognitive theory and Social Exchange theory) were taught to persons involved with High-risk children, a powerful tool would be place exactly where it could be best applied to help those most High-risk individuals.

Positive life experiences within and outside the family proved critical, particularly in the positive development of At-risk and High-risk children. This theory was supported by work of Eccles and Barber (2000) in that positive activities (often school based) had a profound and often lasting effect, particularly with At-risk and High-risk individuals. Externalities in the form of risk behaviors often accompanied school-based activities. Benefits, however, far outweighed risks according to researchers.

The opportunities for the dropout, however, proved quite limited. Individuals who dropped out of high school were much less engaged in the economy at ages 19-20 (Rumberger & Lamb, 2000). The socially toxic nature of American society often allowed or pushed young people into a life for which they were completely unprepared. Well represented by the studied dropouts, immediate gratification and sloth usually replaced characteristics of hard work, persistence and patience. Such characteristics

163

often typified the High-risk individual (Cairns, Cairns, & Neckerman, 1989; Moeckly, 1992; Payne, 2001; Western & Pettit, 2000).

There appeared to be four favored indicators for At-riskness. These four characteristics were often used to measure At-risk characteristic because they proved easily quantifiable. These four components included: (a) poverty, (b) minority status, (c) single parent household, and (d) parental levels of education. While these four often proved the most *convenient* measures, little evidence indicated they represented the most *accurate* predictors of negative life trajectory (Moeckly, 1992; Payne, 2001; Shannon, 2005). Defining what At-risk status was greatly depends upon the "lens" one used.

Finally, Social Exchange Theory made use of different structures to produce different emotional and cohesive results. Power levels often determined which structure was most appropriate for groups (Lawler, 2001). At the core of social exchange theory, however, stood the idea of Reciprocity (Gouldner, 1960).

The implications of reciprocity informed Social Exchange Theory in several important ways. It was well documented that while poor people often lacked financial resources, they absolutely understood and depended on the rules of reciprocity (Payne, 2001, p. 37). Across all social strata, reciprocity was understood formally or at least tacitly. Such reciprocity often proved to be a vital component in generating friendships (Bernt & Keefe, 1995; Lawler, 2001).

Friendships frequently took on the characteristics of being positive or negative (Bernt & Keefe, 1995). Engaging in negative friendships was a strong predictor of dropout activity (Bernt & Keefe, 1995; Okey & Cusick, 1995). Positive friendships, however, acted as an insulator against dropout pressures (Bernt & Keefe, 1995; Eccles &

Barber, 1995). A clear understanding of friendship structures was recommended as very important in a classroom dynamic.

Synthesis: Section 4- Alternative Possibilities

The previous section discussed the theoretical grounding useful in understanding this study. The following section suggests concepts that may be useful in generating opportunity factors with High-risk individuals

First, tracking and ability grouping practices remained common throughout the U.S. Up to 85% of American schools used some form of this practice (George, 1993). Several methods of tracking and ability grouping proved common. The most criticized of these were academic tracks that may limit potential growth of under skilled, individuals of color (Braddock & Dawkins, 1993; Oakes et al., 1997). Such tracking practices tended to be rigid, and arguably, biased. Much more flexible models, however, existed and proved of use to educators (Biafora & Ansalone, 2008). Such tracking often took the form of student choice.

Career and Technical programs (CTE) enjoyed a long history of attracting students who eschewed more academically challenging courses (Elliot et al., 2005). This led to the misconception that CTE courses lacked rigor or attracted sub-capable students (Elliot et al., 2005). In reality, once controlled for disabled and High-risk individuals, CTE programs performed on par with traditional, core curricula. Schools with well developed CTE programs often retained a blue-collar perception. The work of Rumberger and Palardy, however, demonstrated that it was school level concentrations of SES that worked as the strongest indicator of success (2000). Schools with high levels of

165

SES raised student achievement. Several other examples of high achieving organizations and programs existed and are discussed below.

Second, extra and co-curricular activities demonstrated a strong, positive influence on participants (Eccles & Barber, 1995). Regardless of the activity, structured school activities generated opportunity factors. Such activities proved a fertile ground for the development of positive peer and adult relationships. Eccles and Barber detected that up to 80% of dropout disengagement could be prevented by the participation in such activities (1995).

While school activities proved effective in insulating against dropout influences, the Asian family influence became utterly dynamic (Chen & Stevenson, 1995). Asian students and Asian-American students (to a lesser degree) outperformed every other ethnic group on domestic and international assessments (Chen & Stevenson, 1995). Individuals from such families generated higher grades, higher test scores and over-representation in America's best universities. Chen and Stevenson determined that much of the success of these families was due to the highly developed value placed on work ethic, competition and education in general.

For those less fortunate, community IT centers proved a useful tool for the development of the poor. Such poor included fractured families, under and unemployed, English as a Second Language (ELS) learners and recent immigrants. Community centers that featured IT programs, Clark determined, had a tremendous positive influence on High-risk groups (2005). Support with schooling, child care, employment and community involvedness were common at the Community Resource Center. The IT program was a well used and infinitely valuable tool (Clark, 2005). While Community

Resource Centers employed elements of an IT component, CTE tended to be even more involved with IT.

Third, CTE tasked itself with bringing the IT revolution into schools. Various disciplines, however, used technology for different purposes and with varied frequency (Barron, Kemker, Harmes, & Kalaydjian, 2003). There existed a disconnect between expectations placed upon teachers and actual pedagogical practices (Barron et al., 2003; Elmore, 2003). Such discrepancy was often due to resource availability or teacher training. What proved clear, however, use of technological tools continued to grow. If teachers were to be expected to use IT effectively, the impetus, therefore, must be generated by teacher preparation programs (Barron et al., 2003).

Because teacher preparation programs provided an ideal platform for implementation of new initiatives, it made sense to train teachers in use of the tools schools used (Sveum, 2010). Sveum found that incoming college freshman were grossly under skilled in the use of IT tools (17% proficient). Exiting senior students, on the other hand, proved much better prepared at (48% proficient). Sveum (2010) argued, graduating over half a program as technically illiterate existed in no way as laudable and was quite possibly negligent.

The ethnic and gender make up of CTE programs remained nebulous. So too was the composition of Head Start participants in CTE programs. Caputo detected that higher SES families tended to not use Head Start services (2003). This finding reflected the literature and was expected. Interestingly, however, SES status had no preference for School To Work (STW) participation. Ethnicity for female STW participants was not significantly different; but, it was different for males. White males who were of College

Prep track participated significantly less than the other groups. That is, blacks and white females of all tracks contributed up to 70% more than other participants groups. All other gender and track comparisons failed to achieve statistically significant status.

CTE and STW programs constituted traditional programs that serviced a wide variety of clientele. Certification programs augmented and often replaced many of the components of more traditional programs. Information Technology (IT) certification partnered with business, industry and education since the early 1990s. Much about the IT certification remained misunderstood by academia, labor and industry (Shore, 2008). There existed three characteristics of certification that lent strength to IT certification popularity: (a) Validity, (b) Consistency, and (c) Fairness (Shore, 2008). Certification popularity worldwide continues to grow exponentially (Adelman, 2000; CompTIA, 2009; Shore, 2008).

Finally, certification became the industry standard in detecting proficiency in IT use. The rapid expansion of technology use left many schools playing catch up with industry. Private training companies, testing centers, technical colleges, distance learning and self study programs all competed to capture the imagination and effort of prospective IT workers (Adelman, 2000). The IT certification industry held greater ability to stay more current, relevant and solvent than more traditional models of higher education (Adelman, 2000). If traditional institutions of higher education desired to stay on the cutting edge of IT development, then close collaboration with the power players of the IT world proved not only desirable, but indispensible (Adelman, 2000). Such thinking represented a shift away from educational and collaborative traditions used by most universities.

The motivations to obtain IT certifications topped out with economic and personal growth (CompTIA, 2009). Desire of job flexibility, advancement and stability also contributed as factors (CompTIA, 2009). In the Information Technology market, Network Administrators remained in high demand. All manner of companies required qualified network professionals to manage their data and resources (Cegielski, Rebman, & Reithel, 2003). Preference and advantage was often given to personnel holding industry certifications. Given the shortage of network professionals, an alternative measure of skill hinted as more advisable (Cegielski, Rebman, & Reithel). Such conditions encouraged many companies to develop their own benchmark assessments. Regardless of this measure, industry standards required IT professionals that passed tests that reflected current competencies, prior to and during employment. This fact, as pointed out by Adelman (2000) proved competency as there was just no way to fake it; either skill existed or it did not.

CHAPTER III

METHODS

This chapter contains the methods choices relevant to this study including discussion of study purpose, research questions, study design, methods, participants, data collection, data analysis and validity.

Research Purpose

The purpose of this study was to evaluate the efficacy of a Career and Technical Education Information Technology certification program, particularly with High-risk high school students. Career and Technical education had a long history of helping High-risk individuals transition into successful lives (Caputo, 2003; Elliot et al., 2005). With the arrival of the computer age, industry now required a new and more advanced set of skills (Shore, 2008). The triple threat of lost domestic manufacturing due to automation, outsourcing and general worker apathy exacerbated an already depressed job market. Traditional Career and Technical education has, in the past few years, shifted focus toward industry recognized Information Technology certification courses. There existed no depressed job market for those individuals who possess cutting-edge technical skills (Adelman, 2000; Anderson, Barrett, & Schwager, 2005; Shore, 2008). While High-risk individuals had often eschewed rigorous coursework, the realization of Information Technology certification as a pathway to a more positive life may be reaching such individuals. The purpose of this dissertation was to ascertain if High-risk individuals are being positively influenced by such courses and if so, to what extent.

170

High-Risk Determination

High-risk status for this study was determined by Free and Reduced lunch status, minority status, attendance record, mother's level of education, frequency of residential moves and parental support status (family unity).   While English as a second language (ESL) status was often cited by various researchers as a common factor in poor academic achievement or dropout activity (Land & Legters, 2002), the ESL construct did not fit well with the context of this study because of sampling difficulty and research focus. Various researchers, however, identified some well-fit and relevant characteristics as determinants for High-risk or dropout status (Cairns, Cairnes, & Neckerman, 1989; Dunst, 1993; Garbarino, 1995; Land & Legters, 2002; Moynihan, 1965; Okey & Cusick, 1995; Orthner et al., 2002; Vitaro et al., 2001). High-risk individuals struggled the most and gained the least despite being the recipients of various programs designed to assist them in developing positive life trajectories (Heckman & LaFontaine, 2010). High-risk individuals often distrusted institutions (Moynihan, 1965). Also, High-risk individuals required immediate gratification and concrete results if their interest and effort required sustained focus (Payne, 2001). International Information Technology certifications attainment may be able to provide adequate incentive.

Research Questions

1.   Are Information Technology (IT) certification programs more efficacious than (IT) programs that do not offer industry certifications?

2.   Are High-risk individuals more likely to achieve success in programs offering industry certification as compared to more traditional academic coursework?

3.   Are Information Technology (IT) certified individuals more likely to experience post-secondary success than non-certified individuals?

Logic Model

The table below provides a simple graphic outlining the logic and decisions that ground this dissertation.

Table 1

Logic Model Representing Broad Strokes of Study Activity

Purpose	Questions	Constructs	Data	From Who	When
The purpose of this dissertation is to evaluate the efficacy of an IT certification program	1- IT certification course efficaciousness? 2- High-risk individuals likelihood of achievement of success? 3. Certified individuals likelihood of post-secondary success?	Adaptive Literacy IT Certification Program High-risk Stakeholders	Document Analysis Observation Interview Focus Group Survey Use of Test Scores	9th Grade Students Regular 9th Grade Students High-risk Former students Parents Teachers Administrators Industry Professionals	Pretest & Posttest Continuously and Cyclically

Study Design

Several designs may have been appropriate to frame this dissertation, the case study design, however proved the best fit because this study examined, "a process consisting of a series of steps (e.g., a college curriculum process [or a high school IT certification program]) that form a sequence of events" (Creswell, 2005, p. 439). This dissertation endeavored to study a bounded system. The IT certification curriculum was bound by activity, processes, time and individuals. Elements of pretest-posttest-control, quasi-experimental methods (Campbell & Stanley, 1963) and program evaluation (Stufflebeam, 1971) contributed to this study. Use of multiple methods was viewed as acceptable and often desirable within the boundaries of case study evaluation design (Creswell, 2005, pp. 439-440; Miles & Huberman, 1994, p. 26). This dissertation was a qualitative study with a quantitative component employing a *dominant-less dominant* multiple methods design (Tashakorri & Teddle, 1998, p. 44). This dissertation was a case study conducted from an interpretive perspective. In the paragraphs below, an explanation of methods choices follows.

A feature of the IT certification course was constant and rigorous assessment that generates a wealth of test results. One common approach to IT certification pedagogy included pre-test, instruction, post-test. It therefore followed that the pretest-posttest-control design offered an appropriate method to detect phenomenon. This component served to strengthen this study rather than dilute it. The evaluation framework was provided by the Context, Input, Process, Product (CIPP) model (Stufflebeam, 1971).

The CIPP evaluation model acted as particularly robust in instances where the situational context proved relevant (Stufflebeam, 1971). Other program evaluation

models are equally useful in studying inputs, throughputs, processes, procedures,

products and outcomes. The CIPP model, however, stood apart where context was

critical in understanding studied phenomenon. The CIPP framework was discussed in the

study introduction as a useful framework for guiding research. Each component --

Context, Input, Process and Product—was its own form of evaluation. I included a

balanced evaluation CIPP model in my work.

Case Study Conceptual Model

Bounded system

Activity

Test Results

Phenomenon

Individuals

Evaluation
Framework

Qualitative
Methods

Events

Process

Figure 4. Represents rationale in the Case Study Design choice. Multiple frameworks, data collection, and data analysis techniques combined to explore the research questions dedicated to this study. This research was bound by elements inherent to the studied phenomenon and provided multiple opportunities for enhanced believability via triangulation.

The features of *Delineating*, *Obtaining* and *Providing* defined the vertical framework of the CIPP model (Stufflebeam, 1971). Taken together, however, CIPP provided a useful tool in informing planning, structuring, implementing and recycling type decisions. It was these elements, research questions and hypothesis that bound and guided this dissertation.

Participants

This section offers a discussion about population, sample, sampling methods and to whom this author generalized. Pseudonyms are used for all participants.

Sample. Four cohorts made up the sample. The studied groups represented a stratified convenience sample (Creswell, 2005, pp. 148-149). Tashakkori and Teddlie (1998) described such samples as stratified, non-random or purposive samples (1998, p. 76). First, a cohort of High-risk individuals comprised one group ($n = 18$). This researcher was assured by local administration that such grouping was possible and will be supported. Risk status was determined by assessment of risk factors possessed by each student. Scores and ranking from a local technology aptitude pretest contributed to selection criteria.

The second cohort was comprised of approximately the top half of the incoming freshman class ($n = 171$). Selection for this cohort was based on the local technology aptitude pretest. Previously, only one fifth to one fourth of the freshman class demonstrated interest in advanced IT curriculum. For this study, all incoming freshmen were pretested and the top half comprised enrollment in the advanced certification training course. This activity increased initial course enrollment by about 100 students.

175

The third cohort was comprised of the bottom half of performers from the local technology aptitude pretest ($n = 188$). These students received a less rigorous curriculum more suited to their demonstrated aptitude and ability.

The fourth cohort was comprised of students who received IT training three years before ($n = 402$). This cohort will provided enriching data as well as an additional control. Teachers, administrators and parents provided their perceptions about student experience, growth and cross-curricular effectiveness.

This dissertation was designed to examine the efficacy of IT certification programs, particularly with High-risk individuals. The sample groups studied were drawn from a Midwestern metropolitan, suburban, large school ($N = 2,150$) that supported approximately 25% free and reduced price lunch populations. The school district mandated a desegregation-style bussing program that accounted for a large percentage of the school population.

Grouping. Prospective students were pretested for computer aptitude. Prior to the pretest, a short, simple survey gathered data not available in their student personnel files. Due to the rigorous academic nature of the coursework, students without computer access at home attained disqualified status for advanced IT certification enrollment. Such students were enrolled into a less rigorous IT curriculum. Computer access proved a necessity due to the requisite homework load of the advanced curriculum.

Cohorts. Two grouping methods were used to study the educational efficacy of IT certification coursework, particularly with High-risk individuals. First, a High-risk cohort comprised the same class grouping ($n = 18$). At this high school, such grouping was not previously done with academically rigorous

176

Conceptual Framework & Interpretation Model

Delineating

Description

Unitization ← → Categorization

Qualitative Data

Quantitative Data

Implications

Data Dependant

Interpretation

Recommend-ation

Figure 5. On top is a conceptual framework visualizing initial data collection. The middle graphic represents the reciprocal approach taken with this study. The bottom graphic visualizes the relationship with interpretation and study usefulness. The above framework represented this author's approach to this dissertation.

coursework. Second, High-risk individuals will be blended into classes that also contain At-risk and low-risk individuals ($n = 171$). This researcher held that low-risk individuals comprised the bulk of the advanced IT program student enrollment for the past five years. Confirmed and blended enrollment offered insight into program efficacy as well as provided a control. Such groupings afforded a foundation for several comparisons relevant to the research purpose and questions. The following section describes the methods choices that will be used in this dissertation.

Methods

The section below detailed many of the methods that will be used in this study.

Data Collection and Instrumentation

Information technology certification courses provided many opportunities to generate quantitative data. This study used seven IT certification exams to generate five industry level certifications. They included: Microsoft Word 2007, Microsoft Excel 2007, Microsoft PowerPoint 2007, Microsoft Outlook 2007, Certiport- IC3 Computing Fundamentals, Certiport- IC3 Key Applications and Certiport- IC3 Living Online. Passing all three IC3 exams resulted in a Certiport IC3 certification. All three Certiport exams must be passed for certification whereas the Microsoft exams existed independently. Each test instance generated a passing or failing numeric score based upon a 1000-point metric. Passing scores varied by exam type. Further instances of data collection included Grade Point Average (GPA), ACT scores, scholarships attained and pretest /post-test scores.

Data collection primarily employed qualitative methods. Observation of students generated detailed notes to inform this dissertation. From observation records, focused

activities probed the student learning experience. Data generated from the focused assignments informed interview protocols. Data collection provided "thick" description to inform a complete analysis (Geertz, 1973; Lincoln & Guba, 1985). Quantitative elements of test scores, certifications attained, GPA, SAT scores and scholarship records will complement the qualitative data collection effort. All data collection stopped prior to June 15, 2012.

Interpretive data collection particulars were bound by the nature of the study. Semi-structured interviews of 10 to 15 questions were all conducted at FCHS. About half of all individual interviews took place in an empty classroom. The rest of the student interviews were conducted in a library resource room which also allowed for privacy. A total of 40 student interviews contributed to this study: ($c1 = 18$) and ($c4 = 12$). Individual interviews lasted about 20 minutes. All student interviews were digitally recorded and later transcribed.

Five focus group members engaged in discussion in an empty classroom also at FCHS. The focus group conversation also lasted about 40 minutes and was semi-structured. The focus group was sandwiched between 2 rounds of 6 student interviews. Early interview results informed later focus group and interview activity.

Adult teachers, administrators, and support personnel who contributed to the study were interviewed in various rooms and offices at FCHS. Industry professionals were interviews by telephone, email and in meetings. Over 30 education and industry professionals helped to inform this study.

Analysis

The following paragraphs detail analytical techniques used in this study. A combination of qualitative and quantitative methods informed this work. While multiple methods were used to analyze these data, it is most useful to view this work as a qualitative study with quantitative components.

Qualitative. Constant comparative analysis was used to search for patterns throughout this study (Miles & Huberman, 1994; Tashakkori & Teddlie, 1998)

Table 2

Study Theoretical Timeline

Pretest Ave	Section 1 exam Posttest	Section 2 Prep Pretest	Ongoing Unit avg Instruction	Section 2 exam Posttest	Section 3 Prep Pretest	Ongoing Unit avg Instruction	Section 3 exam Posttest	End of year shutdown
Aug	Dec 1-15	Jan 7th	Jan-March	April 1-15	April 16	April 17-May 14th	May 15-23	Data and Reflection
Pre-test data Col-lected	Post-test Unit Data	Pretest Unit data collected	Pre and post data for each chapter assessment	Post-test Unit Data	Pre-test data Collected	Pre and post data for each chapter assessment	Post-test Unit Data	Tabulation Of # of Certification & percents
	Observation Focus Group Interview	Observation Focus Group Interview	Observation Focus Group Interview	Observation Focus Group Interview	Observation Focus Group Interview	Observation Focus Group Interview	Observation Focus Group Interview	Observation Focus Group Interview
Proximal	Proximal-Distal	Proximal	Proximal	Proximal-Distal	Proximal	Proximal	Proximal-Distal	Distal

Note. Date above represented theoretical timeline only, actual timeline may differ.

Use of constant comparative analysis also informed study stages (Wolcott, 1994). This activity took two forms. First, data and trending from observations and informal interviews were coded and then organized. These data then informed initial analysis. The resulting data revealed patterns that generated an interview protocol. By use of

180

constant comparative analysis, trends emerged that provided a valid representation of phenomenon (Miles & Huberman, 1984). Second, Wolcott advocated: (a) description, (b) analysis, and (c) interpretation (1994, p. 12). This dissertation also included Lincoln & Guba's "analytical scheme" that refined data into *unitizing* and *categorizing* (Tashakkori & Teddlie, 1998, p. 123). These techniques helped provide the epistemological lens required to make sense of phenomena.

Quantitative. Descriptive statistics will generate various themes. Such trends will produce dialogue, tables and charts. The nature of IT certification testing lends itself toward quantification. Numerical test scores were generated throughout the year, not just at the end. Also, GPA, ACT scores and scholarships metrics proved insightful. In addition to descriptive statistics, Analysis of Variance tests proved useful in examining variance between groups. Reliability coefficient significance was set at ($p < .05$) alpha. This analysis used Statistical Package for the Social Sciences (SPSS). Small sample comparisons and numerical variance in sample populations proved problematic. It is best, therefore to view statistical evidence as complimentary to interpretive results.

Interpretation. Wolcott (1994, pp. 40-46) recommended 11 separate possibilities or strategies one could use to interpret findings. This author held that until data were collected and analyzed, it was premature to choose one method. Study design allowed for the findings to match themselves with one of Wolcott's interpretation models.

Credibility

The validity measures often found in quantitative research are not very applicable in qualitative studies. While much of the rigor was similar, the approach and vocabulary

proved quite different. Some qualitative researchers held that through "thick" description, validity, reliability, rigor and persuasiveness became transparent (Geertz, 1973; Wolcott, 1994). The discussion below details some of the steps this author took to insure rigor, credibility and persuasiveness.

Institutional Review Board. Several preliminary steps smoothed the way to Institutional Review Board (IRB) approval. First, IT program evaluation was a component of the school Consolidated School Improvement Plan (CSIP) filed with the district. Second, program evaluation was part of the normal educational process, reflected in course syllabi. A refusal clause was also written into the syllabi that served such courses. During the 2010-2011 academic year, no parent or student exercised their right to option-out of program evaluation participation. Third, appropriate faculty had been performing annual program reviews for years. Such reviews existed as continual and contributed to program efficacy. Preliminary district-level research approval for this study was granted; full approval by the research institution's IRB was granted in February, 2012. All data collection ceased prior to June 15, 2012.

Trustworthiness of the Data

Over the course of one academic year, appropriate personnel gathered data informing this study. Researchers often criticized intensive data collection points for bias (Rossman & Rallis, 2003). This researcher chronicled each step of data collection process and used it to inform the next stage of data collection or analysis. This researcher was never in a position of direct supervision over primary participants; this precautionary measure greatly reduced the possibility of data contamination. Data triangulation via constant comparative analysis and statistical methods enhanced study believability.

Circular or complementary methods were viewed to provide necessary transparency and rigor (Miles & Huberman, 1994; Rossman & Rallis, 2003; Wolcott, 1994). While several authors recommended a level of reflexivity (Creswell, 2005, p. 274; Rossman & Rallis, 2003, pp. 35-36), this author achieved a level of reflexivity via reciprocity with participants and interpretation (Rossman & Rallis, 2003, pp. 159-162). This dissertation used a conceptual design and research methods that complemented a case study model.

Purposive Sampling and Generalizability

The practice of purposive sampling, while not the "gold standard" of random sampling, is still common in studies where people, context, treatment, or outcomes may represent diversity. Homogeneous samples with controls represent a lofty goal for researchers, but are often unobtainable. Heterogeneous samples make up for loss of experimental rigor by being real world (Shadish, Cook, & Campbell, 2002, p. 92). Various authors also described purposive samples as "information rich" (Creswell, 2002). This dissertation proposed study of several groups. A cohort of High-risk individuals ($n = 18$) comprised one group (c1). A second group of blended-risk IT certification students ($n = 171$) were also be studied (c2). Cohorts of blended-risk, non-certification IT curriculum students ($n = 188$) further contributed to this work (c3). Finally, previous IT students ($n = 402$) populated the last cohort (c4). These separate groups provided adequate control and treatment groups to inform this dissertation.

CHAPTER IV

RESULTS

The previous chapter contained a discussion of the various methods used in this study. This chapter discusses the result obtained. Data notations help understand these data. The first letter indicated type of data collection, "i" for interview. The second letter indicates from what group the data were obtained. The third symbol set represents the participant's pseudonym. Table 3. is useful in decoding data origins.

Overview of Data Display

The data contained in Chapter Four were arranged within the framework of a CIPP evaluation model. Three groups contributed to each stage of the CIPP evaluation process: organization, students and industry. A summary concluded each CIPP evaluation section. Data answering this study's 3 research questions contributed to each section of Chapter 4.

Context, Inputs, Process and Product Evaluation

The following sections contain a CIPP evaluation of the IT certification program under study. Research questions are answered within the CIPP evaluation framework. Table 3. below, provided clarity for understanding the participants important to this study.

Table 3.

Table of Significant Participants and Cohorts

BRUSD
Big River Unified School District
FCHS
Falls City High School

Andrew	Veteran Teacher-Math	Parker	Veteran Teacher-Tech
Bengal	Veteran Teacher-Tech	Joe Bob	Veteran Teacher-Tech
Xerxes	Veteran Teacher-Tech	Janet	Director of Technology
Kent	Veteran Teacher-Tech	Chris	Regional Sales Rep
Ellen	Emerging Teacher-Tech	Davina	Veteran Counselor
Mabel	Veteran Teacher-Tech	Karen	Veteran Teacher-Tech
Lorita	Principal	CIPP	Context/Input/Process/Product
Jed	District Tech Liaison	Wayne	Veteran IT/Business Teacher
Chris	IT professional	KDE	Kentucky Department of Education
ip	Industry Professional	CTE	Career & Technical Education
slt	Administrative Staff	f	Faculty
c1	Cohort 1	c3	Cohort 3
c2	Cohort 2	c4	Cohort 4

Note. This table includes significant participants relative to this dissertation.

Context

The following section provided a discussion of Context from the Organization, Student and Industry perspectives.

Organization Context

The context section contains discussions including Staff, History of Performance and Programs, Market Share and Challenges. This section begins with discussion of Geography and Population.

Geography and Population

Falls City High School (FCHS) was located in an affluent suburb of a large Midwestern city. The school was built in 1950 and had undergone several renovations to

date. Major renovation was scheduled to begin starting Spring, 2012 and scheduled to last for two years. Falls City High School was a sprawling building containing one of the largest student bodies in the state.

Students. Approximately 2100 student attended FCHS with the largest class traditionally being 9th graders. "Crowded" best described the occupancy status of FCHS. The campus was designed to occupy 1700 students. While no additional rooms have been added, many utility, storage and meeting rooms have been converted into classrooms and computer labs. Quality programs in the arts, rigorous Advanced Program (AP) offerings, winning sports programs and a nationally acclaimed IT curriculum all help to keep FCHS full. Overcrowding was exacerbated by two additional factors: district mandated desegregation-type bussing practices and the rising cost of private education. In short, people wanted what Falls City High School delivered.

There are many ways one could classify the population of FCHS. For this study, however, three major groups were identified. First, local students from Middletown, KY comprised the largest group. Many households, particularly in years of a weak economy, eschewed the high cost of either private education or the transportation cost associated with enrollment in one of the district's several, excellent academic magnets. Also, refusal was common for many applicants to academic magnets simply because of enrollment capacity.

A second group of students attended Falls City High School for its Business and Information Technology (BIT) program. Also, attendance was contributed to by those who enroll in award-winning programs like, Band, Orchestra, Visual Arts, Law and Justice, academic teams and sports. Depending on an individual's situation,

transportation may or may not have been provided. These students often proved excellent academics and enhanced FCHS in public perception.

The final group of students enrolled at FCHS lived in the West-end of the city. The West-end students were often subject to a wide array of disadvantages. Long bus rides, poverty, family instability and lack of parental support often hindered student success. An exacerbating reality of West-end students was access. Parents often struggled with the ability to come to school for activities, conferences, team competitions and performances. As a result, many students from the West-end did not participate in school activities. Unfortunately, the typical West-end student did not profit from the many opportunity factors or benefits inherent in participation with school activities (Eccles & Barber, 1995). Most of the West-end population at FCHS struggled with academic success and often failed to gain necessary credits to graduate. The results of this fact manifested in increased discipline problems, subsequent suspensions, poor attendance, further failing grades and high frequency of school transfers or dropout.

Staff. Falls City High School had a faculty of 110 individuals and a support staff of 40. Falls City High School used a departmental model that organizes groups of teachers by subject matter. The Falls City High School Business and Technology (BIT) department consists of 14 teachers and was the largest (BIT) department in any Kentucky high school. The BIT department experienced turnover just about every year and for a wide variety of reasons. Quality Business and Technical teachers can be difficult to acquire in the best of times. District transfer policies often complicated the labor acquisition question greatly. The BIT department qualifications ranged from cutting edge to traditional. Also, large variance existed in years of teaching experience, industry

experience and educational attainment. The spread ranged from a B.A. with a teaching certificate in progress, to a Ph.D. in curriculum and instruction. Getting the right mix of educational attainment and industry experience remained a challenge. While this problem existed in other departments, it remained acutely persistent in the BIT department.

Technology Program

The FCHS Technology program consistently outperformed schools at the local, state, regional and often national level. Graphics design, Web Design, A+, Net+, Security+, Microsoft Office Specialist and IC3 certifications abounded annually. The certification attainment at FCHS was consistently among the top performing schools internationally (www.certiport.com). Falls City High School students regularly participated in and remained competitive at the national and occasionally international stage.

One of the elements of the FCHS Technology curriculum that made it unique was the range and scope of course offering. Parker, a well respected, veteran teacher described:

> There are a lot of technology programs out there. Almost every high school has one. What makes Falls City High School special is the incredible variety of technical programs and the fact that those programs are sequenced. Programming, Graphic Arts, Video Design, Web Design, Hardware, Software, Security, Microsoft Office and IC3 are all available and often available for several years in a sequence. (i,f,p)

While some schools had some of these programs, Falls City High School Technology seemed to have found the right mix. Evidence for this position was found by full enrollment and excellent placement history for program graduates via internships, scholarships, post-secondary affiliation and job placement (i,f,jb).

Market Share

In 1976, the parochial schools in Big River County struggled. Public schools were almost completely racially segregated. At that time, Big River County School Board instituted a desegregation-style student assignment plan. The plan was met with open hostility from many parts of the local community. One externality of the desegregation plan was that enrollment in private/parochial schools skyrocketed. Despite a wide variety of research that suggested harmony, a great deal of anger and animosity existed with local residents. Hard feelings remained pointed directly at Big River Unified School District. Parents, then as now, continued to vote with their feet.

The families of BRUSD, regardless of background and income, often enrolled their child in a school that focused on some theme. Examples of such themes included health sciences, performing arts, engineering, college prep and business and information technology (BIT). Such schools formed the basis of the BRUSD magnet program. The BRUSD Magnet program was ideal camouflage for social programming and continuing desegregation-type practices. One major drawback, however, was the high cost of student transportation.

The high cost associated with magnet programs and desegregation-styled student assignment plans drew criticism for decades, according to Andrew, a veteran teacher and businessman:

> You know, yesterday I had my kids ask me why we have such old textbooks and ratty furniture and desks and I told them that all of the money that would be spent on those types of things are instead spent on bussing. Can you believe that BRUSD is proud, actually brags about maintaining the third most expensive student bussing program in the County? It really is a form of insanity. (i,f,a)

This criticism was exacerbated by the low standing of consistently underperforming schools. As a result, communities around Big River County grew in size and quality of education. Again, local residents voted with their feet and moved to surrounding counties in droves. It was often communicated to affluent workers who moved to area to keep their children out of BRUSD schools (i,f,a).

The pattern evolved that many families' parents worked in Big River County but lived and went to school somewhere else. The BRUSD came to understand the competitive nature of local schools in attracting students from affluent families. Also, districts and schools competed fiercely to attract and retain the best staff. Market share in Big River County and surrounding counties continued to affect the quality of and access to an adequate education. Many high schools adapted to this reality by building superior quality programs. It became common for these programs to earn regional and national acclaim. Falls City High School built several such programs; foremost among these was the Technology Certification Program.

Organization Context Challenges

Several challenges arose as inherent to the context of BRUSD, Falls City High School and its Technology Certification Program. First, Falls City High School often scrounged for resources. There existed a perception that because FCHS resided in an affluent area, it always had enough resources. Such thinking allowed much needed resources to be diverted to underperforming schools or those which drew from a more impoverished population. The problem was that to keep programs, particularly an IT program, "cutting edge," then massive outlays were required for regular lab upgrades, software, networking requirements, training materials, professional development, travel

and other such activities. Such funds often came from either inside the school via fees and fundraising activities or outside the district via federal Perkins-style funding.

Second, programs at FCHS all seemed to vie for the same 500 out of 2,100 students. Students participated in over 70 clubs, sports and activities sponsored at FCHS. Quite a few of these programs ran year round. As a result, students often stretched themselves thin between clubs, sports and academic demands and eventually became frustrated. Complicating the conversation on one hand, the participation problem was frequently exacerbated by older students who often need to work to support a car. On the other hand, students who bussed across town often proved ineligible or unable to participate in the very programs and activities that attracted them. Bussing required them to leave virtually minutes after school dismissed. Full student participation in school activities proved an elusive goal for the leadership of FCHS.

Student Context

The previous section discussed context as it relates to this study. The following section works to answer the research questions from a contextual lens.

Motivation. There existed a great many influences that motivate the students in the IT Certification Program.

Parent motivated students who enrolled in FCHS's IT certification maintained motivated to do well in order to please their parents. One student, Abbot, described getting his motivation, "Sometimes from my parents, sometimes from myself" (i,c1,a). Another student, Caesar, was motivated from, "looking back at my parents or grandparents, they were not as successful as they should have been. That's what motivates me" (i,c1,c). Eduardo also took a cue from his parents, "My parents always

told me to get good grades so it would help me with a job later in life" (i,c1,e). Gustavo reinforced the influence of parents on student motivation by saying was, "Parents are my main motivation" (i,c1,g). Another student, Paul, described his motivation as an effort to please his Mom:

It has to be my Mom. My Mom wants me to go out into the world and really do well and being an athlete doesn't always work. So, I can go get a career in technology so my Mom wants me to go forward because she knows that the career thing this I want probably won't work. So I have this as a backup. (i,c1,p)

Kenneth furthered a family motivational position by saying:

I think in the beginning, it was mostly my family, but then about halfway through the first semester I started to realize it was all about me and I needed to start taking care of myself and worry about my own grades and not to please other people. (i,c1,k)

While Kenneth began to show signs of academic maturity by taking responsibility for his grades, Frank took it a step farther and saw it as a challenge to his parents and himself, "It's really just to prove myself and prove to my parents I can do the work and succeed if I want to" (i,c1,f). Parents comprised an important component to success for many students enrolled in the IT certification program. Other influences, however, proved equally motivating for other IT students.

Self motivated students from the High-risk cohort proved self driven and eager to respond to challenges. Briana was motivated to, "Feel good about myself. I feel that if I try hard, then better things will come along and If I don't try hard then things are not going to turn out like I want them to" (i,c1,b). Another student, Caesar, was motivated by, "The feeling of being successful" (i,c1,c).

While some of the students expressed interest in pleasing their parents or responding to the lure of self improvement, the majority of the IT Technology

192

Certification students drew motivation to success from a desire to be prepared for college and the workplace.

Career motivated students drew a direct correlation between skills taught in their IT Certification class and enhanced college and career prospects. Isaac was learning as to prepare for college, "My motivation is to learn what I need for college...I want to be a computer engineer and I want to learn a lot" (i,c1,i). Roberta says about motivation, "I just want to get to a good college" (i,c1,r). Certification was directly tied to money and opportunity by Briana, "Like, I get certified. I will go to a better college and get more money and it will help me to get more scholarships and a higher paying job in the future" (i,c1,b). Hank described his feelings of motivation, "With these certifications, I will work hard and look good when I go to get a job or go to college" (i,c1,h). Kenneth was able to articulate his motivation to succeed:

> The certifications I get now are going to [be] there when I apply for jobs and colleges. College, you are by yourself and I believe this show how I can do things on my own. Most places, from what I have heard need people. All around the world, the world needs different things [skills]. I believe coming from this school helps. (i,c1,k)

While the desire to prepare for college was well steeped in cohort 1, so too was the desire to attain jobs. Students demonstrated a clear understanding of the relationship between skill attainment and gainful employment. Neil articulated his understanding, "I feel that [certifications] are very important. If I didn't have those, it would be very difficult to get a job" (i,c1,n). Another student, Frank talked about his feeling about career motivation and IT certification:

> I don't really think there are that many jobs that don't require computer applications these days. I expect to use Word and Excel in the future with my job. Anywhere I go whether if I choose to go to an office job or something else. (i,c1,f)

193

Another student, Caesar, said, "I'd use it for like as a desk job, just in case the lawyer thing does not work out" (i,c1,c). The final type of motivation to be discussed was a motivation for literacy.

Motivation for increased literacy revealed itself within several of the students. Such individuals understood a link existed between attaining advanced computer skill and possessing increased literacy. Abbot said, "I am going to have an IC3 diploma and I'm going to know how to work on the computer, how to create good project in Excel and Word. It will help me all around" (i,c1,a). Another student, Paul, described his motivation for increased literacy:

> I had a project not too long ago where we had to make a PowerPoint for the books we read. I was able to use the skills I learned toward the project. Basically, what I plan to take away from it [IT certification class] is basic computer skill and how to apply it outside of computer class. (i,c1,p)

The desire to put forth extra effort came from various forms of motivation that was indicative to the students of FCHS generally and to the High-risk cohort of the IT certification class specifically.

Industry Context

The industry context was discussed within the literature review. Source data, however, from industry leaders fleshed out this topic.

Need for Validation. Employers from various industries had a history of always looking for highly skilled technology workers. As American industry transitioned from manufacturing to service, the search for qualified IT workers became more intense. What, however, defined a highly skilled IT worker as "qualified?" Jed, a highly placed district technology consultant summed it up:

There are three areas that are important for a successful person and that is education in some sort of degree…You also got industry certifications, which show that you are relevant and current in your knowledge. And, also experience. When I was [hiring] in the IT field, I was always trying to figure out how to get those three things because when you have got those things, it is not very hard to be employed. (i,ip,j)

In the following section, discussion of three elements that directly relate to industry level context, particularly as it pertains to an IT certification program occur. Three primary characteristics combined to create the ideal IT worker "trifecta."

First, education in the traditional sense was no longer viewed as a ticket to success. Broad based IT or computer science degrees from traditional two and four-year institutions often proved generic in nature. Industry, however, grew ever more proprietary in the past two decades. Jed summed up his experience:

When I started in networking 10 or 15 years ago, in the IT field, a lot of technology was just being put into place. There were not a lot of [education] programs out there that could support those systems. Schools with computer science would put you out where you might know how to program, but you would not know how to set up servers and computers and networks. (i,ip,j)

Proprietary certification programs undermined traditional paths to an IT career. Many IT professionals circumvented the traditional classroom setting. Instead, they put their effort into non-traditional certification training that culminated in certification attainment.

Second, certification further filled the need for validation by an industry maledicted with a need for exactitude. Industry professionals from the largest IT certification company in the world provided much insight about the value of certification attainment. One Certiport employee, LW, described certification attainment:

The certification is proof that the individual possesses the skills. Anytime that you can provide proof of you skills, then you immediately become more marketable compared to someone that cannot. (i,ip,lw)

This position was predictable from an individual that sells IT training and certification.

Interestingly, however, similar positions echoed from every executive interviewed.

Another Certiport executive elucidated his position on certification attainment:

> The value of certification is important in the competitive workforce because it separates the certified individuals from the rest of the crowd. I see it becoming more relevant as we move forward. A college degree, in most cases, is not enough. Industry recognized certifications with degrees and experience will become the standard for employers. (i,ip,wp)

The manifestation of these types of perceptions was eventual in that more and more

secondary schools began to offer IT certification training. Another Certiport executive,

BP, put it succinctly:

> I personally see that the most influential and recognized certification pieces will not only start to be more common for juniors and seniors in high school...I see it starting to be utilized more and more on younger/lower grades. (i,ip,bp)

This way of thinking was exactly what FCHS envisioned five years ago when it

began pushing certification attainment to 13 to 15 years old, freshman students. Such

training often led to additional work experience via technical work-study programs, job

offers and internships. The final piece of industry context, as it related to IT certification

programs was experience.

Third, experience proved the final jewel in the triple crown of employment.

Experience was the manifestation of education and certification. Stakeholders firmly

held that educated, certified individuals would not have difficulty finding employment

within the IT field. The job market, competitive and expanding, cried for capable IT

workers. Jed stated, "It is just that there were not enough [qualified] people" (i,ip,j).

Employers not only valued the certifications themselves, but admired the work and

discipline required to attain them. Another Certiport executive explained:

Individuals with certifications know the value of hard and efficient work. They earned this knowledge from the hard work they put into attaining their certifications. These skills help them work smarter and be more efficient in every aspect of their lives, not just employment. (i,ip,ks)

It was however that very recognition, especially in a hyper-competitive labor market, that

drew certified employees and industry together.

Caveat on Certification Attainment.

While certification attainment was desirable in general, how one attained their

ticket mattered significantly. Jed, a high-ranking district IT consultant warned about the,

"certification boot camp." These programs, while infusing individuals with some skill,

often led IT managers to devalue certification attainment in general. Jed described the

certification boot camp as where, "You go to a fly by night school or take a week long

session. And they cram how to take a test, just what you need to know and you get an

industry certification" (i,ip,j).

Such experience was directly opposite of where Jed also described the quality

high school program:

> Quality high school programs are going to take a kid, day in and day out, they learn hand on experience. They learn from a qualified instructor and in the end, they get one or two industry level certifications. Hopefully, a high quality CTE program will provide some sort of work based experience. So even if a kid has all three, they have a little bit of each, they have two or three years of training, they have certification, and maybe they get a job shadow so that when they leave high school, they will not be experts in the field, but they will have all three component so be able to go out and get an entry level position. (i,ip,j)

This position was also parroted by Joe Bob. He discussed the value of FCHS's job

shadow and internship record:

> We place some interns their junior year…There are two jobs open at [Big Regional Hospital] right now. They are excellent jobs. In the past, we have actually hired some of our student through [Funded Vocational Initiatives]. That was where we employed students to get more hand on experience working with us

and working with the public. Networking, teaching tech concepts...the trick is to look at just how much experience does a junior have. Realistically, it is up to the student. Also how many certifications does a student have, and age. Some of them are not very old. (i,f,jb)

Falls City High School placed students in virtually every major employing agency in the city. Local colleges and universities teemed with FCHS graduates staffing their technology departments, IT and engineering programs and schools of business. The golden triangle of education, certification and experience was ground into youngsters as valuable and worth attaining.

Context Summary

The three sections of context, Organizational Context, Student Context and Industry Context intertwined and amalgamated into a picture that showed clear purpose, high levels of motivation and often high levels of effort. Three major themes were drawn from this section of the study. First, FCHS worked very hard to ensure that young people attained certifications. A large amount of effort and resources helped ensure consistently high levels of student achievement.

Second, despite having numerous examples of individuals that did not demonstrate such feelings, many individuals showed a deep commitment for pursuing certification attainment. Interestingly, young people often showed a strong interest in their own future via either post-secondary training or job attainment. These positions opposed much of what could be expected from the poverty literature reviewed by this author.

Finally, industry made three primary demands. Prospective employees should attain education, certification and experience prior to securing an entry level position.

Also, schools worked hard to ensure that experience was being gained in the classroom and on the job.

Inputs

The previous section discussed the Context surrounding one IT certification program as it pertained to a school organization, students and industry. The next section discusses inputs from the same perspectives of organization, students and industry.

Organization Inputs

The following section discusses program inputs drawn directly from the school organization, students and industry.

Facilities. Faculty supported seventeen computer labs used by the faculty, staff and students at FCHS. This model was unique in the district. Most schools relied on computer support from the district. Many years ago, however, the FCHS technology leaders learned that it was often better to do the work in-house. As a result, computer education services were rarely seen at FCHS. District computer services, then, theoretically, devoted their time, energy and resources toward schools that demonstrated greater need and less capacity.

The IT faculty. The IT faculty at FCHS traditionally had been hired quite selectively. Part of that selection process included one's ability to turn piles of junk parts into a working lab in just a few days. Resources involved in this lab setup process included a small box of replacement parts, a few disks of software, and if one was lucky, they would get a few students on loan to help. As the program grew, emphasis was placed on areas outside technical competency including business experience, business background and willingness to run clubs or coach sports. A very strong core of

technically proficient teachers, however, continually oversaw school-wide lab maintenance. This type of maintenance always started with a teacher's own lab. All technology teachers worked hard to keep their labs functional and updated.

Staff. The FCHS faculty and staff supported the computer labs in several very important ways. Light repair and sometimes electrical wiring or maintenance was performed by physical plant staff at the request of faculty. This activity had been common for decades and had resulted in a hodgepodge collection of electrical circuits. Facilities management staff abstained from running network wiring; such wiring was usually done by faculty and students. Occasionally building-wide wiring orders were sent into the district for outsourcing. These requests proved to be insidiously avoided when possible. Facilities management, however, kept the lights on, the heat and air conditioning working, and constantly fixed the wear and tear associated with the labs that serviced around 2,100 students (i,f,jb).

Technical facilities support. Such support came from the students themselves. The FCHS helpdesk and several other advanced technology training classes like A+, Net+ and Security +, proved very helpful in maintaining labs. Such maintenance occasionally required an entire lab rewire including updating computer switches. The general wear and tear on a well maintained lab sometimes required virtually hundreds of fixes annually. Part of the FCHS education philosophy was to generate as many hands-on opportunities for the students as possible. As a result, students executed hundreds upon hundreds of service requests yearly (i,f,x).

Funding

The funding requirements for a technology program, particularly a certification program demonstrated itself extensive and often cyclical. For example yearly expenditures required for upgrades in software and testing center licenses proved expensive. Unique to the technology department, such expenditures required creative means of funding. Other funding requirements included purchase of modern technology, parts and equipment for maintenance. Classes in Shakespeare, physical education and the sciences simply did not have to deal with such funding burdens.

Program funding. Funding came from several sources. First, most technology courses and all technology certification courses required fees. This position was hotly debated at conferences and professional development sessions. On one hand, there existed proponents for free testing across the board. One district level technology director from a large Florida districts expounded, "I will never be involved in a program that charges any student one cent to obtain a certification that should be paid for by the district and state anyway" (i,ip,j). One the other hand, the FCHS technology staff piloted several initiatives involving free testing and found results disappointing. One teacher pointed out, "If the certification has no cost, then the kids and parents automatically assume that it has no value. They just don't work as hard" (i,f,x). Furthermore, Xerxes expressed "when a parent has to shell out a big fee for testing, then they tend to be much more active in supervising student work. As a result, more kids get certified. We are keeping our testing fees" (o,f,x).

Course testing fees remained a common feature at many high-end schools, particularly those that offer Advanced Program classes for college credit. These courses

often demanded that student pay for, take and pass a test for them to obtain college credit. Students on fee waiver were exempt from testing fees. Traditionally, however, several problems arose from this fact.

First, few low-SES students enrolled into technology certification courses. Second, typical low-SES students often suffered from High-risk status via limited resources or support from home. This group often comprised the bulk of individuals who failed their certifications exams. Third, the rationale behind fee waiver held that the district would pick up the tab for those individuals who hailed from low-SES households but enrolled in classes requiring fees. The problem became that if disbursement from the district came at all, it would come at a reduced rate and at the end of the year. As a result, fees were raised for students who could pay to cover for those students who could not. It became prevailing thought at FCHS that the fee structure proved itself critical to maintain cutting-edge program as well as to keep student and parent motivation high (i,f,d). All students interviewed considered the fee structure fair.

The Department for Career and Technical Education (CTE) provided the second source of financial input. Federal Perkins funding was allocated at the district level and then disbursed to the individual schools based upon many factors including need, application, frequency of request and program timeliness. Often, however, the timing and inconsistency of financial disbursements restricted any type of systemic planning. Program level, district sourced funds proved themselves an undependable, yet much appreciated gift.

Grants and categorical funds. These funds are provided for sponsored initiatives provided the third source of financial inputs. Categorical funding always came

with strings. Often times the equipment or funding was much needed and welcome. It proved often the case, however, that initiatives associated with funding or equipment did not fit well with existing populations, programs or capacities. A recent example of this fact was the Geo Information Systems (GIS) program. The FCHS technology department was given a lab full of computers provided they would integrate the GIS curriculum into their existing programs of study. After six years, the program was finally dropped due to lack of student interest. Dated parts, incompatible hardware and software and offers of irrelevant assistance completed this picture.

The school budget. Perhaps the most important source of funding and perhaps the most relevant was the school budget. Facilities, salaries, new equipment, repair funding for replacement part all came from the school budget. While secondary funding sources often paid off software and testing licensure, initial procurements almost always required school budgetary funds. Summer work, professional development, industry organization fees, travel expenses and conference fees were also often paid from the school budget. Management of financial inputs required superior planning and administrative skill. Programs that lacked such aptitude often succumbed quickly to lukewarm results at best and program failure at worst.

Equipment. While many organizations across the nation used mixed platform facilities, FCHS managed and used Personal Computer (PC) equipment only. In the arena of education, this position was abnormal. Apple/Macintosh computers seemed to dominate several fields including k-12 education. The decision to maintain a single platforms school had many advantages and was made nearly two decades prior. The decision to use PC's over MAC's was due to business and post secondary trending. One

Certiport executive held, "Over 90% of employers function off of the internet and are PC based" (i,ip,bp). In the business world, IT professionals relied heavily on hardware and software associated with PC's. That position remained steadfast at FCHS.

The IT faculty at FCHS managed over 700 PC machines of various makes and models. The dominant brand, however, was Hewlett Packard (HP). While the staff occasionally showed contempt of HP computers, district guidelines strictly regulated purchases with categorical funds. When provided with laptops, Joe Bob said, "These damn things are no better than toys. Good for my kid to draw with. It won't run the software I need. Not enough ram, not enough processor" (i,f,jb). Interestingly, district policy strongly regulated even equipment purchases made from discretionary or local funds. As a result, HP labs and individual machines replaced a variety of other brands over several years.

While unimpressed with HP quality, advantages existed by using one brand. Like the use of one platform had its advantages, so too did the use of one brand, particularly in the areas of support and maintenance. By contracting with one company, benefits developed via large volume purchasing and support agreements. When requesting various forms of support, dealing with just one company had distinct advantages. So too advantages existed with physical repair after warranties had expired.

While economy of scale often had advantages, district purchasing policy often rubbed the FCHS technology staff the wrong way. One veteran teacher, Xerxes recently held:

> I need to purchase several different brands and models to prepare my kids. When they get out in the world, they are not going to purchase or work on just one brand. I tried to explain this to the district purchasing department and they said that we had to use their vendors and purchase the recommended brands or they

would not be paid. Even with our money! Kickbacks, I have always suspected this, but I was shocked to actually hear her say it. (i,f,x)

There seemed to be constant tension between district computer services as expounded by Joe Bob:

> It is better that we don't have them out here. They have absolutely no standard of accountability. They have come out to the school, disassembled a machine, scattered the parts and then disappeared. No, it's better that we take care of ourselves. (i,f,jb)

The task of maintaining all that technology was often daunting. Complication by district level computer education services and purchasing encumbered an already difficult job. Clear lines of communication, flexible purchasing options and district level accountability topped the list of departmental equipment concerns. Maintaining local independence, however, was viewed to be a critical component to school and program success.

Effort and Expertise

To run a successful IT certification program, it took high levels of effort and expertise. This conversation will start with a discussion of teacher effort.

High levels of effort. High levels of effort defined the IT certification program. The IT certification program under review appeared to be unique in several ways. Falls City High School combined two individual curriculums IC3 and MOS into their advanced freshman computer applications course. To this researcher's knowledge, this was not being done anywhere else in the region and possibly the entire County. One Certiport executive, however, did mention a school in Louisiana that had piloted a similar effort, but had yet to achieve consistent results (i,ip,cy).

205

The decision to combine these two separate, but highly complementary curriculums was piloted three years prior. For nearly two full academic years, the freshman advanced computer applications program had enjoyed full implementation and administrative support. Motivation to combine these programs was in response to several calls for increased rigor and relevance.

Such calls were made with circular frequency at the national, state and local level. The results have been most promising. The tradeoff, however, was that students and instructors must apply high levels of continuous effort to achieve the five, internationally recognized, IT certifications. Seven certification exams comprised the required assessment for completion of the program. Bengal, a veteran teacher explained the levels of classroom effort:

> You have to grind it out every day. In order to get though the whole program with all your kids certified, you don't have time to screw around. You have got to move. You have got to keep motivation high. You have got to vary instruction and assessment methods. You simply cannot do the same thing every day. To be successful, to get your kids certified, it takes a lot of work. (i,f,b)

High levels of effort were required throughout the year. The type of effort required from the student correlated with the subject matter being taught. For example, some sections of the curriculum proved very theoretical while others required a very hands-on approach. Some sections and instructors required lots of bookwork, whereas other sections or instructors required a more project based approach. A more thorough discussion of process and pedagogical choices are contained in the process section. Regardless of different methods, success with IT certification courses required hard work and lots of it.

High levels of expertise. Success required high levels of expertise to effectively deliver this curriculum and such expertise varied by instructor. A regional sales and support representative from Certiport described best practices like this:

> I went to a presentation at a recent conference and there were two teachers there who were describing their program. They took the position of dual teaching. One teacher had strength in the more technical aspects of the hardware and operating systems. The other teacher had more strength in the applications. They seemed to think that the best model was for one teacher to have both sets of skills A+ and applications. If that person was not available, then team teaching did just as well. (i,ip,c)

These types of tests, designed to be non-intuitive, contributed to program rigor; one simply cannot "fake it". Psychometricians worked very hard to insure expertise. This standard should also be extended to instructors. It required a great deal of expertise to master the technical side of the curriculum (i,f,b).

Not only was technical expertise required to achieve high, sustainable results, but also pedagogical expertise. A more thorough discussion of methods of differentiated instruction will take place in the next section. Here, however, it was appropriate to focus on instructor's classroom management ability as an expertise.

Classroom management proved essential in a room full of delicate and expensive technology. A veteran technology certification teacher put it like this:

> If you don't have good classroom management, then your equipment is not going to last very long. You have got to lay out clear expectations and then follow up on those expectations all the time. If you don't, kids are going to be running around and tearing up your lab. That is not good for anybody. Other classes don't have to deal with this type of problem. It is just one more added responsibility. (i,f,k)

A classroom can be damaged to destroyed in a matter of minutes if clear expectations and follow through were not set initially and reinforced daily. English, Math, Humanities and

Physical Education did not have to worry about this type of management. Good management, however, remained critical for the success of any IT certification program.

Challenges

The challenges posed by limited resources in a field that changes in rapidly and continually were unique to CTE generally and IT specifically.

    The speed of change. The mind-numbing evolutionary growth exhibited with technology stretched the capacity of teachers. Change demonstrated itself inherent in technology classes that simply did not exist in other courses. Take algebra for example, how much had algebra really changed in the last10 years, the last 100 years? The answer could only be, "not very much." Technology, on the other hand, changed in real time. Mobile computing, networking, application platforms, web applications, virtual storage and cloud computing provided just a few examples of rapidly expanding and evolving technologies. Many of these technologies did not exist just a few short years ago. As a result, the demands of industry proved to be constantly evolving. Education via industry level technical certification answered the call to provide adequate training (i,f,e).

    Other changes also occurred across the board and affected schools, staff and curriculum in a much broader way. Legal changes often preceded curricular change. Local policy changes in magnet programs or student assignment plans often drastically changed a school's population. Pedagogical practices also changed with cultural expectations and pressures. Keeping up with all of the change required more time and effort from a teaching population that were already thinly stretched.

    Keeping up with materials was a constant battle. Changes in operating system platforms and application versions always moved much faster than course material.

Complicating this picture were subsequent funding and procurement activities. Textbooks sometimes had as much as a two year lag behind software upgrades. It was often the case that teachers used materials one or more generations obsolete. One faculty member, Kent, put his frustrations like this:

> We have been waiting on textbooks for years. We only get new texts once every seven years. For English, this is OK. But, for tech classes, it is a travesty. The books that we will receive, the new books that we have not even got yet are already out of date. No, that is not quite right. I meant obsolete. It makes teaching quite a bit harder. (i,f,k)

As a result, adaptive practices, developed by teachers individually and often shared within the department, proliferated. Keeping pace with the demands of technological changes remained challenging.

District level interference. Complicating district interference was a constant problem at FCHS. Computer education division of BRUSD had the responsibility of managing the district network, several application platforms, security filters, virus management and much more. A problem existed in that FCHS had developed and maintained programs that are years, if not decades above and beyond the capacity of the district. For example, the district wanted all labs to join the Big River domain. This allowed for maintenance and control. Joining the Big River domain tremendously slowed down the network testing center at best and was an outright conflict at worst (i,f,b).

The FCHS technology certification curriculum required that they maintain a testing center which used software incompatible to the Big River domain and network. Several times per year, teachers came into their lab to see that massive and important changes, made to their machines remotely, frustrated their best efforts. This often caused

exacerbated hardship and grossly inefficient use of time to track down the problem, remove software, restore software and reinstall data files. One veteran teacher Mabel said:

> Lost data, my kids all lost their data. It came during the last migration thing that should have been done over the weekend, but was not. The kids log in and all of their data is gone. I look like an asshole to the kids because they are blaming me, throwing up their hands. They changed the admin rights on my computer. I am not even an admin for my own lab. They pushed out all of these changes without even testing them. Again! (i,f,m)

Many faculty members saw the district much more as an agent of interference rather than an institution for support. A veteran instructor, Bengal described his frustration with district interference:

> They added me to the Big River domain again. Now I can't see my server and my machines don't see each other. They did this once this year already, over the summer after they had remotely screwed up my startup sequence in BIOS. I had to go and fix every machine. I am so sick of getting my lab just like I need it and then they [district computer support] coming in and screwing it up. The kids are put on a schedule and when that schedule is disrupted for any reason, it puts an unfair stress on them and me. (i,f,b)

The technology faculty at FCHS spent hundreds of man-hours setting up and managing labs. These hours often went unpaid. A vocal contempt for BRUSD computer education services rang out from nearly every staff member, certainly the veteran members. When asked about the competency of computer education and support competency, Kent said, "You mean those elementary school teachers who don't know jack" (i,f,k). Another well respected faculty member, Joe Bob, summed it up like this, "They don't want to be here and we don't want them here. It is a perfect arrangement" (i,f,jb). The arrangement, however, seemed far from perfect and much more akin to wastefully inefficient.

Personnel turnover. Staffing proved problematic for BRUSD schools. Typically, the most challenged schools experienced the highest turnover. The faculty at FCHS, however, constantly lost and added personnel for a wide variety of reasons. Falls City High School was categorized as a, "flagship" school with many excellent programs. The faculty members at FCHS wanted to work here. Many visitors used descriptors like: young, energetic, professional and dedicated to describe the staff. Turnover happened here, like many other places due to life changes, career changes, retirement, promotion and an occasional firing. Staffing, particularly Technology Department staffing was complicated by district transfer policy and state teacher accreditation guidelines. Freshman and advanced IT certification classes, called for a blend of IT and teaching skills that were hard to come by. Transfer policies often demanded that an unqualified teacher be given a job. This practice demanded strategy in short term and long term staffing fulfillment. Acquiring and retaining quality instructors who were willing to undergo the circuitous training and retraining required to stay cutting edge appeared to be felt acutely at FCHS (i,f,jb).

Student Inputs

The previous section discussed the inputs in a general sense. The following section discusses student inputs as they are able to answer the research questions?

Student Effort. Many students worked harder in IT certification classes than they did in core classes. When asked if they put forth more effort, Abbot responded, "I realized that this class was very hard, so I tried harder....I believe it makes you work harder" (i,c1,a). Another student, Briana summed her effort up like this, "All the effort I can give" (i.c1.b). Frank talked about his effort level, "If the work is harder, then I try

211

harder. Like if we have a [hard] assignment, I try harder" (i,c1,f). Kenneth, another

student articulated his feelings about effort:

> Yeah! I try harder. I am going to have a career in my life that has to do with
> computers. And, I am also taking business classes this year. I want to own my
> own business selling and working with computers. This [class] is really helpful.
> (i,c,k)

A senior student, Zed, summed up his experience:

> The workload from the IT certification class was substantially more than any of
> the other classes I took that year. Possibly more than all of the other classes
> combined. In the same way, I understood the reason behind that. I wish now that
> the other classes would handle everything the same way as the certification course
> did. (i,c4,z)

Value-Added Instruction

The certification component added additional rigor to the class that many students

responded to. When asked if they would work as hard in a class that did not offer

certification some students responded they would not. Abbot says that he would,

"Probably not" work as hard (i,c1,a). Another student, Paul says that he would not work

as hard in a class that did not offer certification, "Because the class with the certification

looks better… They'll say, 'Oh well, he did well here', so I'm more likely to get a job

for doing well in these courses" (i,c1,p).

Some of the cohort 4 students also shed light on value added instruction. Many of

the students did not highly value the certification status, but instead drew motivation from

parents or from grades. As they grew older, however, the benefits of certification status

began to become evident for many. Salina said that being IT certified, "got me the job"

(i,c4,s). Another student, Cutbert:

> I think it will really help. I just applied for a paid internship with the DEA and I
> put down my certifications on the application. I am hoping that when they look at

my résumé and see certifications in exactly the work I will be doing, they will put me ahead of everyone else. Give me an edge. (i,c4,c)

Another student, Zed, described his view about added value and effort:

> Back then, I don't think I would have put forth nearly as much effort as I did. Even at the beginning of the year, when we first got the syllabus and started on definitions, I didn't put as much effort as I should have. But as I started to realize that I need the certification and the certification would be with me the rest of my life, I turned it on and began to focus on what I needed to do to get my certification. (i,c4,z)

Still another student, Tom described his perception about certification value:

> I know that my certification helped me get a job. They asked If I had any certifications. They said they looked at those as very important. I listed my IC3 certification and that helped me get that job. (i,c4,t)

Many students, however, indicated they were primarily interested in grades. Mary held, "I think from my freshman year on, I have remained self motivated. I always had a 4.0 and I wanted to keep my 4.0" (i,c4,m). This type of planning and forward thinking was the exception, rather than the norm. Many students came to realize the value that certification would afford them later in life. When asked if she would have worked as hard in a non-certification class, Brooklynn stated, "I would not have worked as hard. It is just a grade then. But with this [certification], you have something to put on your resume for years to come" (i,c4,b). Another student, Zed, described even a more sophisticated view:

> I expect it will help a lot with internships. The class, not just the certification, is that I learned Office, but the workload adds another element I think. It adds sort of a responsibility, like task management. Those are not things that you can put on your resume, but are things that will show up in your work. (i,c4,z)

For many young people, getting the grade was not enough. Obtaining a certification and the benefits that certification allotted, however, gave them additional motivation to perform at high levels.

213

Teacher Style

Instructor expectations and style was very important to the amount of effort that students put into their certification class. Some students put forth very little effort in response to teacher expectations. Cutbert said, "Others in other IT classes, they would be doing nothing. We were doing all the work in ours" (i,c4,c). It was made clear from student interviews that one's teacher directly affected not only the workload, but also the value students placed on their work. Roy, a soon to be engineering student, recalled his certification experience, "My workload was very light my freshman year and my IC3 class did not add to it" (i,c4,r). Many students interviewed held a similar position. Roland, an award winning art and music student summed up his experience, "There was nothing after school really. Just what we did in class. No homework. We put lots of effort into class and I put equal effort into all my classes" (i,c4,r). Regardless of the teaching style, each instructor valued the aspect of motivation and class structure. Each instructor interviewed considered themselves excellent motivators and saw that ability translate into student achievement, regardless of pedagogical choices.

Conflicting Data on Effort

While many students professed they worked harder, some students said they did not. Gustavo said, "It is about the same because I usually attempt to do well in all my classes." (i,c1,g). This type of response was typical from several other students. Academic grades remain very important to most of the High-risk cohort. Roberta says, "I need to get good grades in everything" (i,c,r). Interestingly, not one student claimed they tried less in their IT certification class as compared to their core

classes. Students from FCHS cared a great deal about success, respond to additional rigor and kept eye to their own futures.

Industry Inputs

The previous section discussed student inputs as they related to IT certification attainment. The following section discusses Industry inputs.

Software upgrades. As previously mentioned, the software industry moved at a blinding speed. Growth and evolution of software happed in real time. Puts more simply, by the time one received and began using industry standard software, it was probably already obsolete at worst or dated at best.

In response to this dilemma, the IT certification training community often maintained several IT standards. This author had witnessed use of up to three generations of particular software used in just one program. This fact was unfortunately common in the IT certification realm. Such corporate service proved invaluable to schools that had textbook and software adoption cycles of up to seven years. In the technology world, even after three years, most software became obsolete. Keeping older standards alive kept FCHS in the certification game and able to compete at high levels.

Training material. The training material used by FCHS's IT certification programs varied in timeliness, relevance and general quality. We will start this conversation with a review of the classroom text.

The textbook used by the Advanced Freshman Computer Application was obsolete before it was even delivered. Faculty grew used to working with outdated materials. Due to the rapid change of industry standards, planning for textbook adoption

based on current industry demands proved utterly impossible to do well. The reason, limited resources for hardware, software and training material.

Exacerbating the textbook timeliness problem was textbook accuracy. Literally dozens of errors and discrepancies exist between the authorized training material and the certification exams. Only by use of multiple materials and sources did an individual teacher or student reconcile the errors and disconnect. New teachers, however, found this problem frustrating as did their students.

Departmental reliance on one source of training material disappeared years ago. Multiple sources made certification attainment possible, but never was the process simple or easy. Industry, however, provided such materials in the form of websites, video, supplemental training software and practice testing software. It was often impossible to convey a concept without additional and available industry resources. General opinion waxed against heavy reliance on traditional course texts. Staying cutting edge required ingenuity, hard work, collaboration and diligence and was clearly demonstrated by faculty.

Input Summary

The Input section of this work dealt with a variety of issues relevant to one IT certification program. In summarizing these data, however, four major themes emerged. The following section discusses these four topics.

First, IT certification programs required a large input of funding. Such funding secured personnel, labs, software, books, preparatory licenses and testing centers. Additional training and professional development also tapped into discretionary and categorical funding sources. Funding, while sometimes controversial, came from student

fees. The FCHS IT fee structure was considered imperative to program and student success rates. Additional funds came from the district in the form of categorical and Perkins funding disbursements. These funds, however, arrived in the form of what was best described as a gift. Subsequently, faculty and administration found it difficult to effectively plan for the entire year. Even with adequate funding, infrastructure blockers existed to frustrate faculty and students.

Second, frustrations abounded from faculty and student as a result of school/district incoherence. Clear policy and procedure did not often exist. Lines of communication remained fragmented, at best. At worst, open contempt and hostility existed and was often vocalized by FCHS teaching staff toward the district level IT support division. Numerous examples of lost data, downed networks and remote tampering cost what the FCHS faculty felt like were hundreds of man hours. A clear lack of communication manifested itself between these groups. Such conflict exacerbated existing feelings of isolation, frustration and contempt.

Third, various levels of effort proved instrumental to understanding the Input sections of this study. Students put forth various levels of effort based on their understanding of the benefits they would receive upon proving successful. Various motivations existed for students and faculty. The teaching staff demonstrated high levels of effort and expertise. Complicating this picture however, personnel decisions and student placement sometimes frustrated continuity. Teaching effort remained high and led to enhanced student effort. Increased teaching effort led to increased student effort. Similar occurrences related to high rigor and relevance also had a positive affect on effort.

Fourth, the furious speed and evolution of the IT field fueled frustration and innovation. Constant and continuous evaluation of methods, pedagogical practices, teaching materials, software and technology resources helped to drive faculty expertise and student buy-in. While teaching with outdated books was often frustrating, this fact often facilitated divergence from traditional course materials and methods. More modern resources found their way into instruction. Better assessments created enhanced learning for diverse populations. Innovative pedagogical practices abounded. Finally, an increased pace placed a challenge on teacher and student alike. This fact seemed to enhance and build classroom community and drive student desire to achieve certification.

Process

The previous section dealt with the inputs associated with an IT certification program. The following section contains a discussion about the various processes used by Organization, Student and Industry.

Organizational Processes

The next section deals with the processes used to setup, implement and maintain one IT certification program.

Tracking. The process of tracking, while widely used, carried with it some smack of unfairness. At FCHS, tracking was viewed as a flexible tool to ensure that all students had access to the appropriate levels of rigor. If a student performed poorly, consistently, they would probably be moved to a less rigorous section of the same class. If, however, a student performed well and wanted additional rigor, they were moved up. All sections used the Carnegie Unit system. It was the value of the class that varied with rigor and in the IT department, with certification.

The IT department, particularly for incoming freshman, considered tracking to be an indispensible tool for appropriately placing students based on interest and aptitude. Various formats constituted Pre-tests. In previous years, students were invited into the school to test under supervised and timed conditions. Student scores from this one pretest informed tracking decisions. The faculty, however, felt this model was restrictive in several ways. First, access to information about the test may not have been equal for all individuals despite numerous mailings, emails and webpage notifications. Second, physical access to the test often proved insurmountable, especially for students from distant, low-SES areas. Third, the student may have had a sense of overwhelming mental paralysis due to the new surroundings. Also, they might have been sick.

More recent pre-test models allowed students to take the test multiple times therefore assessing aptitude (score for one attempt) and interest (highest score from multiple attempts). The school webpage listed testing details. Email, flyer and hundreds of calls made to individual households insured that every incoming freshman would be pre-tested, appropriately tested, scored and then placed. Students could now take the test at any computer in the world, multiple times. By August 28, 2011, a great majority of the incoming freshmen had been tested ($n = 458$). Only their best score was used. With all that frontloading effort, a few dozen individuals still had to be tested at school's start. After 20 days, enrollment finalized within its class roster. Getting the right students placed into the right seats was an important part of program success.

Wary of elitist attitudes. The IT faculty at FCHS had maintained an ongoing effort to deliver as much rigor and relevance to as many individuals as possible. To insure this, every incoming student was encouraged to perform as well as possible to

obtain as many industry certifications as possible. In prior years, however, this position was reserved primarily for the academic elite. As the IT certification program grew in magnitude, success and attention, a shift in focus became necessary.

The question was asked, "Why cannot every child be given the opportunity for advanced IT training and possible certifications?" The answers gave way to several innovative pilot programs. The culmination of better infrastructure, developing expertise in scheduling, curricular delivery, pedagogy and testing practices put FCHS on the verge of approving that every incoming freshman will receive this highly rigorous and relevant curriculum.

Pedagogical Practices

There were many different classroom practices used in IT certification classes. The practices seemed to differ with each instructor. Several common threads, however, ran concurrently through each classroom. Each instructor interviewed, however, demonstrated a passion for developing the critical thinking, problem solving and general academic ability within their students. In the paragraphs below, these major themes are discussed.

Motivation. The application of motivation was the fuel that made the whole machine run. Self-motivated students often influenced those who exhibited less enthusiasm. With appropriate levels of teacher guidance, cultures of success were built where students saw the system of rewards and positive attention. Value was placed on the achievement of certification far beyond a mere academic grade. Athletic-style coaching was common. Xerxes said:

> I use the same techniques that a coach would use in a locker room. You build
> them up and then break them back down from where they are and then build them

back up. You vocalize your confidence in their abilities. You push them as hard as you can. (i,f,x)

Pushing individuals academically was often challenging. Incoming freshmen were often overwhelmed by the culture shock of high school for starters. Many 13-15 year old students had never been academically pushed. All instructors articulated awareness of parental concern for weak initial grades and often homework loads. Instructors also vocalized their preference for using multiple methods of differentiated instruction.

Bookwork. The use of bookwork was one model for initial instruction. These certification exams were tough. There was not real way to fake ones way through them. Subsequently, all teachers used bookwork, to some degree, as an instructional tool. At least one instructor Bengal, however, based his instructions style around, but not limited to, bookwork and direct instruction. He said:

> Teaching this discipline is much like teaching a foreign language. Almost all of the vocabulary is new. Many departments have moved away from rote memory and such. What nonsense! How can you develop themes and teach systems if the kids don't understand at the most basic level? The answer is that you can't. I hit this material eight times before we move on. Using the book as an instructional tool is an essential first step. That step is supplemented with direct instructions, assessment, remediation, and reassessment. Reading homework, pre-quizzes, lecture, post-quizzes, remediation, tests, and knowledge validation are used. That is grinding it out. That is being thorough. That is how I do it. (i,f,b)

While elements of these techniques could be found in all of the instructors classrooms, multiple methods of differentiated instruction were the norm.

Project-based work. The use of project based work was also an important way to teach concepts and develop skills. Much of the work, particularly in the first part of the year was theoretical. Those theories and systems were taught and reinforced quite

221

effectively by use of drills and projects. Kent talked about his approach to certification instruction:

> The project based lends itself toward mastery learning. If they [students] don't get it right the first time, we go over and over it again and again until they do get it right. I rely on instruments called study guides that map to objectives. When they have mastered an objective then they would move on to the next objective and the next study guide. This mastery learning also applies to the enrichment activities that I do. Those enrichment activities might be in the form or research activities using the WWW or working with computer hardware. (i,f,k)

Veteran teachers understood that out of 20 students, a successful teacher might have to accommodate a dozen different learning styles. To achieve high levels of certifications, the best instructors used various methods of instruction, reinforcement and assessment.

Hands-on work. The practice of using hands-on instructional practices was yet another method that was regularly used by all instructors. Hands-on work, however, was much preferred as a component of still one other instructor. Xerxes said:

> I think a lot of teachers rely on the book too much. Not necessarily that the book is a bad thing. The book is a tool, but it is not the answer. Read and review is fine. Pulling quizzes and tests out of the book is fine, but if you want them to really excel, you have to move past that. The book is simply the starting point. I have found that the best teachers reference the book rather than rely on the book. Kids have got to get their hands on the technologies they are studying. I use hands-on assignments every chance I can. That is what I have found works the best for me. (i,f,x)

The IT certification course lent itself beautifully toward hands-on work. Many manipulative opportunities existed when a computer box was opened and components examined. Some instructors liked to use junk machines for this exercise; while others, more daring individuals, entrusted working machines to exploring young hands. Regardless of this choice, manipulating-type, hands-on work was an important component to the certification process, particularly at the systems and hardware level.

Practice testing. Indispensible to instructional success proved the use of practice tests as the final component to this pedagogical soup. Several companies made available sold some excellent practice test software. Learnkey, Certiprep and ExamPro all developed and supported first-rate software. These training tools focused on development of the different skill sets required for certification attainment. For a much smaller percentage of students, certification was obtained without practice testing. For the masses, however, practice testing minimized testing validity error in that students became familiar with the testing formats as well as content.

While valuable tools, canned practice test were not all that were used. The IT certification faculty at FCHS often made their own assessments in addition to those provided by certified vendors. One instructor said that by making their own practices tests, they could hone in on deficiencies inherent in premade tests and start, "plugging holes." These assessments were often then shared around the department.

Intangible Character Traits

Personality traits of instructors contributed significantly to student success. While not specifically questioned about such traits, mention of them saturated enough interviews and conversations as to warrant inclusion.

The desire to get it done. This position was a reoccurring theme that permeated several conversations. One instructor spoke of a moral duty to get kids ready for life. Another instructor said that he based much of his professional self esteem on doing a quality job. Xerxes expressed himself:

> Determination to get the job done as best as it can be done is huge. Drive to ensure that the students understand certification is an end result of the course. And, creativity! I have seen a lot of people who decide that this is the thing that

works for me and they do that one thing regardless of what the students are doing. That drives me crazy. (i,f,x)

While determination was a component that filters down from the instructor and into the students, several other characteristics did too. Modeling, while not discussed openly, was a theme that cannot be ignored. One trait that was openly modeled was *confidence born of success.*

Confidence. Assurance and faith proved the end result of hard work, good decision making, perseverance and finally achievement. The IT certification instructors at FCHS possessed numerous advanced IT certifications themselves. These instructors knew first-hand what it took to get certified. Despite the varied instructional methods, each instructor found methods that worked for them and their students. Students seemed to respond positively to the knowledge that their instructors worked class with self-confidence, methodological aplomb and a firm belief in the students themselves.

Competitive spirit. Competition was evident at three distinct levels at the FCHS IT certification classes. First, FCHS consistently achieved finalist ranking in the IC3 World cup. The average age worldwide (over 60 countries) for an IC3 student was 22 years old. Falls City High Schools students' average age for test takers was 15 years old. Consistently ranking in the top schools worldwide, the FCHS community seemed to revel in the attention associated with high achievement. The past several years put FCHS in the show, place, or win status nationally and in the top 20 internationally.

Second, in previous years, inter classroom competition was encouraged. Instructors gauged students from their own classes as well as their colleagues in an effort to motivate students. This technique had proven successful in the past and continues to a

lesser extent now. Personnel changes resulted in greater capacity, but a disparity in experience. As skill, experience and success developed, so too did inter-class rivalry.

Third, teachers encouraged students to compete most earnestly with themselves. Multiple graded assessments and practice tests gauged students' personal growth. Multiple certification attainments exponentially increased confidence and subsequent performance of students. Again, coaching experience was used to enhance student achievement. Competition was a key element embedded within the FCHS IT certification programs.

Challenges

While alluded to in several sections above, the paragraphs below will elucidate specifically the process challenges under review.

Scheduling challenges. Falls City High School was a large school comprised of about 2,100 students and over 100 faculty members. Diverse programs offered each student the opportunity for choice in preparing themselves for their post-secondary lives. Many of the programs achieved state, regional and national acclaim. It was very difficult to manage scheduling for the many excellent elective programs and required core curriculum. Further complicating this process were individual student needs, teacher characteristics, tracking requirements, accountability standards, special needs requirements and program competition. All these concerns took place in a high-stakes, high-accountability environment. Exacerbating this already complex situation was the fact that young people frequently changed their minds about programs, classes and the teachers they wanted. One veteran counselor Davina summed it up like this:

> One of the things that we are cognizant of is the request. Students change their minds. What they pick, they need to stay consistent. X amount of student

requests come in and we make decisions based on that request. We get what happened in the class. I don't want this or that teacher. I have to be with my friends. It makes scheduling a really tough job. (i,f,d)

Scheduling demands for a large, complex school often seemed daunting. Telling students and parents news they did not want to hear often deescalated relationships from mild reservations to open hostility.

The challenge of increasing levels of effort. Performing in highly successful programs, particularly for freshman students, was a struggle that most teachers dealt with. This challenge, however, was acutely felt by Advanced Programs (AP) and IT certification teachers. These classes demanded that students learn, retain and prove knowledge or skill attainment on a test. Certification tests, in particular, were specifically designed to be non-intuitive. Course curriculums were often brand new for students. The call to achieve at higher standards was a struggle that required daily attention. Ellen talked about her experience in raising standards:

> I let them fall and fall hard. I want them to see failing grades, and their parents. I stop coddling them. Playtime is over. I tell them, it is your responsibility, your choice to succeed or fail. It is all about teaching them to fish [parable]. Another thing I use to raise standards is to teach about knowing where to get resources and how to be resourceful. (i,f,e)

These types of sentiment were echoed throughout the entire IT certification staff. Another teacher Karen professed, "They know how to memorize. It is not about that anymore. I really am teaching critical thinking and problem solving. Memorization is just the start" (i,f,k). Many students entered these programs without ever having a C or a B in their lives. Students and their parents were often surprised (or shocked) at the scope and speed of curriculum delivery. Clear evidence of shock was a normal response for parents to see failing quizzes, tests, and grades that subsequently follow weak

performances. Another teacher says, "It is a growth process. These kids are used to slacking and still getting A's. Except for a special few, it now takes hard work and lots of it" (i,f,k). Raising expectations for levels of effort was an ongoing struggle that seemed to get easier as students begin to have initial successes.

Conflicting Interests

Systemic conflict presented additional challenges at FCHS. Many young people came to FCHS for one program specifically. Some of the programs like athletics, band, orchestra, JROTC and several others required a massive time commitment. On one hand, large time commitments often forced youngsters to become more efficient time managers. On the other hand, extensive time requirement from multiple sources forced students to make decisions about where to spend their time. For many students, time management was not a simple choice; but instead, it was often an agonizing growth process.

Student Process

The previous section discussed the processes one organization used to deliver IT certification curriculum. The following sections discuss how student processes are used in regards to answering the study research questions.

Process reciprocity. This author initially hypothesized that the nature of IT certification generated multiplicative generation of opportunity factors. Data collected from students suggested a more direct relationship with curricular processes that were best described as reciprocal. Donna, when asked about the affect IT certification training had on her other classes replied, "I think it defiantly helps me in other classes, for my AP Human Geography" (i,c1,d). Another student, Jeff described his experience, "Right now,

it just helps me with projects. In my ROTC class, we were having troubles in Excel and I used my knowledge to fix it." (i,c1,j). Still another student, Malika illuminated her position, "For my one class, we had to do a slide show and with my IC3 knowledge, make it better. I think that in Excel, the equations help when we work during Geometry class" (i,c1,m).

When asked if IT certification training made the students more efficient academics, Neil stated, "It makes me think things through better. Like I feel if I can't find a solution to a problem [easily], I can find it somewhere else...I think it is connected" (i,c1,n). Isaac put his position clearly, "I would say I have become a more efficient student" (i,c1,i). Many of the students articulated certification in concrete terms of résumé building and potential employment rather than in the abstract language of constructs. Given the youth of the sample, this outcome, while unexpected, was not surprising.

Conflicting Data

Well over half the High-risk cohort was able to express a positive connection between IT certification training and increased work quality elsewhere or increased academic efficiency; a much smaller portion of the sample held a different position. Otis said, "I wouldn't say it affects it too much because we don't work as much with computer in my other classes" (i,c1,o). Otis went on to say, "In biology, we made a slideshow and it [IT technical training] helped to change the theme and settings and colors around...it made my work better" (i,c1,o).

When asked about becoming a more efficient academic, Paul stated, "I haven't experienced it yet" (i,c1,p). In a later question about academic growth, however, Paul

answered, "I have grown a lot more in my computer class than any of my other classes" (i,c1,p). Paul seems a little mixed up in his answers. This researcher found this the case with several students who struggled in articulation. Interestingly however, no student stated that there was a negative affect or that they thought the training was not valuable in and of itself.

Challenged and Loving It

When asked about the difficult high-stakes, high-pressure nature of IT certification content and testing, many of the students replied that they, "Liked the pressure" (i,c1,d). Jeff explained, "I feel like I could do it because under the pressure, I can work better than not being under pressure" (i,c1,j). Otis explained:

> I feel like it is fair because if it was really easy, people would be able to go through it really fast and not learn anything and it would not be fair to the people that actually tried…it's necessary for it to be hard. (i,c1,o)

Of the six students directly questioned about the topic of challenge, five of them responded that they liked or preferred high-pressure to the alternative. Students valued the rigor of the training and testing and as a result, increased the perceived value of the many IT certification product outcomes.

Industry Process

The previous section discussed student process results. The following section provides a brief review of industry process expectations. To collect data for this section, this author interviewed, via meetings, telephone conversation and email, over a 20 industry product specialists, product developers and sales representatives.

Methodological commercialism. All of the industry professionals this author interviewed held the position that if a program wanted to certify more IT students, all one

needed to do was to purchase their proprietary media (i.e., films, books, software). Few

of the products proved themselves adequate, while the vast majority of media were

rejected due to some combination of excessive cost or inferior quality.

When this author asked the head of development for a major IT certification

company why the study materials do not map directly to the stated objectives or the

exams, he responded:

> Well, we don't want it to be too easy. It is supposed to be hard. There has to be a
> full understanding of the systems and processes involved. There has to be rigor or
> the value of the program will diminish. Also, the preparatory programs are
> designed to fill some of those gaps. (i,ip,d)

This perception elucidated the need if the IT certification industry to keep rigor high.

Industry members remained virtually silent on issues of process and pedagogy. There

was a general position amongst industry professionals of two key concepts.

Results justify the means was a position held by many industry professionals.

The industry professionals from the IT training and certification companies that

responded to this author placed heavy weight on industry certification. Much less value

was demonstrated for traditional academic work. One Certiport executive said, "IT

certifications are the most valuable thing a job candidate or employer can use..." (i,ip,ks).

Another executive held, "IT certification is better than having a four year degree in

computer science" (i,ip,kt). Still another executive wrote, "Non-certified individuals can

say all they want, but the fact is that the certified individual has the proof [of skill] with

their Official Certification" (i,ip,as).

Experience was also marginalized by proprietary industry professionals unless it

was generated by certification attainment or training. The executives interviewed exuded

confidence in their products as well as confidence that all good things would come from certification attainment.

Modern natural selection, of a form, permeated many conversations surrounding IT certification. Industry professionals took pride in the fact that certification attainment was not for everyone. Also, they strongly favored the position that individuals who held certification would, "stand out from the crowd" (i,ip,d). Another related perspective promoted a feeling of selectivity in that certifications proved a person, "could take a bit more stress and can think well on their feet" (i,ip,jr). Still more evidence for exclusivity was a statement made by another executive in that attaining one's certification tendered a, "feeling of joining a club, they [certified individuals] have the feeling of unity with others that have the same certifications" (i,ip,jb).

A Caveat

While it was made apparent that most industry professionals felt that almost anyone could attain certification if they "worked hard", the reality was that industry professionals also acknowledged the fact that many people could not or would not put forth such effort. This position was somewhat at odds with the mission of schools to educate all students.

Second, it was virtually ignored that timeliness of certification attainment was an important condition in applying benefits of certification attainment. Technical skills, particularly specific, proprietary skills are perishable. This concept proved problematic for two reasons. First, memory and skill diminishes over time, particularly if skills are not used. Just because someone once had a particular skill set, does not guarantee that they have retained it. Second, the speed and evolution of technology demanded that

231

technically literate workers remained well-rounded and adaptive (Kay & Honey, 2005).

It may not be completely accurate to hold that certifications provide the full stamp of

approval, skill, or confidence to the extent they were being marketed to endow.

Process Summary

Six major themes emerged during the data collection and analytical process of this

study. The following section provides a summary of those findings. First, getting the

right students into the right seats proved challenging even for a veteran administrative

and teaching staff. Falls City High School used a flexible-styled tracking program to

help accurately place freshman IT students. All incoming freshman were pre-tested.

Students took the placement test online and could re-test an unlimited number of times.

Use of this technique allowed for accurate assessment of both aptitude (first test score)

and interest (multiple tests). The top half of all students were place into advanced IT

classes.

Due to management of a large, complex school, transfers became necessary.

After the first twenty days, classes stabilized including a class made of entirely high-risk,

highly skilled or motivated individuals ($n = 18$). The high-risk cohort (c1) allowed for

data collection and analysis that dealt with RQ2. Cohort 2 (c2) was comprised of mixed-

risk individual who were highly motivated or highly skilled ($n = 171$). Cohort 3 (c3) was

comprised of the bottom half achievers and populated the regular freshman IT courses ($n

= 188$). Cohort 4 (c4) comprised individuals who had taken the advanced IT curriculum

3 years prior and were imminent graduates ($n = 402$).

Second, Motivation proved to be indispensible to keep work proceeding at high

levels. Teachers used various motivational methods including benefit to students, college

credit potential, job placement potential and old-fashioned, athletic styled coaching techniques. Keeping students motivated sometimes proved challenging. Often, classrooms comprised of a multitude of personalities and abilities required multiple techniques. Those techniques are discussed below.

Third, various pedagogical techniques helped ensure learning at a high level and fast pace. Some teachers favored bookwork while others more heavily relied on project-based learning. Pre-test, Post-test, remediation models also helped identify learning gaps. Those gaps became filled by use of various instructional and assessment techniques including learning validation that was similar to rote memorization drilling. Student data analysis demonstrated that individuals responded to different instructional techniques. As a result, multiple and adaptive methods became commonly used by instructors.

Fourth, rigorous material and pace challenged students. Many students liked and responded to that challenge. While it was common for the instructor to challenge students, other dynamics came into being. Students competed amongst themselves. When students failed to achieve passing grades, classroom encouragement and good natured jibes quickly followed. Often, a second round of remediation and testing caught a struggling student up. Occasionally, a student required more direct and personalized attention for either the instructor or a student tutor. The best form of challenge was demonstrated when a student would challenge themselves. The internalization of the motivation and processes required for an individual to learn at high levels was an elusive, but occasionally obtainable goal for instructors and students.

Fifth, students benefited from a form of academic reciprocity. This author theorized the educational benefits of IT certification training were multiplicative. Student

data however, instead showed a more sophisticated phenomenon described as reciprocal learning and reinforcement. Students reinforced and refined the skills learned in the freshman IT certification class by completing superior quality work in other classes. Production of such quality work in other classes lead to increased levels of confidence and subsequent effort put forth in their IT certification class. These processes fed off each other to develop more sophisticated work, as well as more skilled, confident and motivated students.

Sixth, the phenomenon of increased quality of work combined with increased motivation and confidence manifested itself in greater certification attainment. Teachers, building upon initial successes, demonstrated an understanding of value-added-instruction. Certifications proved themselves a byproduct of skill attainment. Success built upon success which demonstrated itself in increased motivation and even greater skill attainment. Study skills, retention, memorization, systems thinking and problem solving came easier to students as they progressed through the year. The very nature of IT certification training helped to develop more rigorous and efficient academics.

Product

The previous section discussed the processes involved with an IT certification course. The following section will discuss the end product from the perspective of organizations, students and industry.

Organizational Products Produced

There were several products generated by IT certification programs that directly or indirectly can be attributed to schools generally and CTE specifically.

234

Certifications. The most immediate short-term indicator of IT program success or failure was certification. Certifications were easily quantifiable, therefore easily tracked. Many of the other excellent products of CTE, were not easily tracked and therefore eschewed.

While there were several ways to look at certification attainment, two methods seemed prevalent. First, organizations tended to look for the total number of certifications attained. This number was then transferred into a schools accountability score. Various models existed for how this number was used (Perkins), in a formula that calculated career readiness. Just recently, as defined by Kentucky Senate Bill 1 (2009) a bonus was approved for individuals and schools that were college and career-ready (based upon an academic and testing formula) and certified. On one hand, schools gleaned a 1.5 credit per certified individual provided individuals proved themselves at least three year program completers. On the other hand, a non-certified, career-ready individual achieved a score of 1.0 as determined by the ACT, COMPASS, or KYOTE exams. Certifications became a more powerful and useful indicator of individual and school success.

Second, state, district and school administrations also were interested (at varying levels) in the percentage of students in a program who achieved certification. This method allowed for smaller cohorts to demonstrate the quality of their program as reflected in percentages of student certification attainment.

Figure 6., located below, detailed the relationship between Perkins funding, particularly as it related to program accountability.

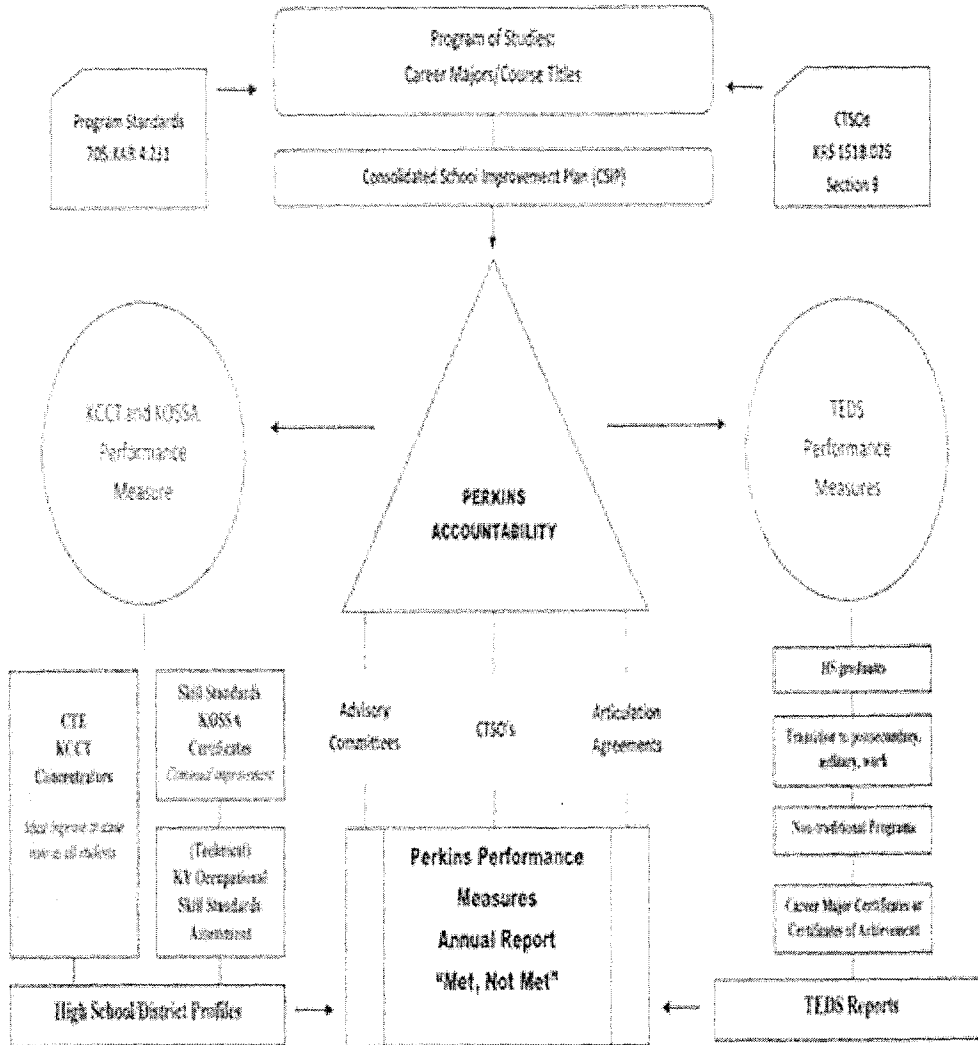Perkins Accountability-College and Career Readiness Formula

Figure 6. Taken with permission from BRUSD Department of Career and Technical
Education, this figure demonstrates the complex nature of calculating a school's
college and career readiness score (2011). Failure to meet annual goals will trigger
punitive measures including loss of discretionary funding, loss of employment, and
possibly school reconstitution.

Statistical Exploration

While this study was conducted from an interpretive design and perspective, use of statistical data and tests complimented interpretive methods. Data triangulation provided for additional rigor and generalizability. Descriptive statistics, Analysis of Variance, Levene's Test for Homogeneity of Variance and Post-Hoc tests enhanced this study.

Descriptive statistics. Senior students ($N = 402$) who held multiple certifications ($n = 247$) scored significantly higher ACT scores than students who held either one certification ($n = 81$) or none ($n = 74$). Descriptive statistics for ACT scores from various groups included group 0 which returned ($M = 20.97$, $SD = 4.63$). Group 1 returned ($M = 22.38$, $SD = 4.08$). Group 2 returned ($M = 23.74$, $SD = 4.36$). The null hypothesis H_0 held that no differences existed between group means. Race and gender exploration remained outside the interest of this study.

Levene's test. Statistical analysis tested for equality found these data to be in compliance with the assumption of homogeneity, $F(2,399) = .814$, $p = .44$. Put simply, the groups examined were normally distributed. For this reason, the H_0 failed to be rejected.

ANOVA. Statistical comparison of means by ANOVA was performed on the three groups. Comparison was made for ACT scores as they related to certification Attainment.

Results between groups were found to be statistically significant, $F(2,399) = 12.383$, $p = 0.00 < .05$. This result indicated a positive relationship between certification attainment (IV) and ACT scores (DV). These results, while statistically significant, were

blunt. Use of a Bonferroni post-hoc analysis teased out greater detail from the three

studied groups of graduated seniors.

Post-hoc. The relationship between groups with zero to one certification and

ACT scores was positive, but non-significant ($p = .134 > .05$). The relationship between

the groups that obtained one to two-or-more certifications did, however, prove

statistically significant, ($p = .046 < .05$). This result suggested a positive, significant

relationship between certification Attainment and higher ACT scores.

Table 4.

Bonferroni Post-Hoc Test Results Examining Certification Attainment and ACT

	(I) AllCerts	(J) AllCerts	Mean Difference (I-J)	Std. Error	Sig.
Bonferroni	0	1	-1.410	.700	.134
		2	-2.768*	.577	.000
	1	0	1.410	.700	.134
		2	-1.358*	.558	.046
	2	0	2.768*	.577	.000
		1	1.358*	.558	.046

Note. Significant at .05. This test achieved statistical significance between groups 1 & 2
($p = .046 < .05$) and groups 0 & 2 ($p = .000 < .05$)

The final comparison, interestingly, returned the strongest result. When

individuals who obtained zero certifications were compared to individuals that obtained

two-or-more certifications, significant differences occurred that pertained to increased

ACT achievement, ($p = 0.00 < .05$).

238

The histogram below was useful in understanding the relationship between certification attainment and ACT achievement.

ACT & Multiple Certification Attainment Histogram

Figure 7. Histogram of plotted means generated by SPSS provides a visual representation of the relationship between certifications attained and ACT scores.
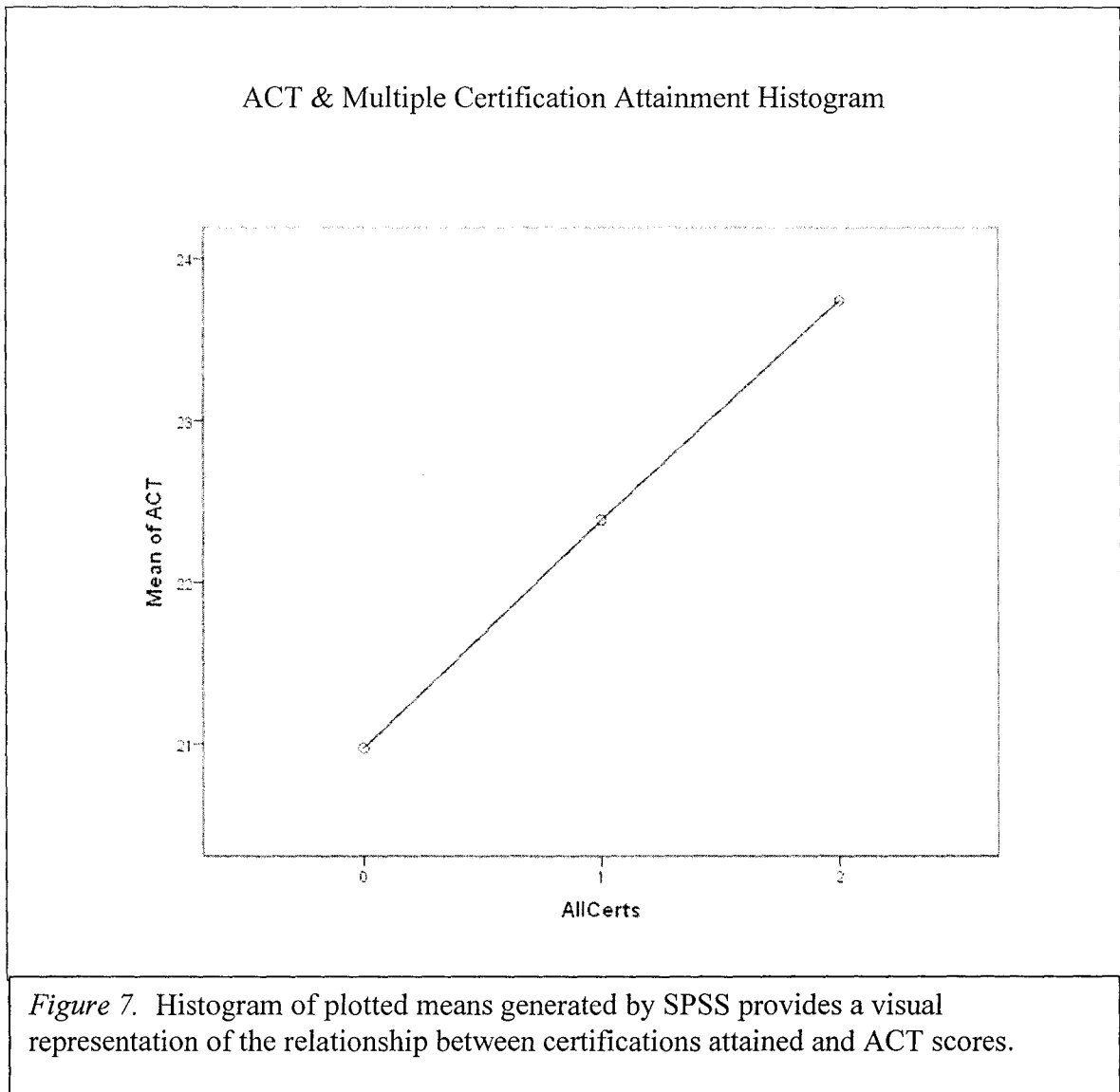
Certifications and GPA

This study worked to understand if there existed a relationship between certification attainment and greater student achievement. One common measure of student achievement was GPA. The statistical tests below explored any such relationship between certification attainment and GPA. Descriptive statistics, Analysis of Variance,

Levene's Test for Homogeneity of Variance and Post-Hoc tests more thoroughly allowed this researcher to explore the research questions.

Descriptive statistics. Senior students ($N = 401$) who held multiple certifications ($n = 247$) scored significantly higher ACT scores than students who held either one certification ($n = 81$) or none ($n = 73$). Descriptive statistics for GPA scores from various groups included group 0 which returned ($M = 2.97$, $SD = .73$). Group 1 returned ($M = 2.96$, $SD = .70$). Group 2 returned ($M = 3.10$, $SD = .66$). The null hypothesis H_0 held that no differences existed between group means.

Levene's test. This statistical test for equality found these data to be in compliance with the assumption of homogeneity, $F(2,398) = .1.817$, $p = .164$. The groups examined for GPA and certification attainment were normally distributed. Based on these data, this researcher failed to reject the Null Hypothesis, H_0.

ANOVA. This statistical test focused on the three certification groups and returned significant results between groups, $F(2,398) = 6.175$, $p = .002 > .05$. This result indicates there was a relationship between certification attainment (IV) and GPA (DV). ANOVA testing demonstrated a relationship between student grades and certification attainment. A greater understanding of these data required use of a Bonferroni post-hoc analysis. This test provided more detail from the three studied groups of graduated seniors. The relationship between groups with zero to one certification and GPA was positive, but not significant ($p = .352 > .05$). The relationship between the groups that obtained one to two-or-more certifications failed to reach significance, ($p = .342 < .05$). The final post-hoc comparison result suggested a positive, significant relationship between certification attainment and higher GPA scores.

Post-hoc. Individuals who obtained no certifications, compared to students who

obtained two-or-more certifications, returned the strongest results.

Table 5.

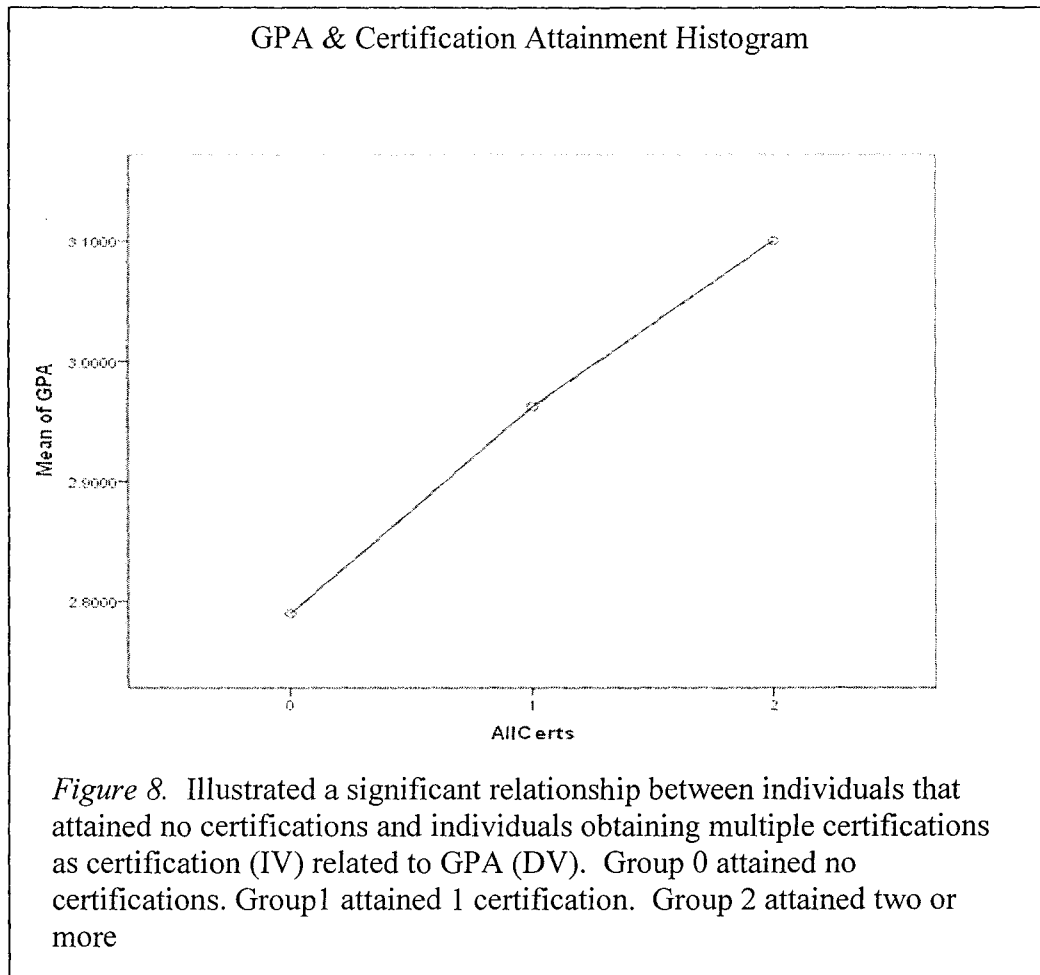Bonferroni Post-Hoc Test Results Examined Certification Attainment and GPA

(I) AllCerts	(J) AllCerts	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
0	1	-.1724962	.1098906	.352	-.436689	.091696
	2	-.3105574*	.0907129	.002	-.528644	-.092471
1	0	.1724962	.1098906	.352	-.091696	.436689
	2	-.1380612	.0871866	.342	-.347670	.071548
2	0	.3105574*	.0907129	.002	.092471	.528644
	1	.1380612	.0871866	.342	-.071548	.347670

Note. Significant at .05. This test achieved statistical significance between groups 0 & 2 ($p = .002 < .05$).

Significant differences between these groups occurred that pertained to increased

GPA achievement and multiple certification attainment, ($p = .002 < .05$). Another

histogram demonstrated this relationship clearly.

Certification and Scholarships

Another measure of student success was the ability to pay for higher education

based upon scholarships achieved. The following section explored post-secondary

scholarships achieved as they related to IT certification achievement. Students provided

self-reported scholarships obtained. Student data were cross referenced with state-level

academic awards (KEES) and verified with institutionally reported awards.

Figure 8. Illustrated a significant relationship between individuals that attained no certifications and individuals obtaining multiple certifications as certification (IV) related to GPA (DV). Group 0 attained no certifications. Group1 attained 1 certification. Group 2 attained two or more

Descriptive statistics. Senior students (N = 402) who held multiple certifications (n = 247) won significantly higher scholarship amounts than students who held either one certification (n = 81) or none (n = 74).

Descriptive statistics for scholarship dollars awarded to various groups included group 0 which returned (M = $2,515, SD = $4944). Group 1 returned (M = 3,416, SD = $6,106). Group 2 returned (M = $5,216, SD = $9,190). The null hypothesis H_0 held that no differences existed between group means.

242

Table 6.

Descriptive Statistics for Three Group Levels of Senior Certification Attainment

Money

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
0	74	2515.41	4944.306	574.764	1369.90	3660.91
1	81	3416.47	6106.349	678.483	2066.24	4766.69
2	247	5216.13	9190.152	584.755	4064.36	6367.90
Total	402	4356.36	8059.843	401.988	3566.10	5146.63

Note. Descriptive statistics dealing with certification attainment and college scholarship dollars awarded.

Levene's test. This test of homogeneity found these data to be unable to meet compliance with the assumption of homogeneity, $F(2,399) = 6.110, p = .002$. The groups examined for Scholarship attainment and certification attainment were not normally distributed. Rather than include the failed Levene's table, Figure 9. below illustrated a possible reason why Levene's test of homogeneity failed with these data. Based on these data, this researcher rejected the Null Hypothesis, H_0. There existed significant difference between group mean variance.

To help explain this difference, a frequency distribution chart was helpful. The histogram above demonstrated the uneven distribution on scholarship dollars across the sample population. This fact may have contributed to failed homogeneity of variance. A full discussion of this phenomenon will occur in Chapter Five.

Figure 9. Unbalance distribution of funding may account for failed Levene's.
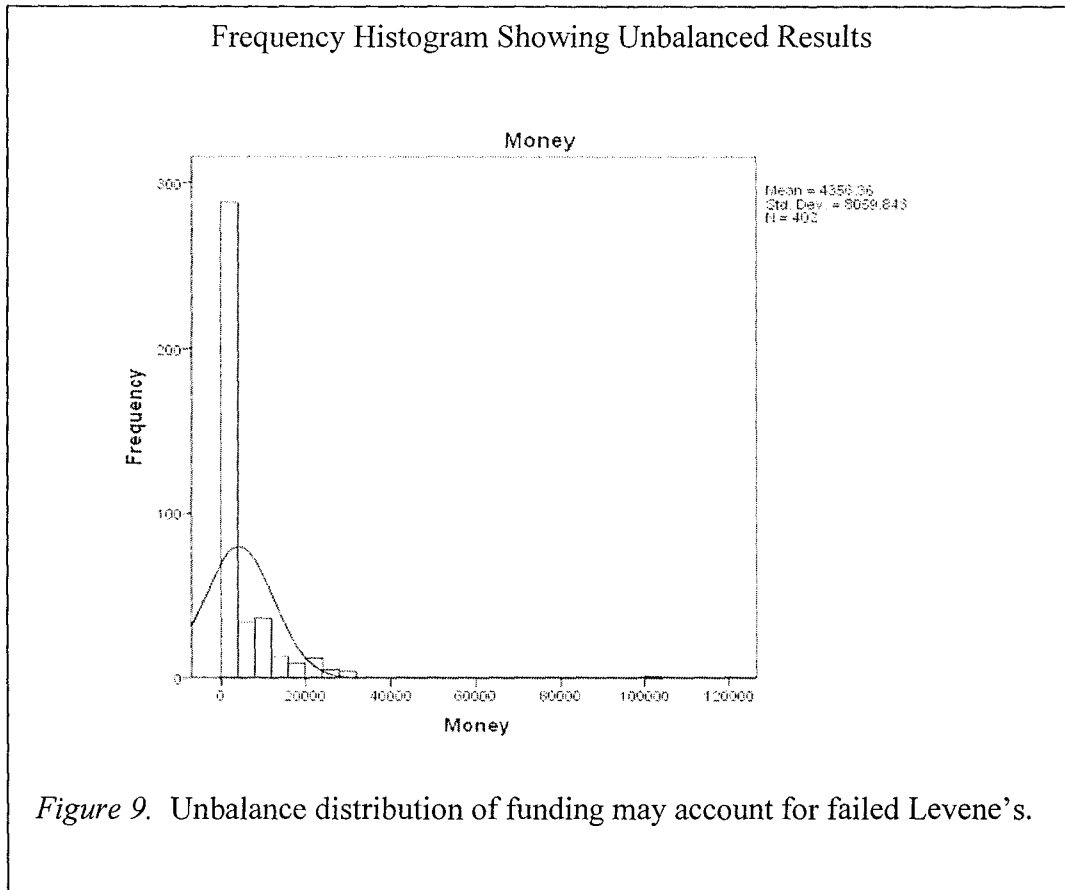
ANOVA. Test using ANOVA on the three certification groups returned significant results between groups, $F(2,398) = 3.943, p = .020 < .05$. This result indicates there was a relationship between certification attainment (IV) and scholarship dollars awarded (DV).

Testing using ANOVA demonstrated a relationship between scholarship dollars awarded and certification attainment. A greater understanding of these data required use of a Bonferroni post-hoc analysis.

Post-hoc. This test provided more detail from the three studied groups of graduated seniors. The relationship between groups with zero to one certification and scholarships awarded was positive, but not significant ($p = 1.00 > .05$). The relationship

between the groups that obtained one to two-or-more certifications tested as not

significant, ($p = .239 > .05$). The final post-hoc comparison result suggested a positive,

significant relationship between certification attainment and higher awarded scholarship

amounts. Individuals who obtained two-or-more certifications returned the strongest

results as compared to students who achieved no certifications, ($p = .034 < .05$).

Table 7.

Post-Hoc Examining Certification & Scholarship Dollars Attained

Bonferroni

(I) AllCerts	(J) AllCerts	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
0	1	-901.064	1286.677	1.000	-3994.38	2192.26
	2	-2700.724*	1060.352	.034	-5249.93	-151.51
1	0	901.064	1286.677	1.000	-2192.26	3994.38
	2	-1799.660	1024.490	.239	-4262.65	663.33
2	0	2700.724*	1060.352	.034	151.51	5249.93
	1	1799.660	1024.490	.239	-663.33	4262.65

Note. Significant at .05. This test achieved statistical significance between groups 0 & 2
($p = .034 < .05$).

Graduates and College Readiness

The graduates from BRUSD should all be either college or career-ready. Better still,

students were encouraged to be college and career ready. The following paragraphs

provide descriptions of what readiness looked like. The following histogram is useful in

visualizing the relationship between certifications attained and scholarship dollars

achieved.

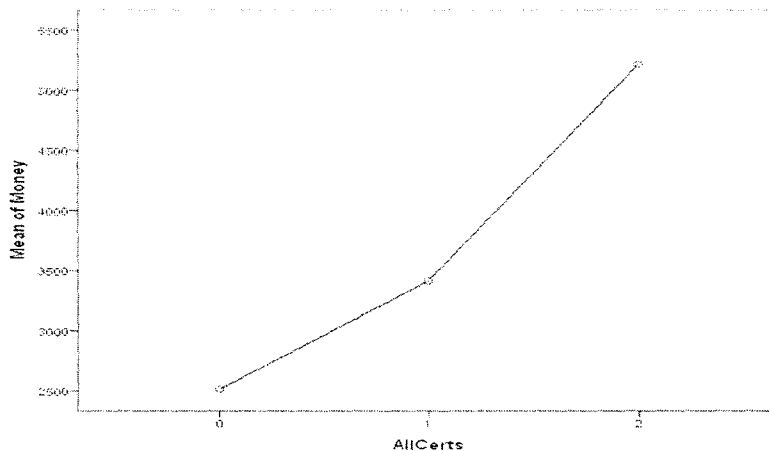Histogram Representing Groups Based on Certification and Scholarships

Figure 10. A relationship between certifications attainment and scholarship dollars obtained.

College ready. This term means that a student had graduated and had scored above benchmark grades for English, mathematics and reading: 18-19-20, respectively. Failure to achieve these ACT scores or their SAT equivalent prevents that student from contributing to the schools readiness score. The highest ACT scores are recorded on each student's permanent transcript record.

An alternative measure was the COMPASS test given to students who perform poorly on the ACT. The COMPASS was an untimed, computer-based test. COMPASS was a placement exam for postsecondary institutions. COMPASS was not a college admission test. The required scores for passing the COMPASS test in English, mathematics and reading were: 74, 36 and 85 respectively.
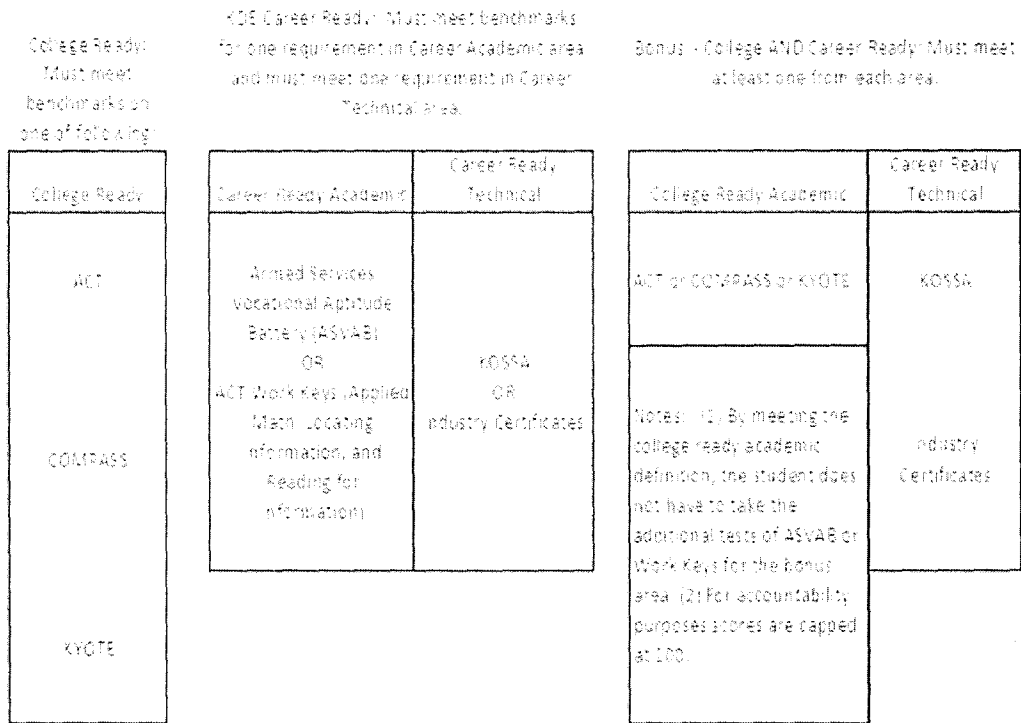
College and Career Readiness

Figure 11. This diagram shows the Kentucky requirements for College and Career-readiness. Flexibility is built in as an individual may use several methods to demonstrate readiness. This diagram is used with permission from BRUSD department of Career and Technical Education (2011). As discussed, Industry Certification can play a large role in determining compliance at the school level.

In the 2011-2012 District Assessment Coordinators Guide, the Kentucky

Department of Education defined College readiness as:

> The level of preparation a first-time student needs in order to succeed in a credit-bearing course at a postsecondary institution. "Succeed" is defined as completing entry-level courses at a level of understanding and proficiency that prepares the student for subsequent courses. (d,g,kde)

If a student cannot pass benchmarks for the ACT or the COMPASS, still another assessment was available, the KYOTE. The KYOTE system was designed for mathematics placement and was used by several state universities, college systems and over 50 participating school districts. KOYOTE was an online assessment system designed to reduce the number of remedial courses taken by new college students as dictated by Kentucky Senate Bill 1 (2009). One benefit of KYOTE was immediate feedback for student and instructor. Plans for expansion of the KYOTE system are underway (d.g.uk).

Career readiness. This concept had various definitions depending on one's point of view. The Kentucky Department of Education defined Career Readiness as:

> The level of preparation a high school graduate needs in order to proceed to the next step in a chosen career, whether that is postsecondary coursework, industry certification, or entry into the workforce. According to the Association of Career and Technical Education (ACTE), career readiness includes core academic skills and the ability to apply those skills to concrete situations in order to function in the workplace and in routine daily activities; employability skills that are essential in any career area such as critical thinking and responsibility; and technical, job-specific skills related to a specific career pathway. (d,g,kde)

The principal of Falls City High School, however, took a more succinct definition to heart. When recently asked if she were sending all students on to college, she replied , "I am preparing every student at FCHS with the tools they will need to be successful in whatever life choices they make" (i,slt,l).

Preparing young people for life seemed to be the thread that ran through all levels of education. The difference at the state, district and school seemed to be one of both perception and accountability. While several instruments were used to enhance clarity of perception and levels of accountability, one's own tools tended to color his or her point of

view. The following paragraphs discuss how student tools were developed and then used.

Supporting Programs

It was a firmly held belief that the technology department in general and the IT certification program specifically, supported all other core academic classes at FCHS. Several reasons supported this belief. First, the general level of rigor and relevance often motivated a student to put forth more effort than a traditional class. The speed at which the curriculum was delivered also forced students to develop time management skills. Balancing various academic, co-curricular and extra-curricular activities forced students to make efficient choices with their time. Since almost all curriculums introduced new content to students, non-academic choices quickly surfaced in the form of poor grades.

Second, MS Word and PowerPoint programs supported communication skill attainment that was used in other classes. Leaning these applications allowed for better quality essays, reports, articles and presentations. Students did not have to expend large amounts of time and energy focusing on program functions and format; they already knew this at a high level. Now, time and effort was efficiently spent on activities like research, organization and critical thinking. Proficiency with technology clearly allowed for better quality academic work.

Third, Excel supports math. Whereas MS Word is a word processor, MS Excel is a numerical processor with over 300 mathematical, statistical, trigonometric, financial and logical functions. Excel has various chart, graph and diagram functions built in. Such functions became invaluable when students wished to display data visually. Also, Excel lends itself toward numerous instances of practical and theoretical mathematics and

data manipulation. When it comes to numbers, MS Excel is the industry standard. Understanding how MS Excel worked allowed for student to use data in ways that served them recently and may continue to assist them for the rest of their lives.

Fourth, the entire learning process supports systems and critical thinking. There was such a wide variety of skills developed throughout the IC3 and MOS curriculums that it forced students to look at challenges as systems thinkers and problem solvers. Whether a problem focused on hardware, ethics, data integrity, software, viruses, safety, document preparation standards, networking protocols or law, students were often trained to solve problems by working and thinking within a system. Without a doubt, these skills transferred over to History, Science, English or Health. Falls City High School produced rigorous critical thinkers and lifelong problem solvers. The IT certification program supported this process in measurable, tangible and also subtle ways (i,f,e).

Challenges

Several meaningful challenges existed within the process section of this study. The following paragraphs discuss those problems.

Apathy. A general apathy permeated many young people. This apathy manifested itself in various ways. While unemployment trends, one would think, should motivate students to work harder and make better decisions, the opposite often proved true. Students, even excellent students, often had difficulty planning for the future. High-risk individuals, however, regularly found planning an insurmountable obstacle. This lack of planning ability frequently retarded the process of learning, achievement and certification attainment. Apathy established itself as one of the greatest threats to education generally and IT certification specifically.

Competition for the same individuals continues to distract from coherence and efficiency. The need to specify was pushed down to the high school level. Majoring in a program was a choice required in the first year of high school. Students were strongly encouraged to complete three (good) or four (better) year sequential courses that map to a program major. There was something perverse in forcing young people to choose a program of studies when many of them cannot plan to the next day, much less the rest of their lives. This fact was exacerbated by an industry that suffers a 50% attrition rate for new workers within the first five years of employment (teachers). The best students, therefore, enjoyed highly coveted status by numerous programs. Such activity seemed to further the interests of districts, schools and teachers rather than students. The IT certification courses at Falls City High School contributed to and suffered from this problem.

Student Products

The previous section discussed IT certification Processes as they related to Organizations, Students and Industry.

Certification. Obtaining certification was perhaps the most quantifiable measure of student outcomes. Many students kept their eye on the prize and work hard to achieve as many certifications as they could. The previous sections discussed effort and motivation as key to certification success. Also, for a variety of reasons, students wanted to achieve their certifications to help ensure college acceptance, potential employment, challenge and increased levels of literacy. These phenomena were also discussed previously. For a few individuals, however, there was a very personal sense of achievement that manifested itself in certification attainment (o,c1,k).

Sense of achievement. There was a real sense of achievement upon certifications attainment. After taking exams, this researcher saw literally dozens of examples of student elation, jumping up and down, smiles and congratulations. Test failure, on the other hand, manifested itself in frowns, depressed body language and occasionally tears. Interestingly, however, such momentary setbacks were often quickly followed up by teacher encouragement, peer support and a swiftly set jaw of determination. Many students took two rounds of testing to pass their exams, particularly Computing Fundamentals and Excel.

Confidence. Increased levels of confidence came as a direct result of IT certification attainment. Students demonstrated such confidence by teaching or assisting other students or family members. One student says, "I have been teaching my Mom how to do all this stuff" (i,c1,b). Another student proclaimed, "My confidence is way higher than it used to be because I went into the class not knowing anything about computers and now, after I learned a lot, my confidence has grown" (i,c1,p). Still another student, Neil said, "I can use all the stuff that I am learning, Word, Excel, Database for everything in life. If I need to write something up, I can use it" (i,c1,n).

Confidence in other classes was also a product of student IT certification attainment. One student held, "In classes that I need projects in, before I had the IC3 certification class, I did not know how to do it then. But, I know how to do [it] now" (i,c1,f). Assisting teachers in other classes was also common. Kenney helped his teacher, "Well, I have a teacher that has printer problems. I can help" (i,c1,k).

Cognitive growth. The final student product discussed was cognitive grown. The IT certification curriculum helped student so become more efficient academics.

Isaac said, "I would say I have become a more efficient student" (i,c1,i). Another

student, Neil held "It makes me think things through better" (i,c1,n). Still another

student, Frank expressed his belief, "Yeah! IT training teaches you ...better ways of

doing things" (i,c1,f).

Such evidence aligned well with what industry professional said that IT training

did for certification attainees. One IT professional stated, "These skills help one work

smarter and be more efficient in every aspect of their lives" (i,ip,ks). Another IT

professional, JB stated, "I think the documentation of the Florida's DOE has supplied

regarding increased graduation rates, reduced truancies and an overall increase in GPA

was a good example of secondary benefits" (i,ip,jb).

Statistical Treatment of Pretest-Posttest Activity

The following section deals with student product in the form of pretest and

posttest scores. This section addresses RQ#1 in evaluating certification program

efficacy.

During the summer and early fall of 2011, it was FCHS's departmental policy to

pretest all incoming freshman for technical aptitude. The top half of students enjoyed

placement in the advanced freshman computer application program. This course focused

primarily on certification attainment. The lower half of students comprised non-

certification focused IT classes.

During the last month of school, all freshman students were required to take the

post-test exam which was comprise of different questions, but identical material to the

pretest. The scores from these tests, based on a 100 point metric, gave this researcher a

base from which to evaluate program effectiveness based on aggregate growth of student

groups. Results from Descriptive statistics, Levene's test, ANOVA and Post-hoc analysis

follow.

Descriptive statistics. The freshman sample ($N = 377$) was comprised of ($n =$

188) advanced IT program students and ($n = 171$) regular IT program students. A High-

risk cohort (c1) held ($n = 18$). The regular students were coded #1 obtained ($M = .167$,

$SD = .425$). The advanced program students were coded #2 and obtained ($M = .217$, SD

$= .199$) on the pretest-posttest growth calculation. The High-risk cohort was coded #3

returned ($M = .304$, $SD = .333$).

Table 8.

Descriptive statistics concerning FCHS freshman cohorts 1, 2 & 3

Change

| | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | |
					Lower Bound	Upper Bound
1	18	.304033	.2195978	.0517597	.194830	.413237
2	171	.216535	.1988864	.0152092	.186512	.246559
3	188	.166927	.4247815	.0309804	.105811	.228043
Total	377	.195975	.3331328	.0171572	.162239	.229711

Note. Cohort 1 was comprise of student group #1 ($n = 18$). Cohort 2 was comprised of student group #2 ($n = 171$). Student group #3 was made up of Cohort 3.

Levene's statistic. The Levene's statistic for testing homogeneity of variances

returned significant statistical levels $F(2,374) = 23.129, p = 0.00 < .05$. Subsequently,

these data failed to meet satisfactory compliance with homogeneity of variance and the

H_0 must be rejected. According to these data analysis, significant differences exist

between groups #1 and #2. A more thorough discussion explaining these differences will occur in Chapter Five.

ANOVA. Analysis of variance proved positive, yet failed to reach significant Results, ($p = .137 > .05$). After closer consideration, however, such results may be accounted for. Such an accounting will take place in the discussion section of Chapter Five.

Post-hoc. A Bonferroni post-hoc test illuminated the actual differences between group means. A group 1 and group 3 comparison showed the most promise of significance at $p = .286 > .05$, yet fall short of statistical significance. A full discussion of groups will take place in Chapter Five.

Industry Products

The previous section discussed student benefits of IT certification training. The following section discusses products produced from an industry standpoint.

Efficiency. There was only one real product detected by examining industry. The IT certification industry had a passion for producing more proficient students and workers.

Hiring efficiency concerns adapted to the sensitive needs of companies that hire information workers. One IT executive said:

> A non-certified applicant can only verbally (or state on a résumé) that they have the necessary skills that qualify them for a job. A certified applicant can validate those skills with certifications. (i,ip,wp)

Another IT certification professional stated, "IT certifications are the most valuable thing a job candidate or employer can use to validate and measure the level of skill that an individual possesses" (i,ip,ks). Still another Industry professional expressed, "Looking at

sites like Monster, it seems like most jobs are looking for people with proven skills with no way to gauge the skills. Certs do this" (i,ip,ws).

Schools. The relationship between IT certification and post-secondary institutions strengthened daily. One example of this phenomenon came from the University of Kentucky. Admittance to the UK School of Business required three MOS certifications. These MOS certifications mapped directly to the MOS component of FCHS's IC3 curriculum.

Institutions of quality do not want to teach remedial classes. The IT certification often enabled a student to receive college credit at best. Another possibility was that presentation of certification will option a student out of compulsory IT training. Such training would be redundant, unnecessary and expensive. At worst, schools may still not recognize the value of an IT certification and force a young co-ed to take an IT class for which they should excel; subsequently, the student should have a good chance of establishing themselves as academic leaders. As one IT executive phrased, "would lead to improved performance in other scholastic endeavors" (i,ip,lw). Industry, government, schools and students all benefit from individuals whom attain IT certifications.

Product Summary

The following section provides a summary of products obtained from IT certification training and attainment, particularly as they relate to organizations, students and industry.

Accountability

In recent years, educators witnessed an every growing trend toward educational accountability. For a variety of reasons, schools were held accountable. Two areas in

particular required investigation. First, academic accountability was nothing new to Kentucky by the time NCLB came into being. With CTE however, academic achievement often directly related to funding. Second, such funding was controlled at the district level up through the state and on to the federal funding agency. In this case, CTE funds came from Perkins.

Carl Perkins. The requirements of Carl Perkins funding required that student be career ready. The attainment of this status required an individual be a program completer of at least three years of CTE classes. The first measure was successful taking and passing of the KOSSA or KCCT exam. Another route was to be at least a three year completer and obtain industry recognized certifications (see figure 6). Failure to perform well on these measures was met with punitive reduction in Perkins discretionary funding. Such funding was extremely important to district CTE programs.

The Kentucky Department of Education. Senate Bill 1(2009) required that a student graduate being college and career ready. College ready was defined as being prepared enough to succeed in college credit bearing courses. This was demonstrated by scoring adequately on either the ACT or SAT, COMPASS, or KYOTE exams. Career ready was defined possession of the skill necessary to succeed in post-secondary education or the workforce.

Districts and subsequently schools were rated on their ability to generate such students. A point of 1.0 was given to a school that produced a college ready individual or a career ready one. A bonus, however, was given to schools that generated a college and career ready individual of 1.5 points. Such points are included in a district and school's accountability score. The state of Kentucky, along with Perkins funding elucidated they

expect schools to generate college and career ready individuals. To emphasize this position, schools and districts received rewards when they generated acceptable student outcomes and could expect punitive measures when they did not.

Career Readiness for the Modern World

While scores on tests and years of study demonstrated their easily quantifiable nature, they might not represent the total readiness picture. Other, more subtle and less easily measured aspects of readiness arose to this researcher's attention.

Confidence. The construct of confidence proved itself to be not only multiplicative, but reciprocal. Students whom obtained computer literacy skill repeatedly demonstrated that skill in core classes. As favorable reviews came from teachers and other students, increased motivation manifested itself in renewed IT certification class effort. Certifications achieved became badges of honor which garnered parental approval and peer recognition. Renewed effort led to attainment of more certifications and increased levels of digital literacy. Information Technology certification training increased student confidence in multiplicative and reciprocal ways that filtered across to many other core subjects. Success in those core classes reinforced the value-added nature of certification training and attainment.

Cognitive growth occurred as a product of IT certification training. The very nature of systems thinking, problems solving, sequential task-completion and rote memory requirements developed student cognitive abilities in ways unique to IT training. While these IT courses represented only introductory stages of IT training, they also proved quite valuable, particularly to high-risk individuals. For the first time in their lives, many students really learned the material; they could not fake it. Nor could

students charm or ingratiate their way into certifications. The psychological shift from passive learner to empowered problem solver was not proven here. This researcher detected, however, the beginnings of self actualization, pride, intellectual growth and academic efficacy unobserved in early data collection and analysis stages.

Industrial Momentum

The main product from an industry standpoint was industrial momentum. The IT industry and its subcomponent, the IT certification industry changed at a mind-numbing pace. Hardware, software, training materials, books, internet resources and general IT perspective changed so rapidly that energies exuded from the processes. While the potential for frustration manifested itself regularly with IT certification students and instructors, so too did the ability to think creatively and under pressure. Challenges coming from limited access to resources often proved themselves just the motivation stakeholders needed. The speed of the evolution of technical change grew noticeably within the scope of this program's inception to date. Industrial momentum existed in keeping educators and students energized, excited about new products and equipped (albeit slowly) with useful educational resources (i,f,k).

Workforce. Perhaps the best descriptor of the industrial products associated with IT certification training was the concept of workforce. The purpose of IT certification training, eventually, was to create a better, more efficient worker. Students would eventually become workers and should be included in an end product. On one hand, companies like Microsoft wanted all people to use their products; it was only good business sense for them to hold this position. On the other hand, training, particularly IT certification training was really designed to meet the needs of businesses. Thousands of

interviews obtained industry needs. It was industry and the need for more efficient

workers that gave birth to the IT certification movement. This movement coupled with

accountability trending within state departments of education, districts and schools.

Combined with a depressed job market and increased global competition, IT certification

training became an excellent resource to develop and prove worker skill and efficiency.

Imminent Discussion

The previous section addressed the result obtained for interpretive and statistical

methods of data collection and analysis. The CIPP framework model provided the

structure used in Chapter 4. In Chapter Five, data presentation and discussion will be

reconfigured into the format of research questions numbers RQ#1, RQ#2 and RQ#3.

CHAPTER V

DISCUSSION & CONCLUSION

This chapter contains a brief overview of study framework, structure and
methodology. Chapter five also tenders a discussion of results obtained in the previous
chapter, an interpretation of those results, and subsequent implications to stakeholders.
Major sections include Introduction, Major findings and discussion for RQ#1, RQ#2 and
RQ#3, How findings relate to literature, Interpretation, Conclusions, Implications and
Study Limitations.

Introduction

This section provides a brief summary of the major portions of this study.

Overview of the Problem

The academic, career and economic conditions that faced many American
students proved utterly dismal. High school dropout activity remained unacceptably high
for certain cultural groups and in certain markets. Due to failing American
manufacturing and heavy industry, low-skilled, highly repetitive employment grew more
elusive daily. Exacerbating an already weak job market was ineffective domestic trade
policies and increased foreign competition (Rifkin, 1995; Smith-Mello et al., 2008;
Wilson, 1996).

For High-risk individuals, the aforementioned realities created a permeating sense
of hopelessness. Such hopelessness fed a negative maelstrom in that even more risk

factors accumulated and fed off one another. The High-risk individual did not possess

the necessary support mechanisms to halt an accelerated movement toward a negative life

trajectory. Several authors called this relationship, "Risk Factors and Opportunity

Factors" (Dunst, 1993; Garbarino, 1995).

It was the job of schools to educate all American youths. Traditional programs,

however, proved completely inadequate in performing this task, particularly with High-

risk individuals. Career and Technical Education (CTE) programs, however, shone as a

bright spot in schools for decades. One particular component of CTE was Technology

Certification Programs (Barron et al., 2003; Caputo, 2003; Shore, 2008).

Previous studies suggested that Technology Certification Programs proved often

more successful in reaching and motivating High-risk individuals in that technical

training provided a tangible product via certification, skill attainment, and subsequent

employment (CompTIA, 2009). As a result, Technology Certification classes

mushroomed in schools all over America and the world. Little research, however, was

conducted exploring the efficacy, proximal, and distal effects of such training,

particularly with high school aged students. Perhaps even more interesting, this study

explored the creation of opportunity factors with High-risk students as they were

generated in the unique classroom dynamic of a Technology Certification program.

Purpose

The purpose of this study was to evaluate the instructional efficacy of one

information technology certification program, particularly with High-risk individuals.

The following section briefly reviews methods used in this study.

Review of Methodology

The following section discusses the most important methods used in this study.

Design. This study used an interpretive case study design with a quantitative component. The case study design was most appropriate because this dissertation studied a bounded system. While this research used several quantitative components, it remained essentially interpretive because this author employed mostly interpretive techniques for data collection and analysis to answer the research questions. Additional methods, including a pre-test/post-test design component, analysis of variance, and descriptive statistics allowed for data validation via triangulation and as support in answering the research questions.

Evaluation. The CIPP evaluation model proved particularly robust in instances where the situational context was relevant (Stufflebeam, 1971). Having an evaluation component contained within this study strengthens validity and generalizibility. The CIPP framework, previously discussed, provided a useful framework for guiding research. Each component --Context, Input, Process and Product—acted as its own form of evaluation. This study used a balanced evaluation CIPP framework.

Sample. This study employed a variety of sample cohorts to which appropriate data collection, analysis and interpretation methods allowed for findings. Cohort 1 was comprised of 18 9th-grade students who had all been classified as high achieving/motivated, High-risk individuals (RQ2). Cohort 2 was comprised of high achieving, mixed risk students (RQ1). Cohort 3 was comprised of all mixed motivation, mixed ability individuals (RQ1). Cohort 4 was composed of a subsample of senior

students who have taken at least two IT certification courses in their academic careers and achieved on-time graduation status (RQ3).

Data Collection. A combination of qualitative and quantitative methods collected data contained in this study. Observation and interview techniques collected data with cohorts one and four. Themes generated from initial observation informed later interviews. Patterns identified from initial interviews improved later interviews. Data analysis efforts employed a combination of inductive (ideas from literature review) and deductive (themes gleaned from initial data collection and constant comparative analysis).

Test scores, GPA, ACT, scholarship awards and certification attainment helped to augment interpretive data collection and constant comparative analysis. Descriptive statistics and Analysis of Variance added rigor and validity to this study.

Findings and Discussion for RQ#1

Are IT certification programs more efficacious than IT programs that do not offer industry certifications? (Cohorts 1,2,3)

Answer to RQ#1--Information technology courses are more efficacious than IT courses that do not offer industry certification. Four themes surfaced during this study that effectively answers RQ#1. These themes revealed themselves as: Reciprocal learning, GPA and ACT scores, Motivation, and the surprise of Teacher style efficaciousness. Data collection techniques relied on observation, interview and document inspection. Analysis methods included constant comparative and statistical analysis techniques.

264

Reciprocal Learning

Information Certification training encouraged a reciprocal form of learning across multiple content areas. For many students, skills developed in their IT certification class shifted over into other class work and class requirements. A general and specific form of comfort with technology increased student performance. Student work became better. The increased quality of work, in turn, enhanced student confidence and motivation to learn in their IT certification class. The increased motivation led to increased effort and subsequent performance. There also existed, in many classes, a sense of reciprocity (Gouldner, 1960). Students usually responded with effort to the interest and energy provided by their instructors. Such performance was measured in test scores, certification attainments, observations and student interviews. Increased student performance led to even greater student confidence.

GPA and SAT Scores

Students who possessed multiple certifications had significantly higher GPA and ACT scores (c4). The following paragraphs discuss this phenomenon.

Grade point average. A relationship between certification attainment and increased GPA existed with the (c4) cohort. Students who obtained one certification enjoyed a ($M = .1725$) GPA increase over the group of individuals who obtained 0 certifications. This relationship was not statistically significant ($p = .352 > .05$). Students who achieved 2 or more certifications, however, enjoyed a statistically significant increase of ($M = .3106$) in GPA over students who earn 0 certifications ($p = .002 < .05$). Students who obtained multiple certifications earned higher grades than those who did not.

The relationship between IT certification attainment and increased GPA was further complicated by the fact that not all students liked technology. There also existed a group of highly motivated parents who lobbied to have their children removed from certification classes because of low initial grades. According to instructors, such low grades commonly occurred at the beginning of the academic year and was part of the normal growth process. Out of the senior data set ($n = 402$), 16 individuals obtained 0 certifications while maintaining at least a 3.50 GPA.

American college testing (ACT). Students who obtained multiple certifications scored nearly three points higher on their ACT than students who obtained no certifications: 0 certifications ($M = 20.97$); 2 or more certifications ($M = 23.74$). The difference in means was 2.77 points which is statistically significant, ($p = .000 < .05$). Also, the difference between obtaining 1 certification and 2 or more certifications also achieved statistically significant status, ($p = .046 < .05$). This author made no assumptions about causality. A clear relationship, however, did exist between IT certification attainment and increased academic efficaciousness.

Not every student. With some students, particularly students who had strong support at home, the effect of reciprocal learning was not as strong. Such students, regardless of cohort, strived to achieve academically to please their parents or to pave a smoother path to college. The effect of IT certification training on such students was not as strong as for students who drew motivation from non-parental sources.

Regardless of a student's background, however, certification training was always a plus. Not one student interviewed held that training was unfruitful, a waste of time, or lacked value. Instead, however, students recognized the need for increased levels of

technical proficiency, be it for college, career or life in general. Various forms of motivation provided the fuel which drove the effort required to pass certification tests. Certification attainment provided a very visible, tangible and long lasting target for which most students consistently aimed. The next section discusses such motivations.

Motivation

Students revealed various sources of motivation during this study. Sometimes, the motivation was intrinsic, other times, extrinsic. Regardless of the source, motivation demonstrated itself a key construct to success of any student, particularly however, students required to pass rigorous, high-pressure tests.

Self motivated. Many of the students benefited from self-motivation. Regardless of cohort, students thought a great deal about life after high school. Such students often proved high achievers; many however, did not. On one hand, students frequently showed themselves disconnected from their own future, particularly freshman students. Although some students possessed a vague idea of what it means to be academically successful, many often fell short of understanding the importance of keeping good grades and taking hard classes. Such students habitually seemed to float through their courses. Many such individuals never really engaged in becoming active learners. Certification requirements proved a powerful element in waking this group up and focusing them on the methods required to achieve success.

On the other hand, many individuals came into the IT certification course knowing exactly what they wanted out of school. Although many struggled in the beginning, quick adaptation to teacher expectations typified this group. Such self-motivated individuals produced the highest grades quickly. They also produced the most

certifications; rarely did they fail to obtain personal goals. They represented rocket ships that merely used the content and the teachers as navigation. They also comprised a smaller minority of each cohort.

Motivated for increased literacy also represented a smaller minority of each cohort. Some students worked quite hard, solely to increase their levels of academic literacy. Evidence for this appeared in students who really desired increased levels of technical literacy. Also, some students recognized IT certification classes as a vehicle from which to develop themselves cognitively and as academics. These individuals became better at problem solving, critical thinking and rote memorization. Such skills proved transferable to other disciplines and seemed to be appreciated by those individuals who had developed them.

Teacher motivated. Establishing and maintaining a good relationship with their teachers reinforced an important source of motivation for many students. Such students realized that teachers responded positively to student effort and interest. Additional help, more attention and the desire to receive praise played out as powerful motivating factors for this group. Strong teacher – student relationships accounted for a portion of student success. Such a relationship building process was ongoing. Even by design, teachers often shook things up by using various motivational techniques. This researcher acknowledged such techniques as important in building individual relationships as well as developing classroom culture.

Parent-motivated. By far, the most common response associated with motivation was that students remained parent motivated. Clearly, however, a difference must be argued for passive parental motivation and active parent motivation. Students

with parents who acted passively motivational encouraged their sons and daughters to do well, study and try hard. Students with actively motivational parents also benefited from structural support. Such students had parents who actively monitored grades on a daily basis. It was also common for such parents to be proactive. Put simply, they made phone calls, wrote emails and attended open houses or parent teacher conferences. Students with such parents comprised the largest group of top achieving students regardless of cohort. Based on this finding, teacher-parent collaboration with more individuals constituted a reasonable way to drive student achievement.

Surprise

One of the most interesting findings from this study was diversity of teaching style as it related to student perceptions about content and achievement value. Three distinct teaching styles presented themselves within this study.

Teacher as a coach. Xerxes taught his class using a coaching philosophy. Students taking Xerxes' classes developed skills and then used those skills to pass certification tests, obtain certifications and compile good grades. Xerxes was very concerned with outcome based instruction as well as skill attainment. How students obtained those skills were of secondary concern. The grading scale in his class precluded good grades without passing certification exams. Xerxes did not give much homework. Also, he allowed for flexibility and diversity of learning. Students often worked in an exploratory mode. They turned to their teacher for guidance. Spoon feeding, however, was completely against Xerxes' teaching philosophy. In the beginning, there might have been some academic hand holding. Very quickly, however, students were taught how to learn what they needed to pass the exams.

To augment this flexible coaching style, Xerxes focused a great deal of time on hands-on work. Here, his coaching background took over. Xerxes demonstrated a skill and then supervised various IT activities that reinforced that skill. Such activities ranged from hardware assembly to application production. Having a hands-on approach was critical to the success of Xerxes' students. His students passed their tests at very high levels, but not always immediately. Xerxes used the shock of failure as a coaching technique to increase motivation and subsequent effort. Many of his students had never received poor grades. The only way to get good grades for Xerxes was to master the skills he taught and perform well on certification tests.

Xerxes' students had little homework. Outside of technology class and use of basic skill sets, students perceived their training as moderately valuable. They did, however, realize the importance of their certifications as a ticket to scholarships, internships, college and jobs. Much focus was placed on rote memorization, augmented with hand-on experience. While higher order thinking was of secondary concern, the coaching style of IT instruction proved highly effective.

Teacher as a manager. Two teachers, Kent and Wayne, ran their classes like a business. Project based instruction dominated these classroom. Learning objectives were sequentially ordered by objective. Such work took the form of individual projects in Kent's class. Wayne drew projects from several textbooks. Both instructors maintained approachability and consistently proved highly skilled as classroom directors. Kent was an excellent technician and highly trained in curriculum and instruction. Wayne drew extensively from a long career in business, industry, government and higher education. Student success in these classes, however, was completely up to the individual student.

270

One of the primary benefits of this instructional style was that students must followed very detailed instructions and do so sequentially. Both instructors taught the processes of being meticulous, carefully reading instructions and critical thinking. Inevitably, especially early on, students ran into problems because they did not carefully read instructions or they missed a step. In the technology world, this mattered. These instructors mastered the art of teaching students to retrace steps and solve their own mistakes.

Project work was hands-on work. For a non-verbal or kinesthetic learner, hands on work was often a joyfully comfortable way to learn. With visual learners, project work often enhanced learning. Confidence in their abilities grew quickly. Once a skill was learned, it was often then required to complete the next project and subsequently reinforced. What may be described as mastery learning, embracing the hands-on, project- based approach had primary and secondary benefits that proved cross curricular and cumulative. Neither Kent nor Wayne gave much homework, instead students stayed busy in their classes. Their teacher philosophies encouraged students to learn on their own and to earn their own way. Neither teacher spoon fed their students excessively. Instead, they promoted self-reliance and development of confidence through achievement and encouragement.

Kent taught mixed-risk classes with many high-achieving students. Wayne agreed to teach the High-risk cohort and demonstrated considerable success. Of all freshmen IT classes, Wayne's high-risk cohort of 18 students outperformed all other sections with an average post-test score increase of over 30%. While not statistically significant, ($p = .137 > .05$), it was *academically significant*, particularly with a High-risk

271

population. Cohort 2, comprised of mixed-risk, high achieving or highly motivated individuals achieved a 21.64% increase. Cohort 3, comprised of low achieving or low motivated individuals achieved a 16.69% increase. This range of achievement was unexpected. Contributing to non-statistical significance may have been the fact that cohort 1 initial pretest scores allowed for greater growth than cohort 2. Cohort 3 performed the least impressively, which suggested an answer to RQ#1. Also, the different sample sizes that comprised each cohort diminished statistical significance.

Teacher as a task-master. Bengal drove his students. Formally trained in business education and a formidable technician, Bengal encouraged learning through a combination of lecture, project based work and homework. Homework was described by students as about an hour per night. Bengal focused on practices concerned with rote memory development as well as systems and critical thinking growth. Also an excellent motivator, Bengal's students were strongly encouraged to become efficient time managers in addition to learning IT material.

Student grades tied into near daily assessments and homework that was rigorous and extensive. Students had a high learning curve initially. As they learned how to study, however, content absorption and retention became much easier. Of the four teachers, Bengal spoon fed content the most. He also, however, lectured the most.

Lectures, quickly reinforced by project work in class and homework that night, proved effective. Classroom activities included chapter disaggregation and lots of teamwork. Bengal's students indicated they were well prepared for other classes, college and the workforce. They used IT, task management, study and research skills in many of their other classes. Bengal's students, particularly previous students, valued the rigorous

training. Of the four instructors, Bengal had the highest certification pass rate, consistently. He also, however, had the highest number of parental complaints and student requests for transfer.

Common themes. There existed several themes common to all instructors. First, each teacher demonstrated exceptional skill as a student motivator. Being able to sell the value of certification was an important way to sustain student effort. Second, each instructor cared deeply about the success of their students. Students responded to their teachers' interest in their education. Third, regardless of instructional style, each instructor was successful in getting students IT certified. Next, regardless of focus, all teachers used differentiated instruction that included multiple forms of inquiry-based learning. Finally, all teachers taught beyond the scope of the content by providing the opportunity for cross curricular skill development.

Findings and Discussion for RQ#2

Are High-risk individuals more likely to achieve success in programs offering industry certification as compared to more traditional academic coursework? (Cohort 1)

Answer to RQ#2--High-risk individuals did achieve success in programs offering industry certification when compared to more traditional academic coursework. (Cohort 1) Several themes important in answering RQ#2 evolved during this study. These themes revealed themselves as: Subtle tangibility, Praise and Effort. Data collection techniques relied on observation, interview and pretest-posttest activity. Analysis methods included constant comparative and statistical analysis techniques.

Subtle Tangibility

This study maintained to goal to more fully understand the theory that IT certification training generated multiple opportunity factor with High-risk individuals; and, that achievement could be measured via increased, in-class academic performance superior to that of core classes. The evidence collected by this researcher cannot support that conclusion with High-risk students. Something else was at play here.

Evidence collected by this researcher ran contrary to theory that High-risk individuals need an immediate, tangible return on an investment of effort (Payne, 2001). Instead, High-risk individuals used the skill attained across all classes, rather than focusing only on the class that offered the most immediate, most tangible reward, certification.

Many students from the High-risk cohort, while very aware of the benefits of certification, also viewed general academic achievement on par with certification attainment. Interestingly, the use of academic achievement was forestalled for at least three years. Until applications could be made for post-secondary schooling, the GPA was not of immediate consequence. Of course, this was not true for all High-risk individuals, particularly those individuals who had strong relations with a parent figure or mentor.

The Value of Praise

Data, filtered through constant comparative analysis, suggested that High-risk individuals valued praise much more than individuals of other risk levels. In the previous paragraph, it was suggested that High-risk individual in this study looked past the need for immediate gratification. That idea, however, was obtusely stated. High-risk individuals needed immediate benefits. What diverged from accepted theory however,

was the element of tangibility. Whereas a certification and a report card were tangible documents, praise was not.

Many of the High-risk students worked especially hard to garner parent, peer and teacher praise. This form of reward was an immediate, but non-tangible benefit to IT certification training. Praise demonstrated itself particularly pronounced in classrooms where students completed certification testing. Great amounts of excitement and peer recognition surrounded certification attainment. At home, students with strong parental support also received a praise reward. The actual certification attainment, while a primary motivating factor for many self-motivated individuals, proved a secondary benefit for those students who drew motivational energy from parents, teachers and peers. Whether motivated by certification, parents, peers or teachers, such motivation directly transformed into various levels of effort and corresponding achievement.

Effort

This study theorized that the nature of IT certification attainment offered the opportunity for multiplicative generation of opportunity factors. This position was well supported by the data, however, not in the way originally theorized.

Success. There existed many aspects of success that contributed to the concept of success as it related to High-risk students. What appeared as routine achievement for low or medium-risked individuals was instead heralded as a triumph for students subjected to more risk elements. Complex, therefore, did the construct of success prove. While defining success in earlier chapter would have been easier, this author chose to allow these data to speak for themselves. In the paragraphs below, voice was given to the concept of High-risk effort.

Raising the bar was essential in achieving academic performance; yet, obstacles often barred the way. Many instructors struggled for years in adapting to this generation's general sense of entitlement. The concept of entitlement was recognized by various research authors as particularly acute in High-risk population (Moynihan, 1966; Wilson, 1996). Traditionally, High-risk individuals struggled with standards-based education. The IT certification program under review, regardless of instructor, provided the necessary structure for many High-risk individuals to escape, or at least defer, the burden of entitlement. For many students from the High-risk freshman cohort, a clear understanding of hard work and focus percolated through initial and subsequent interviews. Increased demands of focus and hard work proved fruitful in the pretest-posttest analysis.

The freshman High-risk cohort outperformed all other freshman groups in the pretest-posttest analysis. This scale measured the change, either positive or negative, for students from each of the three freshman cohorts' scores. While the tests applied to the pre-test posttest data failed to achieve statistical significance, this author argued that the high performance of cohort 1 was *academically significant*, particularly given the High-risk status.

Payoffs

The following paragraphs discuss the Proximal and Distal payoffs inherent in this study.

Proximal effort payoffs. The best way to understand proximal effort was to look at the short term benefits of IT certification training with High-risk individuals. To a person, each individual in cohort 1 articulated that they used the skills obtained in their IT

certification class to enhance the quality of work in core classes. The benefits of IT certification training, therefore, proved immediately advantageous. One may argue that such benefits may be tendered from any IT course. This position, however, was not supported by the collected data. The certification goal provided a target and increased incentive to learn the material in the first place and therefore proved an added benefit, unavailable in traditional IT courses. High-risk individuals benefited from the certification feature in a way that immediately enhanced confidence and performance. This phenomenon was supported by the literature that held the position that High-risk individuals respond better to immediate results (Payne, 2001). Findings diverge from such literature in that there were long term benefits as well.

Distal effort payoff. The High-risk cohort was acutely aware of the distal benefits of IT certification attainment. To a person, individuals from Cohort 1 demonstrated a surprisingly sophisticated understanding of how certification training and attainment will help them in the future. These students bought into the belief that hard work now, will pay off big in the future. Cohort 1 students demonstrated awareness about certification attainment as a benefit for college entry. They also understood the added value employers often placed on certification attainment. Many of the students interviewed mentioned using certification attainment to enhance their résumés. Such forward thinking was atypical for High-risk populations (Payne, 2001; Wilson, 1995). The answer may lie in the work of Rumberger and Palardy (1995) who suggested that school wide SES provided exactly the type of opportunity for High-risk individuals detected in this study.

Findings and Discussion for RQ#3

Are IT certified individuals more likely to experience post-secondary success than non-certified individuals? (Cohort 4)

Answer to RQ#3--Individuals who held multiple IT certifications demonstrated themselves more likely to achieve post-secondary success than individuals holding 0 or 1 certification. Several themes, important in answering RQ#3, surfaced and fleshed out during this study. These themes revealed themselves as: Academic growth, Employability and Funding. Data collection techniques relied on document inspection, focus group and interview. Analysis included constant comparative and statistical techniques.

Academic Growth

Depending on the students' instructor, various levels of academic growth manifested in Cohort 4. There was also a relationship directly associated with student sources of motivation. While not as strong as initially theorized, a clearly identifiable academic effect was detected by this author. Several students who participated in the focus group activity elucidated the importance of the IT certification training on their subsequent academic growth. Later interviews confirmed this position.

Academic success. The following paragraphs discussed the three academic themes that emerged from this study, particularly as they related to RQ#3.

Time and project management requirements often encouraged student to change existing academic habits. Time and project management activity manifested itself in three forms. First, classes that had rigorous homework requirements forced students to manage their time in order to complete nightly work. Extra and co-curricular activities often limited the study time available to students and work was often not completed.

Failing grades quickly drew attention from active and passively supportive parents. Student options now required they either drop extra activities or reexamine time drains. Students who chose to remain in extra or co-curricular activities found that they could find blocks of time they did not earlier realize existed. Quite often, such students adapted to find time, either in school or at home, in which they could complete their coursework. They became more efficient users of time.

Second, students who did not have extensive homework often received extensive project work in class. A similar situation developed where students' time choices began to matter. Project work, often combined with lecture, frequently moved at a pace that forced students to make better in-class time use choices. Students of instructors who used this model became better project and task managers or their grades too began to fail. Subsequent failure often drew advice, threats, punishments or encouragement from supportive parents. Students in this classroom model also adapted.

Third, for many parents, taking students out of extra or co-curricular activity was unthinkable. Often too, was the case, student schedules would be completely full of nightly and weekend activities. Such students, to an individual, struggled initially. Many parents of such individuals, consequently lobbied FCHS's counseling department to have their child moved to a less rigorous curriculum of IT training. Such courses did not focus on certification attainment and often moved at a much reduced pace. The various instructors interviewed for this study believe such students accounted for up to 50% of all freshmen IT transfer requests. Such students, therefore, experienced only a fraction of the benefits available to the IT certification program completer.

Problem solving and critical thinking skills developed regardless of instructor style or student support. Evidence for problem solving and critical thinking development was found in focus group discussion and later interviews. Statistical confirmation in superior ACT scores reinforced this conclusion. While some students used the method of questions memorization, this technique, according to the psychometricians who developed the certification exams, was not efficient. Instead, many students indicated they learned how to take high-stakes exams. Techniques, included discerning families of questions and questions disaggregation, repeatedly demonstrated their value to students. Most of the students interviewed indicated they benefited, to various degrees, from the cyclical and high-stakes nature of IT certification test preparation.

Academic self-efficacy demonstrated itself enhanced, regardless of teacher style. Although different teaching styles developed different forms of academic self-efficacy, the phenomenon was evident at the programic level. Two forms of academic self-efficacy revealed themselves in this study. First, *Stressful challenge* was indicated as an element supporting academic self-efficacy. Nearly to a student, IT certification participants enjoyed the stressful challenge of taking rigorous IT certification exams. Students understood that passing the exam held value far and above an academic grade. Students also knew that they could not fake the knowledge required to pass such exams. Clear evidence of this knowledge saturates the data obtained in this study. Students enjoyed the challenge and generally reveled in certification attainment. Those who failed to achieve certifications often redoubled their preparation effort and passed upon subsequent retesting.

Second, the element of Teamwork was not evenly distributed across the program. While some instructors placed the onus of responsibility solely at the door of each individual student, other instructors encouraged a teamwork approach. Clearly, both models had their advantages. This researcher held neither approach superior, but instead, valued the context from which each model was used and ultimately, achieved results.

Academic reciprocity was evidenced across the program. This phenomenon too manifested itself in different forms. Students in each model took from something or someone, knowledge, clarity, motivation or energy. They each, in turn, passed back some form of effort to their instructor, classmate or partners. Even if the students only worked in their own self-interest, success was always acknowledged and shared, to some degree, by the entire class and the instructor. Clear evidence of trust and inter-dependence permeated this study. Students all took from the program and they, to an individual, also gave back.

Employability

One form of success was defined as students obtaining the ability to secure and retain gainful employment. The Carl Perkins organization and the Kentucky Department of Education adopted versions of this definition. Students who obtained IT certification demonstrated themselves more employable that students who did not. Whether true or not, multiple participants believed the reason they obtained their current job was because they distinguished themselves technically and academically proficient via IT certification. This study also defined success in terms of dollars and cents; that being the case, not only did students benefit from enhanced employment opportunities, but also from scholarship dollars awarded.

281

Funding

The paragraph below discusses the various financial advantages of certification attainment.

Financial success. Students who achieved 2 or more certification enjoyed a statistically significant increase of college scholarship awards than individuals who earned 0 certifications. In fact, multiple certification holders won over twice as much college funding as those with zero certifications. Not only was this figure statistically significant, this researcher put forth that the IT certification phenomenon under review was *financially significant* as well. One of the greatest barriers to successful post-secondary matriculation was cost (Brautsch, 2010). Based upon these data and subsequent analysis, obtaining multiple IT certifications helped offset some of the cost of higher education. So too, therefore, did the ability to obtain and keep employment (Flint, 1997).

How findings relate to the Literature

The following section discusses how finding relate and diverge from relevant research literature.

In Alignment With Reviewed Research Literature

First, findings confirm that IT certification training and attainment created multiplicative and reciprocal generation of opportunity factors (Dubow & Luster, 1990; Garbarino, 1995; Rae-Grant, Thomas, Offord, & Boyle, 1989; Sameroff et al., 1987; Werner, 1985). The researchers above did not use the language of "reciprocal" or "multiplicative." They did, however, allude or hint at such phenomenon. These findings, therefore, suggested a confirmatory status.

Second, the need for immediate results by High-risk populations was also confirmed and therefore in alignment with several researchers of poverty or High-risk literature (Garbarino, 1995; Payne, 2001; Rifkin, 1995; Wilson, 1996). Such High-risk individuals required immediate and constant feedback. High levels of motivation demonstrated itself closely linked to high levels of effort. Such feedback took many forms and came from various sources. Unexpected findings related to feedback, however, were detected in the form of interpretive constructs and will be addressed in the following section.

Third, academic expectations aligned with IT certification attainment proved to be planted on solid ground. The research surrounding IT certification attainment suggested finding that individuals who obtain IT certification become better students in very specific ways (Kay & Honey, 2005). Outside the scope of this study, however, such specific measurements eluded this researcher. Instead, however, academic indicators like ACT scores, GPA and scholarship dollars awarded proved enhanced by multiple certification attainments.

Interpretive constructs. Subtle constructs elucidated themselves during this study. Academic confidence and therefore academic self-efficacy demonstrated themselves enhanced by IT certification training (Adelman, 2000; CompTIA, 2009; Shore, 2008). Students consistently revealed a sense of accomplishment in that they could perform new tasks as well as obtain IT certifications. For young, often High-risk individuals, the sense of personal empowerment grew as new skills developed. Enhancing that initial sense of achievement, certification attainment garnered parent,

teacher and peer recognition and acted as a reinforcing tonic that renewed motivation and subsequent effort.

Industry Expectations. Interestingly, industry perspectives closely aligned with research findings. The industry literature reviewed and augmented by numerous interviews held that individuals who obtained certifications expected to use such certification in various ways to enhance their lives (Adelman, 2000; CompTIA, 2009; Kay & Honey, 2005; Shore, 2008). Enhanced status with employment, experience attainment, college credit and general life efficacy all contributed to industry perspective. These anticipations proved well founded by the results obtained in this study.

In Divergence From Reviewed Research Literature.

First, the research literature reviewed by this author was silent on the effects of teacher style on certification attainment and classroom efficacy. A vast amount of research, however, has been conducted on teacher style as it pertained to more traditional curriculums (Grasha, 1994; Klaveren, 2010; Reinsmith, 1994; Silberman, 2003). It was a surprise, then, that this researcher was confronted with finding that supported the use of various teaching techniques and subsequent effectiveness. Moreover, this finding was complicated with recognition of different risk levels inherent with students.

Second, it was well established that IT certification training and attainment held benefits for students in core classes (Adelman, 2000; CompTIA, 2009; Kay & Honey, 2005; Shore, 2008). It was, however, unexpected to discover the reciprocal nature of IT training and certification success. The research literature reviewed by this author was silent on this phenomenon. Closely related, but outside the scope of the IT certification discipline, was the idea of Reciprocity (Gouldner, 1960). Also peripheral to the studied

phenomenon was Social Exchange Theory (Lawler, 2001). Both these researchers explored these theories as they pertain to individuals and even group settings. Virtually silent, however, were they on the concept of cross-curricular reciprocity or cross-curricular academic exchange.

Third, financial success in obtaining IT certifications garnered from program training was generally covered in the research literature pertaining to certification (Adelman, 2000; CompTIA, 2009; Kay & Honey, 2005; Shore, 2008). In very broad strokes, researchers discussed opting out of college classes or obtain college credit. Authors also discussed résumé enhancement and internship attainment. Some researchers even discussed IT certification as a prerequisite to certain program entrance. All research reviewed by this author, however, was silent on the *financially significant* benefits of certification attainment in forms of enhanced GPA, ACT scores and then scholarship dollars obtained. Due to the exploratory nature of this study, this author could find no study with similar findings related to *financial significance*.

Finally, this study elucidated the phenomenon of enhanced test-taking capacity. While reviewed authors fully cover the range of IT certification testing, they remained silent on the concept of test-taking as a skill (Adelman, 2000; CompTIA, 2009; Kay & Honey, 2005; Shore, 2008). Data obtained in this study indicated the high-stakes, high-pressure nature of IT certification testing contributed to general test taking skill. Such skill manifested into greater comfort and capacity in accountability testing in other areas. The concept of Adaptive-literacy, posited by Kay and Honey, could be viewed as a distant cousin to the phenomenon detected in this study (2000).

Interpretation Model

The following section of interpretation was heavily influenced from the work

Transforming Qualitative Data (Wolcott, 1994, p. 43). This author will attempt to

interpret these findings by linking back to theory.

Competing Systems

The data contained within this study suggest that many, but not all, individuals

acknowledge the added value of certification attainment. All individuals in this study,

however, possessed an awareness of additional benefits that certification attainment

tendered. It was interesting, however, to see patterns emerge garnered from data that

many of the participants themselves seemed unaware. To illustrate this point, very few of

the individuals demonstrated an awareness of adaptive level of literacy they had obtained.

To a person, however, participants conceded that knowledge of technology would be

required of them regardless of the rapid changes in emerging technology and regardless

of their chosen career field. Also, to a person, participants believed they obtained the

necessary skills to adapt to the technological needs of the future. For these individuals,

the academic tradeoff seemed to have worked to their benefit.

With a wealth of activities to which participants could have applied effort, student

chose to succeed in IT certification because they, also to an individual, recognized the

added value of such training. Regardless of the program, individuals gravitated toward

activities that provide the most benefit at the least expense. The IT certification program

at FCHS appears to have provided this for many individuals.

286

Social Toxicity

The IT certification program in this study provided several insulating opportunity factors unique to its environment. First, the sense of accomplishment in obtaining an internationally recognized, IT certification was an achievement of significance for most individuals. Obtaining many certifications compounded the sense of achievement. Many students expressed greater value in certification over traditional course grades. This position was strongly confirmed by industry.

Confidence, born of success attained from skill and effort clearly transferred over into life's other areas. Such areas included, but were not limited to academic achievement in other classes, internship and jobs obtained, increased GPA and ACT scores, leadership status and scholarship dollars awarded. Enhanced status was compounded by the fact that not everyone achieved certified status. Rewards for certification acted as a further form of opportunity factor that included some combination of parent, teacher or peer recognition, school wide recognition and first choice for advanced IT program selection in subsequent academic years.

Social and Academic Exchange

Most participants, but not all, confirmed a deep sense of reliance on themselves, their instructors or classmates. These data and analysis support the position of academic self-efficacy as well as social exchange. Teacher style predetermined much in this area. It was clear, however, that cognitive growth and independence occurred in some classroom models whereas team and partner reliance developed in other models. It was beyond the scope of this study to determine which model was most effective. Clearly,

however, the skills of independence and inter-dependence will serve students well in their post-secondary careers.

Conclusions

The previous sections discussed an interpretation of findings from a theoretical perspective. The following section discusses conclusions as they relate to the research questions.

Performance

The IT certification program at FCHS clearly outperformed programs that did not focus on certification attainment. The measurement used to support this conclusion was the pretest-posttest model and graduating senior statistics. Value-added benefits contributed to student motivation that led to increased levels of effort. Students who participated in IT certification programs and achieved multiple certifications had better résumé's, had higher ACT scores, had higher GPA's and as a group, earned over twice the scholarship dollars. Such students are more likely to achieve post-secondary success.

A caveat should be noted here that although a clear relationship between program participation and student efficacy existed, the nature of that relationship has yet to be fully understood. One possible explanation was that due to FCHS's IT focus, smarter students take more IT certification classes. If this was the case, the program effect would be minimal. Interpretive data collection and analysis, however, supported the proposition that there was a strong program effect. To ascertain a causal relationship, however, further study is required.

High-risk and Certification

High-risk individuals are not more likely to obtain success in IT certification classes than in Core classes. The reciprocal nature of learning enhanced student skill levels across the board. Such skill was then applied to core class work and projects. The success in Core classes increased levels of motivation and subsequent effort in their IT certification class. Discovery of this phenomenon, with this population was a surprise. This author coined the phenomenon as "Synergenic-Reciprocity." With High-risk individuals, peer recognition, parental and teacher praise proved more significant than with mixed-risk populations. Individuals who obtained multiple certifications proved more likely to achieve post-secondary success than individuals who did not obtain certification. Several indicators pointed to enhanced post-secondary success likelihood.

Academic Metrics. Individuals who obtain multiple IT certifications demonstrated a greater academic aptitude than individuals who achieved 1 or 0 certifications. This aptitude demonstrated itself via better GPA and ACT scores. Various schools and organizations use such metrics to inform all kinds of admittance, enrollment and personnel decisions. Individuals with high academic scores consistently obtained acceptance into better schools and receive more desirable employment offers.

Cognitive Benefits. Individuals who obtained IT certification training proved to be better time and project managers. Also, students who obtained certification demonstrated superior test taking abilities over those who did not. This researcher argued that the nature of the certification program encouraged cognitive growth and test taking skill. Such skills, it was theorized, transferred into superior tests taking performance in other classes and on state and national assessments.

Financial Metrics. Individuals who obtain multiple IT certifications received more than twice the scholarship dollars awarded over individuals who obtained zero certifications. Such financial benefits contributed to the success of certification attainees while eluding those individuals who did not obtain such IT certifications. Several students interviewed also gained employment, due to what they believed flowed from the benefits of certification attainment.

Implications

The previous section discussed the conclusions of this study. The following section will discuss the implications of those conclusions.

Researchers

Individuals concerned with academic research may find this study useful. While a link has been established connecting IT certification training and enhanced academic performance, more research is required to fully understand this phenomenon. This researcher makes no claim to "silver bullet status" in closing the achievement gap between the haves and the have-nots. The results of this study, however, are promising. Such programs may provide fertile ground for further research, particularly with High-risk populations.

Further research. It is determined by this study that a clear link exists between teacher style and student achievement. Which teaching styles, however, work best with which populations? While outside the scope of this study, this interesting question has been breached and requires further exploration.

Policy Makers

Education policy is cyclical and ever-changing. As student demographics and culture continue to change, so too are the demands of policy makers to craft more intelligent education policy. This study provides fodder for policy makers to help close achievement gaps and improve struggling schools. It is also true that such programs are expensive. Many individuals associated with the Kentucky Department of Education and Carl Perkins funding may be able to use the results of this study to help craft implementation policies as well as funding formulas.

Economy. Findings contained within this study suggest IT certification programs offer attainees a way to earn a living. Large, multinational companies may therefore draw from a domestic pool of applicants rather than have to recruit IT talent from abroad. Much of the reasoning behind industrial flight was blamed on an ill-prepared workforce. The results obtained in this study suggest that the domestic workforce, as it relates to IT capacities, is improving. It therefore follows that if policy makers desire a more sound economy via citizenship of large companies, funding and proliferation of IT certification programs makes good financial sense.

Accountability. We live and work in an age of ever growing accountability, particularly with education. States and districts literally scramble to find methods in which to raise aggregate test scores. This author posits the exceedingly rigorous testing schedule of the IT certification program under review enhances students' ability to successfully navigate those very tests. If one could ignore the cognitive benefits of such training and just focus on, "testing literacy" that alone may make a dramatic change in aggregate scores. Certainly, evidence to support such activity exists within this study.

More research on this topic should, however, prove more fruitful.

A caveat to policy makers is that IT programs are expensive. Many educational leaders see CTE in general and IT programs specifically, as an expense waste of resources. If, however, such programs are used to their full effect, preliminary results suggest the benefits far outstrip most (or all) other programs in positive affect to student growth and subsequent achievement.

Practitioners

The implications of this research for practitioners take two forms. First, it may be tempting to try to mimic one of the teacher styles discussed in this work. This author suggests, however, that practitioners develop their own style that fits within the framework of their own abilities and context. What may work with one personality type is often catastrophic when replication is attempted. School contexts too are vastly different. So too are student populations different. Instead, this study, in regard to practitioners suggests trying various methods with various populations. Also, adhering to time-tested pedagogical techniques usually produces better results. Initial attempts of Xerxes, Bengal and Kent all suffer from a high learning curve. Eventually, however, they each figured out how to motivate, motivate, motivate as the essential key that ran concurrent through each classroom.

Second, the effect of parental influence on students is surprisingly strong. The implication of this finding suggests that close teacher-parent communication encourages better performance, particularly in the early period. Educating the parents, therefore, is often of equal consequence as educating students. With parents, teachers and students working in coherence, program and individual successes are more likely.

Study Limitations

The previous section discussed implications to Researchers, Policy Makers and Practitioners. The final section of this dissertation discusses study limitations as they relate to study credibility.

Sampling Decisions

Purposive sampling methods allowed for clear delineation between cohorts. This is true, particularly for the control group cohort (c3) which was comprised of low motivation, low achieving students. The treatments groups of (c1 & c2) allowed for the detection of program phenomenon. The High-risk individuals in this study comprised at least a portion of each cohort. Cohort one, however, was comprised individuals of High-risk status only. While detection of High-risk status was purposive, assignment to Cohort one was random. School counselors assigned students to classes based solely on risk status and scheduling requirements.

The senior cohort (c4) provided individuals for focus group activities and interviews. Individuals who contributed to this activity did so based upon availability. This researcher desired to attain purposive sample diversity based upon participants previous instructors. Such diversity proved fruitful. All such participants worked as teachers' aides and therefore missed no instruction or school activities by participating in this study. Access to students proved a formidable barrier throughout this study.

Variance in inter-cohort groupings occasionally violated assumptions of ANOVA. In itself, not catastrophic, but when combined with other failed assumptions like normal distribution, or homogeneity of variance, the practical use of comparison of means became limited.

293

Validity

Several validity concerns, some predicted and some a surprise, arose during the course of this study. The following section discusses some of those concerns.

Internal Validity. Two potential internal validity concerns emerged throughout this study. First, Attrition was expected at the onset of this study. The extent of that attrition, however, was not expected. Over sixty students in the freshman class failed to complete the academic year at FCHS. A wide range of reasons contributed to student transfer. Also, almost one third of the senior class was lost over the four year process to graduation. It would be interesting to attain data from such individuals. A survival analysis study may be useful at some point in the future.

Second, experimenter expectation error may have contaminated data. This researcher was seen almost every day by study participants. While not in direct supervision of any individual who was interviewed, researcher presence may have affected data integrity. Put simply, research questions may have leaked out to multiple, particularly, cohort 1 participants. No evidence of this contamination was detected, but the possibility certainly existed.

Triangulation. Interpretive data collection and analysis suggests a strong program effect with some individuals. With others, however, the effect is not as pronounced. Clearly, multiple variables or constructs contribute to the strength of the program treatment. Individuals, particularly the young participants of this study, sometimes struggled with comprehension or articulation during the data collection period. The use of scaffolded questions, often revised, allowed for detection of phenomenon. Use of "Thick Description" helped in providing transparency and validity

(Geertz, 1973). Statistical data collection and analysis often proved confirmatory. Taken together, use of multiple methods provides a platform for creating sound conclusions. That being the case, it would be remiss to ignore limitations.

The Absurdity of Validity. The concept that interpretive research can ever, "get the study right" stretches credibility (Wolcott, 1994, pp. 364-369). Circumstances vary by study. Little or no guidance is available to whether or not the researcher got any part of the conclusions or interpretation "correct." Personal bias, acknowledged and somewhat controlled for, can never be completely removed (Creswell, 2005, p. 274; Rossman & Rallis, 2003, pp. 35-36). This author is aware of the influence of bias in this work if for no other reason than because it is interesting to him. The interpretive data collected from participants in this study were personal and often charged with emotion. Results vary by individuals and by degrees. This author believes, however, a true representation of phenomenon was detected at the school, classroom and individual levels.

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