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A comparative study on the efficacy of High Schools That Work in vocational high schools in Massachusetts.

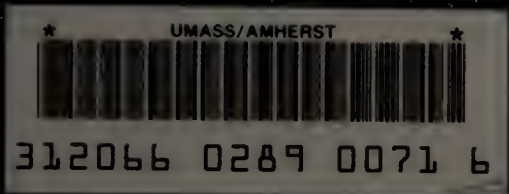
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A COMPARATIVE STUDY ON THE EFFICACY OF HIGH SCHOOLS THAT
WORK IN VOCATIONAL HIGH SCHOOLS IN MASSACHUSETTS

A Dissertation Presented

by

JOHN A. KOZIKOWSKI

Submitted to the Graduate School of the
University of Massachusetts Amherst in partial fulfillment
Of the requirements for the degree of

DOCTOR OF EDUCATION

May 2004

Education

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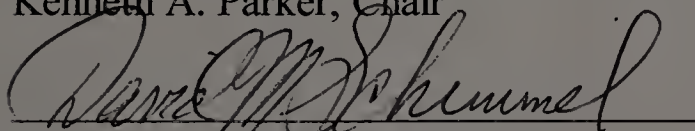
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Dedication

To my patient and loving wife, Lois.

ACKNOWLEDGEMENTS

I would like to thank my chair, Kenneth Parker for providing me with the guidance necessary to bring this endeavor to fruition. Without his patience and understanding, I would never have made it through the tough times. I would also like to extend my deepest gratitude to my committee members David Schimmel and Thomas Kida for their encouragement and support throughout this process.

I would also like to thank William Thummel who served as both an inspiration and mentor for so many years.

ABSTRACT

A COMPARATIVE STUDY ON THE EFFICACY OF HIGH SCHOOLS THAT WORK IN VOCATIONAL HIGH SCHOOLS IN MASSACHUSETTS

MAY 2004

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Research shows us that there is a need for high-stakes testing, assessment, and increased standards in secondary public schools in Massachusetts. The purpose of this study was to review successful models for school reform with a focus on the efficacy of the High Schools That Work model in vocational-technical high schools in Massachusetts. This study compared and analyzed the results of learner outcomes in Massachusetts vocational-technical high schools by using the results in the Failing category from the Massachusetts Comprehensive Assessment System, which is a high-stakes test based on increased standards (The Massachusetts Frameworks). The study compared an equal number of Massachusetts vocational-technical high schools that are members of the High Schools That Work network with an equal number of those that are nonmembers. The study compared the Massachusetts Comprehensive Assessment System Failing category results in English Language Arts and Mathematics from 1999, 2000, 2001, and 2002 between High Schools That Work vocational-technical high schools in Massachusetts and non-High Schools That Work vocational-technical high schools in Massachusetts. Students not in the Failing category for English Language Arts and Mathematics would be

eligible to receive a high school diploma, while those students in the Failing categories would not be eligible to receive diplomas. The study also compared dropout rates between 1999, 2000, and 2001 to learn if increased standards and high-stakes testing have led to a significant increase in the dropout rate in High Schools That Work vocational-technical high schools in Massachusetts when compared to dropout rates in non-High Schools That Work vocational-technical high schools in Massachusetts.

Using the STATA statistical software package, this study found significant differences in the failure rates for students in the English Language Arts and Mathematics Massachusetts Comprehensive Assessment System for non-High Schools That Work vocational-technical high schools in Massachusetts when compared to the failure rates for students in the English Language Arts and Mathematics Massachusetts Comprehensive Assessment System for High Schools That Work vocational-technical high schools in Massachusetts. Based on these results, this study has concluded that implementing the High Schools That Work model in Massachusetts vocational-technical high schools has done some significant good in effectively increasing learner outcomes on high-standards, high-stakes testing.

TABLE OF CONTENTS

	<u>Page</u>
ACKNOWLEDGEMENTS.....	v
ABSTRACT.....	vi
LIST OF TABLES.....	x
CHAPTER	
1. THE PROBLEM.....	1
Introduction.....	1
Background of the Problem.....	1
Importance of the Study.....	2
Purpose of the Study.....	6
Research Question.....	7
Significance of the Study.....	7
Definition of Terms.....	8
An Historical Perspective: The Integration of Academic and Vocational-technical Education.....	10
2. REVIEW OF THE LITERATURE.....	27
Leadership Models.....	27
Taylor Model.....	29
Deming Model.....	31
Curricula and Pedagogy.....	31
Standards –based Reform.....	39
An Overview: Whole School Models for Integration of Academic and Vocational-technical Education in the United States.....	41
High Schools That Work.....	48
Tech Prep.....	51
Career Academies.....	55
Youth Apprenticeships.....	57
Cooperative Education.....	57
3. DESIGN AND METHODOLOGY.....	59
Research Question.....	59

4. FINDINGS OF THE RESEARCH.....	65
5. CONCLUSIONS AND RECOMMENDATIONS.....	72
Purpose and Rationale for this Study.....	72
Methodology.....	73
Findings.....	74
Response to Research Questions.....	75
Conclusions.....	76
Implications for Further Research.....	76
Recommendations.....	77
APPENDICES	
A. A LIST OF HIGH SCHOOLS THAT WORK VOCATIONAL HIGH SCHOOLS.....	78
B. A LIST OF NON-HIGH SCHOOLS THAT WORK VOCATIONAL HIGH SCHOOLS.....	79
REFERENCES.....	80

LIST OF TABLES

Table	Page
1. High Schools That Work Dropout Rates.....	68
2. Non-High Schools That Work Dropout Rates.....	69
3. High Schools That Work MCAS Scores.....	70
4. Non-High Schools That Work MCAS Scores.....	71

CHAPTER 1

THE PROBLEM

Introduction

This researcher examined and compared the efficacy of the High Schools That Work reform model on learner outcomes in Massachusetts vocational-technical schools by comparing student results in the Failing category on the Massachusetts Comprehensive Assessment System in English Language Arts and Mathematics in 1999, 2000, 2001, and 2002 for 15 High Schools That Work vocational high schools with student results on the Massachusetts Comprehensive Assessment System in English Language Arts and Mathematics in 1999, 2000, 2001, and 2002 for 15 randomly selected non-member High Schools That Work vocational-technical high schools in Massachusetts.

This researcher also examined and compared the efficacy of the High Schools That Work model on the dropout rates for 1999, 2000, and 2001 in 15 High Schools That Work vocational high schools in Massachusetts with the dropout rates for 1999, 2000, and 2001 in 15 randomly selected non-member High Schools That Work vocational-technical high schools in Massachusetts.

Background of the Problem

The evolution of both public academic education, and vocational education in the United States was traced by reviewing four distinct periods in American public education: the Colonial Period, the Jeffersonian Period, the time of Horace Mann, and the 1940s to the present. While the Colonial, Jeffersonian, and Mann periods provide a foundational understanding of public education, the 1940s to the present demonstrates the

increasing urgency for the integration of academic and vocational-technical education. It is also from the 1940s through the present when most significant change occurred in terms of our historically immediate future. The most visibly dramatic changes begin to occur with the passage of the Carl D. Perkins Vocational Act of 1984, the Carl D. Perkins Vocational and Applied Technology Act of 1990, the Carl D. Perkins Vocational-Technical Education Act of 1998 and the Secretary's Commission on Achieving Necessary Skills. These changes have led to various models for integrating academic and vocational-technical education including, but not limited to, High Schools That Work, Academies, Tech Prep, Cooperative Education, Youth Apprenticeships, and School-to-Work. This paper also addresses two of the most historically influential philosophies in public education, the philosophies of John Dewey and Charles Prosser.

Importance of the Study

Today, we have come to realize that because of economic necessity fueled by technological advances and a globalization of the economy, we have entered an era of life-long education. Life-long education can, perhaps, best be defined as a hybrid of formal education: "the highly institutionalized, chronologically graded and hierarchically structured 'education system,' spanning lower primary school and the upper reaches of the university" (Coombs and Ahmed, 1974, p. 8); informal education: "The lifelong process by which every person acquires and accumulates knowledge, skills, attitudes and insights from daily experiences and exposure to the environment" (Coombs and Ahmed, 1974, p. 8); and informal education: "Any organized, systematic, educational activity carried on outside the framework of the formal system to provide selected types of learning to particular subgroups in the population, adults as well as children" (Coombs

and Ahmed, 1974, p. 8).

The United States economic system during the 1950s, 1960s, 1970s, and 1980s, operated on principles introduced by Henry Ford in 1914 and Frederick Taylor in 1911. This era of “Fordism” involved an assembly-line mass production of goods with the breakdown of the labor processes into detailed component motions and organized these component motions through detailed time-and-motion studies. Large numbers of semi-skilled workers were needed by such a system (Venkatesh, 1999, pp.111-12).

The late twentieth century brought the United States and other major industrial nations into a globally competitive marketplace with a radically changed industrial paradigm. Not only has the globe become the marketplace, but it has also become the production space. To survive, industry has had to adapt to the theories of flexible production and specialization because of unstable markets and rapidly emerging new markets. Work has become decentralized, outsourced, and knowledge-based. The workforce in such an economy needs a knowledge base more so than a mechanical base. (Venkatesh, 1999, pp.11-13).

The majority of today’s workforce needs the ability to think critically, work cooperatively, and possess advanced academic and vocational-technical skills. Today’s workforce needs to be committed to the concept of life-long learning. Rapid technological advances, along with a globalization of the economy, have produced a need for reform and change in the public school system.

There is a need for integrating high standards, core academic and vocational-technical education along with career awareness. Integration is defined as the process by which academic and vocational staffs work together so that curriculum is both rigorous

and relevant (Finch and Crunkilton, 1999, pp. 263-269). There is also a need to measure accountability within the public school system not only because federal funds are involved and can be denied under provisions of the Civil Rights Act of 1964, Title IX, Americans With Disabilities Act of 1990, the Equal Education Opportunities Act, and the Rehabilitation Act of 1973, but also because it is in the best interests of the students. (Alexander & Alexander, 1992, pp.845-856)

Massachusetts first joined the High Schools That Work network in 1995 and awarded individual grants of \$20,000.00 per year for 5 years plus \$18,000.00 individual site membership fees for the following vocational-technical high schools: Blackstone Valley Regional Vocational Technical High School, Greater New Bedford Regional Vocational Technical High School, Minuteman Science and Technology High School, North High School, Putnam Vocational Technical High School, Quincy High School/Center for Technical Education, Salem High School, Taconic High School, Tri-County Regional Vocational Technical High School, and Westport Academy High School. The Massachusetts Department of Education added the following sites with identical grants in 1998: Chicopee Comprehensive High School, Norfolk County Agricultural High School, Pittsfield High School, Silver Lake Regional High School, Somerset High School, Upper Cape Regional Vocational Technical High School, Worcester Vocational High School, Dean Technical High School, Northampton-Smith Vocational Agricultural School, and Greater Lawrence Regional Vocational Technical High School. The followings sites were added at identical costs in 2000: Assabet Valley Regional Vocational Technical High School, Attleboro High School, Bristol-Plymouth Regional Vocational Technical High School, South Shore Regional Vocational Technical High School, and North Shore

Regional Vocational Technical High School. Massachusetts added the following sites at identical costs in 2002: Westfield Vocational High School, Montachusett Regional Vocational Technical High School, and Southeastern Regional Vocational Technical High School.

Massachusetts has made a substantial investment of approximately \$3,118,000.00 in the High Schools That Work initiative.

There are approximately 96 vocational-technical high schools in the Commonwealth of Massachusetts. Thirty-one of these high schools are current members of the High Schools That Work network with 10 sites having been members since 1995; 10 sites having been members since 1998; 5 sites having been members since 2000; 3 sites having been members since 2001; 3 sites having been members since 2002. This study looks at the efficacy of High Schools That Work model in vocational-technical high schools in Massachusetts by comparing results on the Massachusetts Comprehensive Assessment System for school years 1999-2000, 2000-2001, and 2001-2002. It also compares and analyzes similar year data using student retention rates as an additional indicator of success. The study also compares and analyzes the data from 15 of the earliest Massachusetts High Schools That Work sites with an equal number of Massachusetts nonmember sites selected at random.

Conclusions drawn from this study should answer the question of the efficacy of the High Schools That Work initiative on learner outcomes in the Massachusetts vocational-technical schools as measured by student scores on the Massachusetts Comprehensive Assessment System in English Language Arts and Mathematics and by a comparison of the dropout rates for the High Schools That Work sites with the dropout

rates for the nonmember High Schools That Work vocational-technical schools. The results will be shared by disseminating the study to the Southern Regional Education Board and the Massachusetts Department of Education: School to Career cluster.

A caution to the study would be a heightened awareness of the data from the 1999-2000 Massachusetts Comprehensive Assessment System results because the diploma requirement for passage of the assessment begins with the Massachusetts graduating classes of 2003.

Purpose of the study

The purpose of this study was to compare the efficacy of the High Schools That Work school reform model on learner outcomes as measured by the student results on the Massachusetts Comprehensive Assessment System in English Language Arts and Mathematics for 15 High Schools That Work vocational-technical high schools in Massachusetts with student results on the Massachusetts Comprehensive Assessment System in English Language Arts and Mathematics for 15 nonmember High Schools That Work vocational-technical high schools in Massachusetts for the years 1999, 2000, 2001, and 2002. The purpose was also to compare the efficacy of the High Schools That Work school reform model on student dropout rates by comparing the dropout rates for the 15 High Schools That Work vocational-technical high schools in Massachusetts with the dropout rates of the 15 randomly selected non-High Schools That Work vocational-technical high schools in Massachusetts for the years 1999, 2000, and 2001. The results of this research will be shared with the Massachusetts School To Career cluster in the Massachusetts Department of Education, all Massachusetts school districts with vocational-technical schools, especially those that are members of the High Schools That

Work network, and the Southern Regional Education Board, which is responsible for the High Schools That Work networks in 26 states.

Research Questions

This researcher questioned the effect of membership for 1999, 2000, 2001, and 2002 in the High Schools That Work network of vocational-technical high schools in Massachusetts on learner outcomes in high standards, high stakes assessments, specifically the Failing category of the Massachusetts Comprehensive Assessment System in English Language Arts and Mathematics when compared to learner outcomes in the Failing category on the Massachusetts Comprehensive Assessment System in English Language Arts and Mathematics for 1999, 2000, 2001, and 2002 for non-High Schools That Work vocational-technical high schools in Massachusetts. This researcher also questioned the effect on the dropout rate of students for 1999, 2000, and 2001 from vocational-technical high schools in Massachusetts with membership in the High Schools That Work Network when compared to the dropout rates of students for 1999, 2000, and 2001 from vocational-technical high schools, that were not members of the High Schools That Work network in Massachusetts.

Conclusions drawn from this study address the question of efficacy of the High Schools That Work school reform initiative in public secondary vocational-technical schools in Massachusetts.

Significance of the Study

The conclusions from this study should help to encourage public secondary vocational-technical high schools in Massachusetts and other states to evaluate their current school reform models based on the efficacy of the High Schools That Work

model on public secondary vocational-technical high schools in Massachusetts and whether to commit resources for continuing or implementing this reform model. The results from this study will also be shared with the Southern Regional Education Board, the group directly responsible for the High Schools That Work reform model in 26 states.

Definition of Terms

In order to better understand the historical perspective of academic and vocational-technical education in the United States, it is important to recognize the associated educational jargon of the past and the present. To begin with, a definition of **vocational education** begins to emerge with the Congressional passage of the first Morrill Act in 1862, which established publicly funded land-grant colleges that in addition to teaching classical studies and sciences, were “to teach such branches of learning as are related to agriculture and mechanic arts...” (Alexander and Alexander, 1992, p. 51). The Smith-Hughes Act of 1917 was more specific in its reference to vocational education because it “...provided for funds for vocational education below college level...” (Alexander and Alexander, 1992, p. 51). However, it was the Vocational Education Act of 1963 that substantially increased federal funding for vocational education and contributed to its present definition by the U.S. Department of Education; vocational education is defined as “organized, educational programs, services, and activities that are directly related to the preparation of individuals for paid or unpaid employment, or for additional preparation for a career that does not require a baccalaureate or an advanced degree” (School-to-Work Glossary of Terms, 1997, p. 63).

Vocational studies are traditionally offered in three areas: (1) consumer and homemaking education, which prepares students for roles outside of the traditional labor

market; (2) general labor market readiness; which prepares students with general-entry, labor-market skills necessary for paid employment; and (3) specific labor market readiness, which prepares students for particular vocations such as the service industries, trade, technology, and communications. Vocational education and occupational education are two terms often used synonymously. However, for the purposes of this study, **occupational education** will be defined as “a generic term reflecting formalized experiences associated with exploring and preparing for the world of work” (Dr. William Thuemmel, from a lecture presented at the University of Massachusetts, Amherst, September 11, 1996). This definition is furthered by the School-to-Work’s definition of “occupational cluster” as “... a grouping of occupations from one or more industries that share common skill requirements” (School-to-Work Glossary of Terms, 1997, p. 41).

Academic education is defined as “having to do with general or liberal rather than technical or vocational education” (McKechnie, 1961). **General or liberal** education is defined as “a general, extensive education, not necessarily preparing the student for any specific profession” (McKechnie, 1961).

Technical education as defined in the *School-to-Work Glossary of Terms* (p.60)

... is a program of vocational instruction that prepares individuals for positions, such as draftsman or lab technician, in different occupational areas requiring a range of skills and abilities. Technical education typically includes the study of the sciences and mathematics underlying a technology, as well as the methods, skills, and materials commonly used and the services performed in the technology. **Vocational-technical education** as defined in the Carl D. Perkins Vocational and Applied Technology Education Act of 1998 (Perkins III) is... organized educational programs offering

sequences of courses directly related to preparing individuals for paid or unpaid employment in current or emerging occupations requiring other than a baccalaureate or advanced degree. Programs include competency-based applied learning which contributes to an individual's academic knowledge, higher order reasoning, problem solving skills, and the occupational-specific skills necessary for economic independence as a contributing and productive member of society (Perkins, p.1). The **integration of academic and vocational-technical education** is the combining of traditional academic classroom practices and content with the traditional classroom practices and content, hands-on laboratory work, and on-the-job training of vocational education.

An Historical Perspective: The Integration of Academic and Vocational-technical Education

The historical purpose of public education in the United States has always been to prepare its students to become productive members of the society. The definition of “productive members” can be loosely interpreted as what is perceived to be necessary in order to perpetuate the democratic system and its interrelationship with the economy. This idea is exemplified by the original colonies through their close ties to England. These ties were maintained through stock companies, royal governors, individual proprietors, and colonial legislatures. These original power brokers controlled early education. The earliest colonies paralleled English society, which had an aristocratic ruling class and a poor working class. Children of the aristocracy were afforded an education because their places as future leaders and captains of emerging industry would require it. The best hope for a member of the working class was an apprenticeship or training at some low-level occupation. In fact, at the beginnings of the evolution of the

public school system, we see the seeds for a student tracking system. Although contemporary tracking systems are often defined by student ability, in our early history, a student's membership in a social class lead to a similar outcome: limited opportunity for those destined by birth to a lower track.

The earliest Latin grammar schools were for the aristocracy, and apprenticeship schools were designed for the lower, working classes. Established churches and strong political groups received little or no opposition until the seeds of freedom and independence began to take hold and nurture. Evidently, people from our earliest historical period began to realize the importance of education and its role in independence. Dissident groups denied the right to an aristocrat's education began to agitate for the right to an equal educational opportunity. This was the point at which colonial governments apparently began to recognize the benefits of an educated populace. This was the spirit in which the Massachusetts Bay Colony passed the Schools Act of 1642. The Act required towns of 45 or more to hire a teacher. It was in 1647 that the Massachusetts Bay Colony passed the Old Deluder Satan Act. The Act's premise was that an uneducated population was a breeding ground for Satan: "It being one chief project of the old deluder Satan, to keep men from the knowledge of the Scriptures . . ."

(Alexander and Alexander, 1992, p. 24). Alexander and Alexander also point out that the Act did instruct towns of one-hundred families or households to " . . . setup a grammar school, the master thereof being able to instruct youth so far as they may be fitted for the university . . ." (p. 24). This direct reference to the university is perhaps early evidence that some of our forefathers were thinking beyond the parameters beneficial solely to the church.

The next great leap in public education begins with the social reformer, Thomas Jefferson, whose philosophy can best be summarized by his own words: "I have sworn upon the altar of God eternal hostility against every form of tyranny over the mind of man" (Jones, 1961, p. 58). He often wrote eloquently of education being a natural right and legislated for access to public education because he believed it would maintain a democracy. Although unsuccessful in his first attempts to overhaul the Virginia system of public education, which would have resulted in free public education for all through the university level, Jefferson was credited with directing a "bloodless revolution in the economy and society of the Old Dominion" (Jones, p. 60). He had hoped for a post-secondary institution "based on the illimitable freedom of the human mind to expose every subject susceptible and its contemplation" (Jones, p. 68). The University of Virginia was the creation of Thomas Jefferson. He was involved with every aspect of the University's creation from writing curriculum, hiring faculty, selecting books for the library, serving as architect for the buildings to functioning as superintendent of construction. According to historians of the time, "The result was the most progressive curriculum, the best faculty, and by far the most beautiful group of buildings and the handsomest landscaping in the country" (Jones, p. 68).

As a national mentor for the emerging mind, soul and conscience of a new nation, Jefferson exhibited his passion for music, architecture, science, religion, philosophy, law and education. In fact, he sold his collection of books to Congress in 1814, and this collection became the basis for the Library of Congress. Jefferson's "Preamble To A Bill For The More General Diffusion Of Knowledge" can be interpreted to mean that the newly forming American society demanded that an educational system be constructed,

that would guarantee the continuance of that free society.

The next forward movement in public education comes with Horace Mann, the key player in developing and forming the elementary school system in the United States. Mann became the nineteenth century's leading advocate for public and compulsory education. His philosophy is perhaps best summarized in one of his last public statements to departing students at Antioch College: "Be ashamed to die until you have won some victory for humanity" (About Antioch College, 2001, p. 1). Foregoing his law practice in 1837, his personal road to victory began with his appointment to the new Massachusetts State Board of Education, where he fought for educational reforms that would eventually be followed by almost every state in the Union. It was in Lexington, Massachusetts where Mann founded the first state normal school to improve the quality of public school teachers. In his Tenth Annual Report in 1846, Mann spoke of "the absolute right of every human being that comes into the world to an education; and which, of course, proves the correlative duty of every government to see that the means of that education are provided for all" (Cremin, 1961, p. 127). Unlike most American and European school structures that divided students into classes (management [aristocracy] and labor [the poor]), Mann believed that everyone, regardless of class, should have an opportunity for learning, which he believed would lead to an equal chance for earning and the security that came with the ability to earn. Perhaps one of the earliest recorded allusions to the integration of academic and vocational-technical education comes from Mann: "The greatest of all the arts in political economy is to change a consumer into a producer; and the next greatest is to increase the producing power—an end to be directly attained, by increasing his intelligence ..." (Cremin, p. 129).

To Mann's credit, Massachusetts enacted the first compulsory education law in 1852. The law fostered the idea that the state had an obligation to help to ensure a responsible citizenry. This basic idea of a responsible citizenry began a pattern of education that supported compulsory attendance, local controls over schools, and local tax supports for the schools. However, because the nation as a whole still lacked a uniform approach to public schooling, there was no clear-cut mandate to integrate an academic education with any type of vocational-technical education. The central states developed a version of the public school system, which was established primarily by churches. This system resulted in common or pauper schools. The South still clung to its tradition of private schools.

Controversies, which paralleled the controversies surrounding capitalism, humanitarianism, socialism, communism, and fascism, also buffeted the public schools during the twentieth century. The competing ideologies also served to fragment a national approach to public education. Conservatives held a hands-off, capitalism-is-good approach to government. Truman's Fair Deal advocated a big brother role for government, which was a humanitarian approach necessitating intrusion by government. Both socialists and communists held a Marxist view that capitalism was inherently evil because it prevented an equitable distribution of goods. Fascists believed that power was the right and responsibility of an elitist few who needed to employ any means in order to gain their ends.

The year 1900 bore witness to a movement in the political pendulum from conservatism to humanitarianism and provided a platform for social engineering. Education prospered under such government-sponsored programs as the National Resources Planning Board. The Board's "Bill of Rights" included "the right to

education, for work, for citizenship, and for personal growth and happiness..." (Butts, 1955, p. 512). The beginning of the twentieth century was also the time of much controversy concerning the role of vocational education in the public school system. The attitude of the general populace had begun to change and develop a strong support for vocational education. Both industry and labor realized a need for more skilled labor as a result of an expanding industrial revolution. The federal government was experiencing these pressures from such groups as the National Society for the Promotion of Industrial Education and the Association of Agricultural Colleges and Experiment Stations. The real controversy concerned the debate between two very different philosophies as they applied to the role of vocational education in the public school system. One side of the debate argued for a dualism believing that it was imperative to separate vocational studies from the traditional curriculum while the other side believed that vocational and academic studies should complement each other.

Two nationally prominent figures fought for each side of the question. Charles Prosser argued on the side of a "social efficiency, which contends that schools should be reformed to meet the needs of a technocratic society" (Finch and Crunkilton, 1999, p. 7). John Dewey, on the other hand, "believed that the industrial education movement of the day had some positive potential, but felt it should prepare the way for a more humane technological society..." (Finch and Crunkilton, p. 7). Dewey's side lost the debate and Prosser's idea of separate but equal became part of the Smith-Hughes Act of 1917.

The Smith-Hughes Act was differentiated in purpose from its ground-laying predecessors: the Morrill Act of 1862, which established post-secondary instruction in farming, business and industry; the Hatch Act of 1887, which established research

stations at the land-grant colleges; and the second Morrill Act of 1890, which provided public funds for the land grant colleges.

The Morrill Act of 1890 added additional direct appropriations to the land-grant colleges established under the Morrill Act of 1862. In addition, the Morrill Act of 1890 added a historically altering provision, which stipulated that land-grant colleges could only receive the additional funds if they admitted blacks to their programs or if they offered separate but equal agricultural higher education to black students. Congress designated Tuskegee University an 1890 school at a later date.

The Smith-Hughes Act funded states providing vocational education through an agreement called the State Plan for Vocational Education. It allowed for federal payments to states to help train teachers in areas such as agriculture, trade, home economics, and established and emerging industries. These federal dollars were also used to help pay teacher salaries. The United States Office of Education worked in cooperation with state boards of education to help administer the act. States furnished equipment for programs and outlines for courses, which had the approval of the federal board. This partnership between the federal and state levels helped tremendously to move forward vocational education.

The year 1900 witnessed a movement in the political pendulum from conservatism to humanitarianism. It became a time of social engineering. Education prospered under such programs as the National resource Planning Board's "new bill of rights" (Butts, 1955, p. 518):

1. The right to work, usefully and creatively through the productive years;
2. The right to fair pay, adequate to command the necessities and amenities of life in

exchange for work, ideas, thrift, and other socially valuable services;

3. The right to adequate food, clothing, shelter, and medical care;
4. The right to security, with freedom from fear of old age, want, dependency, sickness, unemployment, and accident;
5. The right to live in a system of free enterprise, free from compulsory labor, irresponsible private power, arbitrary public authority, and unregulated monopolies;
6. The right to come and go, to speak or to be silent, free from the spying of secret political police;
7. The right to equality before the law, with equal access to justice in place;
8. The right to education, for work, for citizenship, and for personal growth and happiness [italics added];
9. The right to rest, recreation, and adventure, the opportunity to enjoy life and take part in advancing civilization.

The climate for education changed with the new Republican conservatism under Dwight D. Eisenhower. The McCarthy hearings took place during 1954, two years after the Republican presidential win. Educators had reason to become depressed and disturbed because the McCarthy era's basic attack was on freedom of thought, a basis for traditional academic education.

Butts (1955) observed that social trends of the twentieth century began to effect family, communities, and schools. During the 1950s, fifteen million workers belonged to labor unions. Immigration slowed to a trickle, but there was an explosion in the birth rate resulting in inadequate space in the public schools. There was a rapid inclusion of

women into the work force during World War II, and this seemed to add to the destabilization of the traditional family unit. Society also became extremely mobile during the postwar era. Racial and religious groups as well as nationalities became targets for hate groups, and the national conscience was stirred, as it became increasingly apparent that the ideals that America preached were not often practiced. Separate but equal did exist along lines of race, finance and equity issues. It was not until 1954 that Chief Justice Warren delivered the United States Supreme Court opinion in a school desegregation case, *Brown v. Board of Education of Topeka*, that "Separate-but-equal facilities are inherently unequal" (Alexander and Alexander, 1992, p. 414). Federal intrusion into the local public school systems became necessary to help balance the scales of justice. Butts (1955) points out that the G. I. Bill enabled eight million servicemen to receive fourteen billion dollars worth of education and training. The federal government supported colleges and universities to pursue fundamental research. Three-hundred-million dollars were spent in 1952 to emphasize science, technology, agriculture, industry, medicine, and public health.

By 1981, every state had passed some form of a compulsory educational attendance policy. States pushed for an earlier mandatory attendance in a public setting, but the United States Supreme Court struck this down in 1925, and according to Butts (1955), this enabled white flight from public schools in urban settings.

Butts (1955) also notes that the first half of the twentieth century witnessed a variation in the structure of public schools between states. The usual structure was an eight-year elementary schooling, a four-year high schooling followed by four years of college. Situations changed dramatically by the mid-twentieth century. Nursery school

and kindergarten were added to the eight-year school experience as a direct result of the Work Projects Administration (WPA) programs designed to combat the Great Depression. They were the result of the industrial character of the twentieth century. How could youth be developed into productive members of the society if the traditional family unit was changing? Stated bluntly, necessity became the mother of invention. Babysitters were needed—babysitters capable of developing the young child into a productive future member of society. Society argued successfully that the growth patterns of children did not fit the traditional 8-4 plan. The 6-3-3 plan (6 years elementary, 3 years junior high, and 3 years of high school) gained popularity during the 1960s . With such a popular configuration, it was a natural evolutionary step to add a “junior college” to the mix. This helped fix the direction of a public education through the age of 20.

The latter part of the twentieth century witnessed a shift in the workplace from low skills-high wages to high skills-high wages. In 1984, Congress passed the Carl D. Perkins Vocational Education Act, which, in effect, repealed the Vocational Education Act of 1963. Although the Act of 1963 liberalized the influence of Prosser and loosened the Smith-Hughes Act of 1917, the Act of 1984 was the first significant break with the philosophy of Charles Prosser. The federal government would now contribute to the funding of programs that would integrate both academic and vocational education. This shift began to fuel a change in both educational philosophy and legislation. Ronald Reagan was in the White House and Terrence Bell, who had supported the creation of a cabinet-level Department of Education under Jimmy Carter, had agreed to become Secretary of Education if he could restructure the department to a lesser than cabinet-

level position without allowing it to revert to the U.S. Department of Health, Education and Welfare. Although unsuccessful in his attempt at initial restructuring of the Department of Education, Bell was successful with the idea of a presidential panel on education, and this cabinet-level commission would be backed by all of the support and resources available to the Department of Education. The result of the blue-ribbon commission's 18-month study was A Nation at Risk: The Imperative for Educational Reform. With the report's release in April of 1983, John Dewey's philosophy now seemed more appropriate for the emerging workplace, and the issue of educational reform suddenly became a hot-button topic on the public agenda. According to Hunt and Staton (1996, p. 271): "This report was considered the spark that fueled educational reform policy, corporate involvement, gubernatorial attention, and legislative action culminating in the passage of *Goals 2000: Educate America Act* in March of 1994." A member of the commission perhaps best stated this need for total reform when he said, "The facts had taken over. ...the commission found itself, in the end, pushed by the data to the shared conviction that the state of American secondary-school education demanded systematic reform." (Hunt and Stanton, 1996, p. 273). On February 27, 1989, Representative Hawkins introduced a bill which would amend the Carl D. Perkins Vocational Act of 1984 and further the movement to integrate academic and vocational education. A short title for this bill was the Tech-Prep Education Act. Of major significance, this reauthorizing of the Perkins Act (funding from 1990 through 1996) added the wording "Applied Technology," and stated :

"It is the purpose of this Act to make the United States more competitive in the world economy by developing more fully the academic and occupational skills of all

segments of the population. This purpose will principally be achieved through concentrating resources on improving the educational programs leading to academic and occupational skills competencies needed to work in a technologically advanced society” (Academic Innovations, p.1).

Part F of Title III of the Act added and funded a program of grants to consortia of local educational agencies and community colleges to offer tech-prep programs. It also defined a “tech-prep education program” as a combination secondary and post-secondary program that would encompass the following criteria: (a) It would result in a two-year certificate and/or an associate’s degree; (b) It must offer advanced technical preparation in areas such as agriculture, business, health, applied science, or mechanical or industrial trades; (c) It must include competencies in mathematics, science, and communications; and (d) It has to lead to placement in employment and/or further education. Another significant part to this Act was in Title IV, which changed the provisions for national assessment of vocational education programs under the Act. Title IV “Requires such assessment to compare, where practicable, the impact of vocational education programs with the impact of non-vocational secondary education and liberal arts postsecondary education programs on achievement of academic skills and employment opportunities” (Thomas, p. 4). It also revised the formula for limitations of expenditures allowing for some funding of programs that would have been defined as academic rather than vocational. Title IV of the Act also allowed for funding “through grants or contracts to public colleges or universities, up to ten vocational education leadership development institutes to: (1) improve response to the needs of the labor market and special populations; (2) develop professional leadership; and (3) develop secondary vocational

education partnerships with business, industry, and labor.” (Thomas, p. 4). These revisions to the Act were implemented in 1990. It was also in February of 1990 that the federal government convened the Secretary’s Commission on Achieving Necessary Skills. Its purpose as stated in the School-to-Work Glossary of Terms (p. 45) was “to examine the demands of the workplace and to determine whether the current and future workforce is capable of meeting those demands.” The Commission identified five skills (competencies) it deemed necessary for success in the emerging workplace and three “foundations” or skills that are the basis for competencies. The five Secretary’s Commission on Achieving Necessary Skills competencies deal with the workers’ productive use of resources, interpersonal skills, information, systems, and technology. The emerging workforce needed to be able to manage its resources of time, money, materials, space, and staff. This emerging workforce also needed interpersonal skills that supported working on teams, the ability to teach others, serving customers, solving problems through leadership and negotiation, as well as working with people from culturally diverse backgrounds. This new workforce needed to have the ability to look at information in added ways. It needed to acquire and evaluate data, to organize and maintain the data, to interpret and then communicate the data using computers as the processors for all of these data. This new workforce needed a basic understanding of social, organizational, and technological systems and the ability to monitor and correct performance while designing new systems and amending old systems. A basic understanding of technology would become important for the new workforce. This emerging workforce needed the ability to select necessary tools and equipment while applying new technologies to specific jobs, along with the ability to maintain, upgrade,

and troubleshoot these new technologies. The foundations for these competencies rely heavily on academics.

According to the Secretary's Commission on Achieving Necessary Skills report, there were three "foundations" needed for these competencies. The first foundation group was reported under the heading of "Basic Skills": the ability to read and write, to do arithmetic and mathematics, the ability to speak, and the ability to listen.

The second foundation group included the "thinking skills": the ability to think creatively, the ability to make decisions, the ability to problem solve logically, the ability to conceptualize, the ability to recognize alternate learning styles, and the ability to reason.

The third "foundation" addressed necessary personal qualities such as the need for personal responsibility, the need for positive self-esteem, the need for social interpersonal skills, the need for self-management, and the need for integrity.

On March 31, 1994, President William Jefferson Clinton signed into law the Goals 2000: Educate America Act. The specific purpose of this Act was to provide "resources to states and communities to develop and implement educational reforms aimed at helping students master academic and occupational skill standards" (School-to-Work Glossary of Terms, p. 26). Goals 3, 5, and 6 hold special importance for the integration of academic and vocational education: (Goal 3) Student Achievement and Citizenship states that all students will demonstrate competency of challenging academic subjects along with skills that will enable them to function in a free society, (Goal 5) Mathematics and Science states that students will be first in the world in their science and math achievements, and (Goal 6) Adult Literacy and Lifelong Learning states that every adult

American will be literate and possess the knowledge and skills necessary to compete in a global economy ... The School-to-Work Opportunities Act of 1994 also strengthened the ties between academic and vocational education by helping to define the emerging "high performance workplace" as "A workplace that employs sophisticated, technically advanced and efficient production techniques."

The Act also stated that, "In order for this type of workplace to function, workers must be equipped with advanced thinking and occupational skills that enable them to learn on the job, adapt to rapidly changing technology, and work in teams to solve problems. In addition to their economic development potential, high performance workplaces may help drive school reform by providing educators with a set of occupational skill standards that are required for marketplace success" (School-to-Work Glossary of Terms, p. 28). President Clinton signed the most current document that promotes the integration of academic and vocational education into law on October 31, 1998. The Carl D. Perkins Vocational and Technical Education Act of 1998 replaced the Perkins Act of 1990 and acted as a five-year authorizing law. This most recent Perkins Act defines vocational-technical education

... as organized educational programs offering sequences of courses directly related to preparing individuals for paid or unpaid employment in current or emerging occupations requiring other than a baccalaureate or advanced degree. Programs include competency-based applied learning which contributes to an individual's academic knowledge, higher-order reasoning, problem solving skills, and the occupational-specific skills necessary for economic independence as a productive and contributing member of society (The Carl D. Perkins Vocational

and Applied Training Act, Public Law 101-392, p.1).

The Carl D. Perkins Vocational and Applied Training Act reiterates several points concerning the significance of vocational-technical education. It states the need for a workforce with both academic and vocational skills that are needed to compete successfully in our global economy. It does so by encouraging the exploration of career options while developing those skills both in school and the workplace. The Act proposed an acceptance of different learning styles through a combination of pedagogical approaches encompassing traditional classroom instruction, laboratory application of learning and, on-the-job training. The approach should prepare students for postsecondary education as well as employment, keeping in mind that in 1996 only 20% of America's jobs required a four-year college degree. The Act has brought federal recognition and acceptance of the philosophy of John Dewey by advocating for the incorporation of school-based and work-based learning. It identified partnerships with business as a major component of a successful educational program and recognized the essentialness of postsecondary education, up to and including universities, for most occupations. It recognized the use of emerging and current higher technologies and the uses of cyberspace as a resource for contemporary vocational-technical education. James Hettinger, a contributing editor to Techniques indicated, "The new Perkins law would further strengthen academic and vocational-technical education." (January, 1999, p. 40)

The history of public education in the United States seems to have mirrored the basic economic needs of the country. From the time of the early colonists, whom needed an educated, self-reliant and self-sufficient populace to further strengthen and move forward the ideals of a democratic nation, to the present, which needs a critically thinking and

technologically skilled workforce, public education continues to respond to the needs of the nation. However, a continuing problem with our system of public education has been the strong resistance to change based on generational perceptions that it was not necessary to tinker with a system, which had worked in the past. Nevertheless and after much public debate that was initiated by John Dewey and Charles Prosser in the early twentieth century, public education has moved from a separation between academic and vocational education into a twenty-first century acceptance of the need for an integration of high standards, core academic and vocational-technical education.

CHAPTER 2

REVIEW OF THE LITERATURE

Leadership Models

In order to examine approaches to the integration of high standards, core academics such as literacy and mathematics with vocational-technical education, it is necessary to look at leadership models, curriculum models, the role of alliances and partnerships in integration, and the evolving role of the community in the process because they are so closely interrelated. The literature reviewed analyzes the effectiveness of the various approaches for integrating high standards, core academics with vocational-technical education.

Public Schools in the United States are complex organizations, which have been given a mandate to reform beginning in the mid-1980s with a call for excellence in public education. The call continues today with insistence on increased academic standards, increased course rigor, increased accountability, increased high school graduation requirements, and increased college admission standards. Unlike most attempts at system tinkering and tweaking, this reform movement has called for whole-system changes within the nation's public school systems. Site-based management became an integral part of the United States reform movement. The move from central administration's role as micro-managers began to shift with the responsibility of site management given to individual building principals. The role of the building principal changed dramatically and the successful management of a site became more dependent on the principal's leadership style. The building principal had to become a leader who could break through the traditional separation that had existed between academic and vocational-technical

education. The principal also has the dual function of a manager. Warren Bennis and Burt Nanus in their book Leaders: The Strategies for Taking Charge state: "A manager does the thing right; a leader does the right thing" (p. 4). In other words, a manager performs a task following given guidelines without analyzing the process, while a leader analyzes the process and attempts to improve the process resulting in increased positive outcomes. An effective principal is faced with performing the functions of both roles.

Although there does not seem to be a universal consensus for the definition of leadership, there is some consensus on leadership definitions and management models. Lunenburg and Ornstein state that a manager is "concerned about carrying out policy" and a leader "formulates policy." The "manager thinks in terms of trees " and the leader "has a larger view of life and deals with the forest" (1991, p. 119). Hersey & Blanchard (1982, pp.1-13) rely on the research of Harold Koontz and Cyril O'Donnell (1964) in reaching the conclusion that there is a distinction between leaders and managers, and the distinction lies in the functions of managers and leaders. Managers are responsible for implementing organizational goals while leaders are responsible for influencing the behaviors of individuals or groups. Managers in a school setting must plan, organize, motivate, and control. They must be able to produce an environment in which students can achieve minimal competencies in an academic setting and use those competencies to become productive members of a community. They need to be innovative in their planning to meet the varied and changing needs of a community. The principals must be knowledgeable in the methods for implementing site changes while integrating these changes in a least disruptive manner.

Regardless of the type of manager model, managerial ability is most often assessed as a three-skill taxonomy including technical skills, interpersonal skills, and conceptual skills. For a principal, technical skills include the ability to establish future budgetary needs and to assess evolving curriculum models and pedagogical approaches, along with other various site needs including everything from school climate to the actual physical plant. The principal must have an understanding of human behavior and interpersonal processes and the ability to communicate effectively. She or he must possess conceptual skills in order to analyze the immediate and future needs of the site. This would include the ability to think logically and form concepts that are often complex and ambiguous (Yukl, 1989, pp. 173-203).

Taylor Model

Formal management perspectives did not exist prior to the nineteenth century. It was not until Frederick W. Taylor, a laborer in the steel industry, began a scientific study of management that management models began to emerge. Taylor's model of scientific management has an underlying foundation of four principles. The first principle deals with a thorough job analysis. Data gathering, direct observation, and measurement of performance conduct the analysis. The second principle deals with the selection of personnel for particular jobs. Workers are selected and trained for particular jobs. The third principle addresses issues of cooperation between managers and workers in order to ensure that workers are performing according to scientific principles such as time and motion. The fourth principle deals with a division of work between workers and management. This principle ensures that managers do the planning, organizing, and decision-making (Taylor, 1911).

While Taylor's management system focused on individual workers, a second management system, largely attributed to Henri Fayol, called "administrative management" began to focus on the management of the entire system. Although division of work was central to both approaches, Fayol believed that management and managers had five functions: planning, organizing, commanding, coordinating, and controlling. Luther Gulig added the functions of reporting and budgeting to Fayol's five functions. Max Weber contributed to administrative management by introducing a bureaucracy based on well-defined guidelines. These classical management theorists relied on economic incentives to ensure worker performance. It was not until the late 1920s and early 1930s that a new management theory began to evolve as result of the works of Elton Mayo and his associates when they conducted their "Hawthorne Studies" at the Hawthorne Plant of Western Electric in Chicago. Their human relations approach to management found that increased worker productivity was the result of effective management that included a manager's interpersonal skills such as the ability to motivate, lead, communicate, and promote participation in decision-making. The works of other researchers such as Kurt Lewin, Carl Rogers, and Jacob Moreno furthered their findings. Both models of management fueled debate, and although Chester Barnard was considered a human relationist in terms of management theory, he was the first to advocate a behavioral science approach to management. The behavioral management model is built on the premise that a manger must possess both interpersonal or "human" skills as well as technical skills. In such a system, the organization's goals are balanced with the goals of the individuals within the organization (Lunenburg & Ornstein, pp.1-23, 118-242).

Deming Model

It was Dr. W. Edwards Deming who most recently brought to the forefront of managerial styles the idea of valuing the input of the individual worker. Although Dr. Deming had a distinguished reputation in Japan for many years, it was not until the United States was forced to confront issues of production in the face of global competition that Dr. Deming's ideas concerning quality control and production levels were given serious consideration. Dr. Deming believed that a manager's role also included the function of leadership. Within that function, the manager was responsible for helping individuals do a better job while also taking pride in what they did. Workers had to feel some ownership in the process. Management had to look at the whole picture and provide leadership by quantitatively assessing present needs as well as needs far into the future. He believed that it was an inadequate system that would hire management right out of college if the college graduate lacked the experience of ever having performed the job. (Voehl, 1995, pp.15-33).

Curricula and Pedagogy

The principal as manager and leader is not enough to ensure that the integration of academic and vocational-technical education is occurring. Curricula and legal issues also need to be addressed, as do the roles of the community and various educational partners, not to mention the politics involved in any complex organization. Some curriculum models seem to enhance the integration of academic and vocational-technical education. These models address, either in part or in entirety, SCANS (the Secretary's Commission on Achieving Necessary Skills). They also share some commonalties in their

running through the various approaches is that they are patterned on a student-centered learning model. Student-centered learning is a sharp contrast to the traditional teacher-centered learning models in that the student and not the teacher is the center of the learning process. In the teacher-centered learning model, the teacher functions as an expert disseminating knowledge to the receivers, the students. John Sener, an instructional technologist, identifies the following student-centered learning characteristics:

1. Students are active participants in their learning rather than passive recipients.
Students have opportunities and increased responsibility to identify their own learning needs, locate learning resources, and construct their own knowledge based on those needs (rather than having a standard or identical knowledge base imparted on all students).
2. Students learn at their own pace and use their own strategies.
3. Students are more intrinsically rather than extrinsically motivated.
4. Learning is more individualized than standardized.
5. Student Centered Learning develops 'learning how to learn' skills such as problem-solving, critical thinking, and reflective thinking.
6. Student Centered Learning accounts for and adapts to different learning styles of students.
7. Student Centered Learning utilizes "authentic assessments" (rather than standardized assessments) that can evaluate each student's individual learning; assessment is more informative than summative (i.e., it's an ongoing activity that drives instruction rather than a culminating event (Sener, p.1).

Approaches to pedagogy seem to influence the levels of integration between academic and vocational-technical education. Team teaching is one such approach. Koob and Praem define team teaching in their book Shaping the Future as “a cooperative effort of two or more teachers, with complementary academic strengths, who work on a regular and purposeful basis to plan, to prepare, to present, and to evaluate learning experiences” (p. 2). If a vocational-technical teacher can be teamed with an academic teacher, this would seem to be the best of both worlds. However, certain factors would have to be carefully scrutinized. The roles of each team member would have to be clearly stated in order for true cooperation to take place. Interpersonal relations must be realistically assessed. Cooperative effort will grow as the process evolves. Team leadership is not as important as is team effort. Better preparation becomes essential because the old lessons, which rely on traditional approaches, will not work. Each member of the team relies on his or her particular talents. The team approach must be used regularly because of the amount of time needed to develop projects and lessons, and must have the support of administration (Koob & Praem, 1966, pp.1-6).

Finch & Crunkilton (1999) define curriculum as “...encompassing general (academic) education as well as vocational and technical education. Realistically, whether at the secondary or postsecondary level, the curriculum includes courses and experiences associated with preparation for life and for earning a living” (p.11).

Curriculum models by definition oftentimes influence pedagogy. Interdisciplinary curriculum and integrated curriculum are used synonymously. Interdisciplinary curriculum stands in stark contrast with discipline-field curriculum, which is still the

standard in most public high schools. Jean Piaget, a noted Swiss psychologist, defines “discipline field” as “ A specific body of teachable knowledge with its own background of education, training, procedures, methods, and content areas.” In other words, math is taught in a math class; history is taught in a history class, etc. This specialization by subject areas does have its advantages, and, perhaps, might explain why this is the way most postsecondary institutions have trained the largest numbers of teachers who are presently teaching. Specialization by subject area seems to be an efficient way to disseminate knowledge. It is also an efficient way to measure the acquisition of specific content knowledge, and it is the way that the community has traditionally been taught since the time of Aristotle.

Integrated curriculum also faces other problems in addition to the problems associated with discipline fields. Integrated curriculum requires a bottom-up approach because teachers design most units. Commercially designed units are not yet readily available. Units designed and utilized by teachers take some control away from central administrators who have traditionally tried to control what takes place in the classroom. It also poses some concern in regard to strict adherence to scope and sequence dictated at the district and state levels (Beane, 1997, pp.95-103). So why change? Again, an interdisciplinary curriculum model is a stark contrast to the discipline-field curriculum. According to Jacob (1989), interdisciplinary curriculum is defined as “ A knowledge view and curriculum approach that consciously applies methodology and language from more than one discipline to examine a central theme, issue, topic, or experience” (p. 8). Beyond the accepted fact that in the real world, math does not occur only at math time nor does English occur only at English time, etc., there are compelling reasons to

consider an integrated curriculum. Interdisciplinary curriculum seems to be a natural approach for the integration of high standards, core academics with vocational-technical education. Interdisciplinary curriculum requires some change, and change itself can be motivational in a classroom. Interdisciplinary curriculum affords students a comprehensive experience that parallels real-world experience. Its scope and sequence allows teachers to build units around themes and issues as they emerge from the ongoing curriculum. It seems to engage students in their learning. In a qualitative study of integrated curriculum, Pate, Homestead, & McGinnis (1997), state:

Our students indicated they were being challenged, becoming more responsible, becoming more self-directed, seeing their learning connecting to the world outside of the classroom, becoming independent learners, learning to work with others, and actively engaging in their own learning (p.46).

Kenneth Goodman (1986) makes a compelling argument for an integrated curriculum when he states

...integration is a key principle for language development and learning through language. For learners it's a single curriculum focusing on what is being learned, what language is used for. But for teachers there is always a double agenda: to maximize opportunities for pupils to engage in authentic speech and literacy events while they study their community, do a literature unit on Lloyd Alexander, carry out a scientific study of mice, or develop a sense of fractions or decimals. Speaking, listening, writing and reading are all happening in context of the exploration of the world of things, events, and ideas and experiences (p.30). Although the idea of project-based learning as part of the curriculum is not

something new (Dewey, 1933; Kilpatrick 1918), it is enjoying resurgence in popularity because of the way in which it addresses SCANS, enables students to operate at all six levels of Bloom's taxonomy (knowledge, comprehension, application, analysis, synthesis, and evaluation), and Howard Gardner's theory of multiple intelligence.

Project-based learning is a comprehensive approach to instruction that engages students in sustained and cooperative investigation. This approach is different from a traditional inquiry-based approach because most of the emphasis is placed on cooperative learning rather than individual learning. Projects themselves are best supported by an integrated or interdisciplinary approach. Project-based learning has two essential components:

1. A problem or driving question is the vehicle used to organize and drive activities which, when taken as a whole, amount to a project
2. An end product or multiple representations such as artifacts, papers, speeches, etc., that address the driving question. (Brown & Campione, 1994).

The problem or driving question must not be trivial. Students are required to ask and refine questions pursuant to a solution. This often leads to their asking new questions. They debate ideas and make predictions based on the data, which they have gathered and analyzed. They are engaged in designing plans or experiments, which lead to a solution of the problem or an answer to the guiding question. They are encouraged to draw their own conclusions and communicate their findings or ideas to others. A "driving question" must be authentic or based in the real world. It typically addresses several content areas. (Blumefield, Soloway, Marx, Krajcik, Guzdial & Palincsar, 1991).

Several distinctions can be seen between traditional instruction and project-based instruction. Traditional instruction places a heavy emphasis on content coverage while

project-based learning places the emphasis on depth of understanding. While traditional instruction is weighted towards knowledge of facts, project-based learning is geared toward comprehension of concepts and principles. Traditional instruction has a type of “Wonder Bread” building-block-of-skills-in-isolation approach, but project-based learning focuses on the development of complex problem-solving skills. Traditional instruction relies on a fixed curriculum, but project-based learning curriculum changes to accommodate students’ interests. The traditional teaching units are sequentially structured and followed block by block. Project-based learning addresses large units comprised of complex problems or issues. The traditional instructional approach is narrow and single-discipline based, but the project-based approach is interdisciplinary and broad. The teacher is a lecturer or director of instruction in a traditional model, but functions as both a resource provider and active participant in learning with project-based instruction. The teacher acts as expert in traditional discipline-based instruction, but assumes the role of advisor or colleague with project-based learning. Traditional instruction uses products, test and quiz scores, comparisons with other students, and regurgitation of information to assess learning. Project-based instruction assesses process as well as product, demonstration of understanding, gains over time, and tangible products. Textbooks, lectures, teacher-developed worksheets, and commercially produced worksheets are the standard tools of the trade in traditional instruction. Student-developed materials, student-generated data, interviews, direct sources, and printed materials are the tools of instruction in project-based learning. Technology is central to project-based learning. It is used directly by students in both research and development of their outcomes. Usually, it is the teacher who uses technology to

enhance her or his presentation in traditional instruction. Traditional instruction has the student competing with others in the classroom, working alone, and being spoon-fed information in traditional instruction. With project-based learning, students work cooperatively and collaboratively while gathering and synthesizing information. In traditional instruction, the students is expected to carry out teacher-directed instructions, rote memorize and repeat, perform brief tasks, and sit quietly and respond only when addressed. Working cooperatively and collaboratively in project-based instruction requires students to participate actively in self-directed activities, discover and then present and share ideas, engage in activities over long blocks of time, communicate, and take responsibility for their learning. Traditional instruction emphasizes knowledge of content, facts, terms, and mastery of isolated skills. Project-based learning requires the understanding of ideas and processes, and the mastery of integrated skills. Traditional instruction has as its goal a student who can perform successfully on standardized achievement tests; project-based instruction sets the stage for a self-motivated life-long learner (Tretten & Zachariou, 1995).

In summary, project-based learning meets the criteria advocated by SCANS, but it is met with concerns. Although it is authentic in approach, allowing both teachers and students to focus on central ideas and relevant issues, administration must provide adequate support in materials and the ways in which they evaluate student and teacher performance in the classroom. In other words, strict adherence to a national, state, and/or district curriculum may not be possible, nor does the project-based classroom fit the traditional concept of classroom behavior management where the teacher asks a question and a designated student replies. Project-based learning can be an engaging strategy

when students are confronted with difficult questions or problems whereby they become responsible for generating their own content and constructing their own knowledge. However, without sufficient professional development, teachers might be hesitant to engage in a project-based learning activity, and most might not be prepared for the complexities related to engaging students in challenging and reflective work (Blumenfield, Soloway, Marx, Krajcik, Guzdial, & Palincsar, 1991; Buck Institute for Education, 1999).

Standards-based Reform

Another parameter to consider when looking at the integration of academic and vocational-technical education is the system's response to standards-based reform as advocated by Goals 2000. Goals 2000 has provided states and local districts the flexibility and resource support necessary to institute reform from the bottom up. It encourages municipalities to offer opportunities to all students to achieve high standards. Standards-based education relies on the premise that students will perform at the levels of achievement and expectation that have been set. It requires the establishment of high standards in academic areas with the expectation that the increased standards will lead to an improvement in student achievement. Meeting increased standards becomes the focus of all parts of the learning community and is used to measure progress (McLaughlin, Shepard, & O'Day, 1995, p.1). President Bush furthered the commitment to standards-based reform at the national and state level in 1989 when he brought state governors together at the Education Summit in Charlottesville, Virginia. In 1992, the National Council on Educational Standards and Testing heralded the call for national standards coupled with a system of voluntary assessment. In 1994, Congress passed the

Goals 2000: Educate America Act which established the National Education Goals Panel mandating that state and federal officials report on progress made achieving goals.

Since enactment of the Education Reform Act of 1993 in Massachusetts, much work has gone into developing the Massachusetts Curriculum Frameworks, which provide the outline for meeting standards-based instruction. The Frameworks are a comprehensive set of academic standards for each subject grouped by organizational level (grades K-12). The standards meet the SCANS requirements, encourage Gardner's use of multiple intelligences, and adhere to Bloom's taxonomy for learning. They develop a set of grade-level objectives based on the standards. The Massachusetts Comprehensive Assessment System is used as a performance indicator of the stated objectives. Local districts are responsible for aligning their curriculum with the Frameworks, for developing a grade-to-grade scope-and-sequence, for establishing assessment procedures for each course, and for deciding the instructional approach for course content. These should be reflected in the district's written philosophy and the mission and vision statements of individual schools within the district.

Outcome-based learning (OBE), competency-based education (CBE), mastery learning, and performance-based learning are movements often confused, but never the less, often used and associated with standards and vocational-technical education. Outcome-based education is "...simply the establishment of expected goals or outcomes for different levels of elementary-secondary education, and a commitment to ensuring that every student achieves at least those minimum proficiencies before being allowed to graduate" (What Is OBE?, p.1). Performance-based learning and mastery learning can be used synonymously. Both gained popularity in the United States in the 1970s.

Performance-based learning and mastery learning differ from outcome-based learning in that mastery learning and performance-based learning require students to demonstrate proficiency in a given topic on a weekly or even daily basis before advancing. However, students are allowed to advance at their own rates of mastery.

Competency-based learning might include the concepts of outcome-based learning and performance based learning. Competency-based learning (CBE) is individualized and emphasizes what students know and are able to do. It allows for flexible methods in achieving desired outcomes and the standards for achieving mastery. Its proponents visualize it as a method to overcome the traditional divide between academic and vocational education because it puts theory into practice (Harris, Guthrie, Hobart, & Lundberg, 1995). Critics of Competency Based Education fault it for its excessively reductionism approach. They also criticize it as pedagogically unsound and rigid (Chappell, 1996). However, both sides of the argument believe that competency-based education is "...taking another step toward breaking down the divisions between general and vocational education" (Kerka p. 4).

An Overview: Whole School Models for Integration of Academic and Vocational-technical Education in the United States

In addition to curriculum models for integrating academic and vocational-technical education, there are also whole-school models for integrating academic and vocational-technical education. High Schools That Work is a whole-school model for integrating academic and vocational-technical education, which researchers have rated as one of the top three reform models for improving student achievement. In a study of 24 reform models conducted by the American Institute for Research and commissioned

jointly by the National Education Association, the American Association of School Administrators, the American Federation of Teachers, the National Association of Elementary School Principals, and the National Association of Secondary School Principals, High Schools That Work was recognized for its students' higher test score, increased attendance rates, technical assistance, and first-year implementation costs (Olsen, 1999). High Schools That Work strongly recommends a curriculum that blends the necessary content of college-preparatory course with contemporary vocational-technical studies in grades 9 through 12. The recommended curriculum contains:

1. At least four credits in English courses with the content and performance standards of college-preparatory English;
2. At least three credits in mathematics courses with the content and performance standards of college-preparatory algebra I, geometry, algebra II and trigonometry;
3. At least three credits in science, including two credits in courses with the content and performance standards of college-preparatory biology, chemistry, physics or applied physics;
4. At least three social studies credits in courses with the content and performance standards of college-preparatory courses;
5. At least four credits in an academic or vocational-technical major;
6. At least two credits in related academic or technical fields, including at least one-half credit in a basic computer course covering word processing, database entry, presentation software, and use of the Internet and e-mail (High Schools That Work: New Partnerships and a National Network to Improve High

School Education, p. 3).

High Schools That Work encourages development of a curriculum that incorporates project-based learning in order to make greater use of applied learning in non-vocational courses. The theory is that this will enable vocational-technical students to understand the usefulness of academic courses in order to gain a deeper understanding of academic concepts and skills. High Schools That Work encourages academic and vocational faculty members to work together in an integrated and interdisciplinary manner. It also recognizes the need of business, the community (including a deep parental involvement), and postsecondary representatives to form partnerships or alliances with the schools. High Schools That Work provides a Student Assessment based on the National Assessment of Student Progress followed by a survey of students taking the assessment to learn about their secondary experience including what they have been taught, how they have been taught, the system's student expectations, and the amount of effort they have put into their secondary experience. A formal transcript study is made to relate students' courses to outcomes in science, mathematics, and reading. A formal study and survey is made of administration, faculty, and counselors to help determine the amount of time academic and vocational teachers spend planning and working together and the types of professional development needed to help increase the quality learning opportunities for all students. Another significant aspect of High Schools That Work is its attempt to monitor graduates one year after high school in order to find out how well students have been prepared for the workplace and postsecondary education. High Schools That Work have outside teams conduct site visits to help determine the technical assistance needs of the sites and their progress toward improving

desired student outcomes. Site visits are followed by detailed reports. High Schools That Work has partnerships with the Southern Regional Education Board, the National Center for Research in Vocational Education, and Educational Testing Service (High School That Work: New Partnerships and a National Network to Improve High School Education, pp.1-12).

Tech Prep models meet the mandates of academic and vocational-technical integration. Since 1992, the National Center for Research in Vocational Education has conducted professional development institutes to study and assist in the implementation of Tech Prep. The institutes involve interdisciplinary teams of educators from 30 metropolitan areas including such large cities as New York, Chicago, and Los Angeles. The recommendations from these institutes include comprehensive integration of academic and vocational-technical curriculum (Bragg, 1994, p. 5). Tech Prep models demonstrate systemic change while offering additional learning opportunities to students. These opportunities arise from partnerships developed between high schools; higher education; and business, industry, and labor. Students pursue career paths beginning in high school and continuing with an associate's degree while setting the foundation for lifelong learning (Defining Tech Prep, 1995).

The School-to-Work models for integrating academic and vocational education often incorporate Tech Prep, youth apprenticeship, and/or cooperative education in the base of their models. School-to-Work models are designed around the theory that all students learn best when they understand the connections between their formal courses of study and their future careers. What they learn must be connected to real life and real work situations. School-to Work models have three basic core requirements:

1. School-based learning—classroom instruction based on high academic and business-defined occupational skills and standards.
2. Work-based learning—career exploration, work experiences, structured training, and mentoring at job sites.
3. Connecting activities—are designed to integrate classroom and on-the-job instruction while matching students with employers, and training mentors to help bridge the gap between school and work (National School-to-Work Learning Center, p.2).

Partnerships between secondary, postsecondary, and local businesses are essential to the school-to-work models where students learn about job possibilities by shadowing worker-mentors in the field, applying academics to tasks related to the job, experience the workplace firsthand, refine the skills necessary for a career, and realize the value of life-long learning as more jobs of today and the future require postsecondary options including college and technical schools. Classroom instruction is coordinated with the workplace experience and often includes project-based learning (School To Work Opportunities, 1996).

The public school system in the United States is involved in a reform effort based on the perception that there is need to develop and meet a set of national competencies or standards in order to meet the needs of the workforce in a globally competitive economy. Beginning with the Nation at Risk report and continuing into the present with *SCANS*, a strong force behind this reform movement has been political and that fact alone has brought some to consider the approach. Although some countries embrace the concept—the United States with the Secretary's Commission on Achieving

Necessary Skills, the National Vocational Qualifications system in England, the National Qualifications Framework in New Zealand, and Australia's National Training Board—there is a growing number of skeptics who feel that "...the approach is conceptually confused, empirically flawed, and inadequate for the needs of a learning society" (Kerka, p.1). Kerka refers to other researchers who argue "competency standards drive the curriculum, narrowing content" and "emphasize performance and outcomes over knowledge and cognition" (p. 2).

How does one assess student performance in a manner consistent with the Secretary's Commission on Achieving Necessary Skills and life-long learning? In addition to standardized assessments such as the Scholastic Aptitude Tests, Applied Competency Tests and program-specific measurements such as the High Schools That Work Student Assessment, assessments that come under the umbrella of authentic assessments seem to hold promise in those systems that make the attempt to integrate academic and vocational-technical education. According to Slavin, authentic assessment is defined as "measurement of important abilities using procedures that stimulate the application of these abilities to real-life problems" (Slavin, p. 2). One example of authentic assessment would be the Capstone or Senior Project, which had its birth in the Medford School District in Medford, Oregon. The Senior Project is student-centered, performance-based, and seemingly endless in topic coverage. Dr. Steve Wisely, Superintendent of the Medford School District, describes the Senior Project as an "...effort involving research, writing, producing a project, and making a presentation, [and] emphasis is given to improving and utilizing academic, fine arts, vocational, school-to-work, and technology skills" (Wisely, p.1).

A Senior Project must contain the following key components:

1. Students select the topic.
2. Students conduct research.
3. Students write a research paper.
4. Students produce a project related to their topic.
5. Students present their results to a panel composed of faculty members and community members who have expertise in the topic area.

A Senior Project becomes a requirement for graduation, thereby making it a high-stakes assessment. The Senior Project brings together the academic and vocational-technical faculties who are needed on the project assessment panel. It forces members of the panel to look beyond their own disciplines. The Senior Project is designed around criteria that include the student demonstration of higher order thinking skills, originality, and creativity. The Senior Project results in the following student achievement gains:

1. Increased time spent on homework and class work.
2. Improved written and oral communication skills.
3. A new proficiency in conducting research.
4. An increased ability to reason and to react intelligently to questions.
5. A capability to recognize potential problems and to solve them.
6. Improved grades, with many more A's and B's

each marking term. (Bottoms & Sharpe, no publication date, p.56)

A Senior Project allows students to work individually or in groups. It fosters collaboration between students and faculty, students and the community, and faculty from different disciplines. (Bottoms & Sharpe, no publication date, p. 52-56)

High Schools That Work

High Schools That Work is an initiative of the Southern Regional Education Board State Vocational Education Consortium. The consortium itself was formed in 1987 in partnership with 19 states "... united in an effort to raise the achievement of career-bound high school students" (Bottoms, 1993, p. iii). High Schools That Work is structured around 3 major goals, 10 "key practices for accelerating student achievement," 5 "key conditions for accelerating student achievement," and a recommended curriculum. (High Schools That Work: New Partnerships and a National Network to Improve High School Education, p.1-3). This limited publication also lists the following major goals, key practices for accelerating student achievement, and key conditions for accelerating student achievement:

1. To raise the mathematics, science, communication, problem-solving and technical achievement of more students to the national average and above.
2. To blend the essential content of traditional college-preparatory studies - mathematics, science, and language arts - with quality vocational and technical studies by creating conditions that support school leaders, teachers and counselors in carrying out key practices.
3. To advance state and local policies and leadership initiatives necessary to sustain a continuous school-improvement effort.

The first goal is supported through the implementation of ten "key practices for accelerating student achievement":

1. High expectations—setting higher expectations and getting more students to meet them.

2. Vocational studies—increasing access to intellectually challenging vocational and technical studies, with a major emphasis on using high-level mathematics, science, language arts and problem-solving skills in the modern workplace and in preparation for continued learning.
3. Academic studies—increasing access to academic studies that teach the essential concepts from the college-preparatory curriculum by encouraging students to use academic content and skills to address real-world projects and problems.
4. Programs of study—having students complete a challenging program of study with an upgraded academic core and a major.
5. Work-based learning—giving students and their parents the choice of a system that integrates school-based and work-based learning. The system should span high school and postsecondary studies and should be planned by educators, employers and employees.
6. Teachers working together—having an organization, structure and schedule giving academic and vocational teachers the time to plan and deliver integrated instruction aimed at teaching high-level academic and technical content.
7. Students actively engaged—getting every student involved in rigorous and challenging learning.
8. Guidance—involving each student and his or her parents in a guidance and advising system that ensures the completion of an accelerated program of study with an in-depth academic or vocational-technical major.
9. Extra help—providing a structured system of extra help to enable students who may lack adequate preparation to complete an accelerated program of studies that

includes high-level academic and technical content.

10. Keeping score—using student assessment and program evaluation data to improve continuously the school climate, organization, management, curricula and instruction to advance student learning and to recognize students who meet both curriculum and performance goals.

In order for students to achieve, not only are “key practices” necessary, but also the following “key conditions for accelerating student achievement” are necessary:

1. An organizational structure and process ensuring continuous involvement by school administrators and teachers in planning strategies to meet the key practices.
2. A school principal with strong, effective leadership, who supports, encourages and actively participates with the faculty in implementing the key practices.
3. A system superintendent and school board members who support school administrators and teachers in carrying out the key practices. This commitment includes financial support for instructional materials, time for teachers to meet and plan together, and six to eight days per year of staff development on using the key practices to improve learning.
4. Leadership from the superintendent and school board to involve employers and postsecondary institutions in the design and implementation of a school-based and work-based program to prepare students for employment and postsecondary education.
5. A commitment from the school board to support the school in replacing the general track with a more demanding academic core and either an academic or

vocational-technical major.

Tech Prep

Debra D. Bragg (1994, p 1) claims “Tech prep emerged from early efforts to reform vocational education.” These early Tech Prep efforts, which began in the 1960s, were based upon articulation agreements between secondary and postsecondary institutions. The federal government further encouraged these Tech Prep articulation agreements as a means to strengthen academic and vocational ties at the postsecondary level while also encouraging a limited integration of academic and vocational education at the secondary level during the 1970s and early 1980s. In fact, it was the National Commission on Secondary Vocational Education that recommended these changes in 1984. The Carl D. Perkins Vocational and Applied Technology Act of 1990 included the Tech Prep Education Act. The Tech Prep Education Act encouraged public policy in the direction of Tech Prep and its 2+2 articulation agreements. It also allowed for Tech Prep funding through states’ basic grant dollars. The Carl D. Perkins Vocational-Technical Education Act of 1998 encouraged the use of Tech Prep as a transitional vehicle as a part of its School-to-Work legislation and funding guidelines, but the federal definition of Tech Prep comes from Title III of Perkins (1990), which outlines Tech Prep as a combined secondary and postsecondary program:

1. leading to an associate degree or two-year certificate
2. providing technical preparation in at least one field of engineering technology, applied science, mechanical, industrial, or practical art or trade, or agriculture, or health, or business
3. building student competencies in mathematics, science, and communication

(including applied academics) through a sequential course of study

4. leading to placement in employment (Bragg, 1994, p.3).

According to Bragg (1994, p. 3), "By law, all local Tech Prep consortia are charged with addressing what is commonly referred to as seven 'essential elements' of Tech Prep.

These essential elements are: (a) formal, signed articulation agreements; (b) a core of required courses in mathematics, science, communications (including applied academics), and technologies in the two years of secondary school preceding graduation and two years of higher education or at least a two-year apprenticeship following secondary instruction; (c) curriculum development; (d) in-service training for teachers; (e) training for counselors; (f) equal access for special populations to the full range of Tech Prep programs; and (g) preparatory services to help all populations participate in Tech Prep. In addition to these 'essential elements' are the following 'fundamental components (h) of evolving Tech Prep models:

1. Secondary-to-postsecondary articulation is essential to create smooth transitions and reduce dropout, failure, and costly inefficiencies for students. Articulation to the postsecondary level opens doors to a wide array of career fields and enhances upward mobility for students beyond what they could expect with only a high school diploma. Eventually, through formal articulation between secondary, two-year, and four-year postsecondary education, it may be possible to eliminate the "terminal" stigma of vocational education by documenting its developmental and life-long nature, and its connection to other aspects of the total educational system.
2. Integrated and authentic core curriculum ensures progressively rigorous offerings

- and experiences for students in academics and broad career cluster areas beginning at the secondary level (or earlier) and proceeding to the two-year postsecondary level (or beyond). Building on horizontal and vertical curriculum alignment, the content— academic, occupational, and technical—is blended or merged in Tech Prep to create a highly motivational approach to learning.
3. School-to-work opportunities support learning through work-based experiences and offer opportunities to learn about and explore careers. These can occur in a variety of arrangements using structured individualized learning plans; work-based learning experiences such as 2+2 youth apprenticeships or cooperative education; or in-school experiences structured around career clusters. The goal of this component is to link learning in the school setting to the workplace and community.
 4. Inclusive educational opportunities are fundamental since the Tech Prep philosophy is that education must be accessible to everyone. To ensure this, preparatory and developmental experiences must be available to accommodate individual learner needs.
 5. Outcome-focused curriculum ensures that the graduates of Tech Prep have the skills, knowledge, and attitudes to be successful in maintaining whatever outcome they choose, whether it is a two-year or four-year college education, immediate employment, or military service. To achieve these outcomes, Tech Prep utilizes outcome assessments that are authentic and performance-based and promote continuous improvement as a top priority of program evaluation.
 6. Collaborative implementation creates shared responsibilities for Tech Prep among

key groups (e.g., educators, students, parents, employers, community agencies, and citizens) to ensure that the curriculum is relevant and well supported. (Bragg, 1994, p.p.3-4). The formal consortium arrangement required by the Tech Prep Act is central to providing a foundation and network for collaboration. It helps to solidify ownership of Tech Prep among key groups.

Bragg (1994, pp.4-7) reports that five Tech Prep models are emerging as responses to local educational needs: Pre-Tech Prep, Adult Tech Prep, Integrated Tech Prep, Work-based Tech Prep, and Tech Prep Baccalaureate Degree. Pre-Tech Prep uses a 4+2 configuration. Adult Tech Prep addresses the needs of adult students enrolled in two-year colleges. These students, after assessment, are placed in applied academic courses or advanced academic or technical courses. The Integrated Tech Prep model is constructed around comprehensive academic and vocational integration as its core curriculum. Work-based Tech Prep relies on a very strong commitment and relationship between education and employers. In fact, employers take on many of the responsibilities of educators. While the Tech Prep Act stipulates the Associate's Degree as an outcome for a Tech Prep program, the Tech Prep Baccalaureate Degree (TPBD) moves a step further by requiring the associate degree as a midpoint in attaining the baccalaureate degree.

President Bill Clinton signed the School-to-Work Career Opportunities Act into law on May 4, 1994. The purpose of this Act was to provide states with seed money to establish systems of partnerships between business, labor, government, education, and community organizations. The law did not create any new programs. However, it did allow for different education reform initiatives to come together "... to create a system - a

allow for different education reform initiatives to come together “... to create a system - a system to prepare youth for the high wage, high skill careers of today’s and tomorrow’s global economy” (National School-to-Work Learning Center, p. 1). The law encouraged states to look at reform initiatives such as career academies, High Schools That Work, Tech Prep, cooperative education, integrated curriculum, youth apprenticeships, and others, and use them as an infrastructure for student transition from school to the workplace. The infrastructure had to ensure students the opportunity to explore different careers and the skills necessary to obtain employment in those career fields. The infrastructure also had to provide opportunities for structured training as well as an opportunity to demonstrate those skills in a working environment. The Act also required the development of industry-standard benchmarks and education training standards necessary for each career. Although designed differently by each state, School-to-Work, according to the National School-to-Work Center, must have the following three common core elements:

1. School-based learning—classroom instruction based on high academic and business-defined occupational skill standards.
2. Work-based learning—career exploration, work experience, structured training and mentoring at job sites.
3. Connecting activities—courses integrating classroom and on-the-job instruction, matching students with participating employers, training of mentors and the building of other bridges between school and work.

Career Academies

Career Academies, often described as “schools-within-a-school,” have been in

description of career academies:

Career academies originated in Philadelphia in 1969. The academies targeted at-risk youth and were designed to combine academic course-work and vocational training through 'schools-within-a-school.' Today, over 100 similar programs exist, structured to prevent at-risk students from dropping out by providing a 3- to 4-year program which focuses student learning on a specific industry and career cluster (e.g., health, electronics, business). These programs aim to build long-term relationships between students and teachers and develop peer support and achievement through small learning communities within the school.

In career academies, each student takes a core of academic courses, and receives workplace exposure and career counseling, all of which integrate occupational and academic material based on an occupational theme. Students develop individual occupational and career goals, but do not earn formal, occupational skill credentials. Local employers help design school curriculum, donate equipment, and provide mentoring, and summer internships.

Career academies usually employ an interdisciplinary approach to classroom teaching. They are usually block scheduled and have small class sizes. The curriculum is a collaborative effort between various parties. Classroom speakers, field trips, and mentors are also included in the typical curricular structure. Students are usually placed into jobs related to their fields during the summers, and spend some portion of their senior year in a work experience program.

Youth Apprenticeships

Youth apprenticeship programs have three basic components: (a) a two-year sequence of courses tailored to meet the needs of each student's occupational and academic competencies, (b) training in the workplace with the training following a schedule taught by a skilled mentor, and (c) learning and training that is based on skill standards and competency levels, that have been developed by labor and industry (Project eXchange, 1996). Youth apprenticeship is designed to be an important part of a secondary student's basic education, which integrates academic and vocational education. Much of the learning occurs on the job and what occurs on the job is closely coordinated with what takes place in the classroom. Students, upon successful completion of a youth apprenticeship, exit with some sort of credentials recognized by industry.

Cooperative Education

Cooperative Education is responsive to local industry needs. With this model, students spend their mornings in academic courses recommended by a co-op director or coordinator. The afternoons are spent on the job for which they receive monetary compensation from the employer and credits toward high school graduation from the school system. The system is dependent upon local industries willing or able to take on cooperative education students. The rewards are the ability to network on the job, workplace exposure, monetary compensation, and a high school diploma (Bailey and Merritt, 1993).

In summary, this researcher has reviewed the literature on integrating high standards, core academics with vocational education including leadership models such as Taylor and Deming, curriculum models such as project-based learning and competency

based learning, whole-school reform models such as High Schools That Work and Tech Prep, and the roles in education of alliances, partnerships and the community.

CHAPTER 3

DESIGN AND METHODOLOGY

Research Question

The main purpose of this study was to try to determine the efficacy of the High Schools That Work school reform model on learner outcomes in 15 vocational-technical high schools using high standards, high stakes assessments such as the Massachusetts Comprehensive Assessment System in English Language Arts and Mathematics. The study also tried to determine the efficacy of the High Schools That Work school reform model on student retention rates by comparing the dropout rates between 15 High Schools That Work vocational-technical schools in Massachusetts with the dropout rates of 15 randomly selected vocational-technical high schools in Massachusetts that are not members of the High Schools That Work network.

Massachusetts vocational-technical schools are listed in the Chapter 74 Massachusetts Vocational-Technical Directory. Massachusetts vocational-technical schools, which are also members of the High Schools That Work network, are listed in the Massachusetts High Schools That Work Directory.

High Schools That Work is a whole school reform initiative, which began in 1987 as a network of 28 vocational-technical public high schools in 13 Southern states, serving as a response to the need to increase learner outcomes based on increased standards. High Schools That Work was the country's first multiple-state effort to address the needs of vocational-technical students by focusing on two goals:

1. To increase the mathematics, science, communications, problem solving, and technical competencies and the application of learning for career-bound students

to the national student average;

2. To blend the essential student content of traditional college-preparatory studies-mathematics, science, and language arts-with quality vocational and technical studies by creating conditions that support school leaders, teachers and counselors in carrying out the key practices (Career and Technical Education: High Schools That Work in Massachusetts, p.1).

Massachusetts first joined the High Schools That Work network in 1995 and awarded individual grants of \$20,000.00 per year for 5 years plus \$18,000.00 individual site membership fees for the following vocational-technical high schools: Blackstone Valley Regional Vocational-technical High School, Greater New Bedford Regional Vocational-technical High School, Minuteman Science and Technology High School, North High School, Putnam Vocational-technical High School, Quincy High School/Center for Technical Education, Salem High School, Taconic High School, Tri-County Regional Vocational-Technical High School, and Westport Academy High School. The Massachusetts Department of Education added the following sites with identical grants in 1998: Chicopee Comprehensive High School, Norfolk County Agricultural High School, Pittsfield High School, Silver Lake Regional High School, Somerset High School, Upper Cape Regional Vocational-Technical High School, Worcester Vocational High School, Dean Technical High School, Northampton-Smith Vocational Agricultural School, and Greater Lawrence Regional Vocational-Technical High School. The followings sites were added with identical grants in 2000: Assabet Valley Regional Vocational-technical High School, Attleboro High School, Bristol-Plymouth Regional Vocational-Technical High School, South Shore

Regional Vocational-Technical High School, and North Shore Regional Vocational-Technical High School. Massachusetts added the following sites with identical grants in 2002: Westfield Vocational High School, Montachusett Regional Vocational-Technical High School, and Southeastern Regional Vocational-Technical High School.

Massachusetts has made a substantial investment of approximately \$3,118,000.00 in the High Schools That Work initiative.

Selection Process

There are 96 vocational-technical high schools in the Commonwealth of Massachusetts (Chapter 74 Vocational-Technical Education Directory, p.iii). Thirty-one of these high schools are current members of the High Schools That Work network with 10 sites having been members since 1995; 10 sites having been members since 1998; 5 sites having been members since 2000; 3 sites having been members since 2001; 3 sites having been members since 2002 (Career and Technical Education: High Schools That Work in Massachusetts: Directory, p. 1-4). This researcher tried to determine the efficacy of the High Schools That Work model in vocational-technical high schools in Massachusetts by comparing results between High Schools That work member sites (APPENDIX A) and non-High Schools That Work sites. (APPENDIX B) on the Failing category for English Language Arts and Mathematics on the Massachusetts Comprehensive Assessment System for school years 1999-2000, 2000-2001, and 2001-2002. The Massachusetts Comprehensive Assessment System is a high-stakes test, which every student in a Massachusetts public high school must pass in order to receive a high school diploma beginning with the graduating class of 2003. This research study also

compared and analyzed similar year data using the dropout rate as an indicator of efficacy because the assumption from various educators was that the dropout rate would skyrocket with the increase in standards tied to a high-stakes test. The study compared and analyzed the data from 15 of the earliest member sites with an equal number of vocational nonmember sites selected at random. The earliest member sites are listed in Appendix A, and the randomly selected sites are listed in Appendix B. The random selection was made using the random selection option in the Microsoft Excel Office 2000 software package. This researcher deleted the names of vocational-technical schools, which were members of the High Schools That Work network in Massachusetts from the list of 96 vocational schools listed in the Massachusetts Chapter 74 Vocational-Technical Education Directory before making the random selection.

This study compared and analyzed the results of learner outcomes in Massachusetts vocational-technical high schools by using the results in the Failing category from the Massachusetts Comprehensive Assessment System, which is a high-stakes test based on increased standards (The Massachusetts Frameworks). The study compared an equal number of Massachusetts vocational-technical high schools that are members of the High Schools That Work network with an equal number of those that are nonmembers. The study compared the Massachusetts Comprehensive Assessment System Failing category results in English Language Arts and Mathematics from 1999, 2000, 2001, and 2002 between High Schools That Work vocational-technical high schools in Massachusetts and non-High Schools That Work vocational-technical high schools in Massachusetts. Students not in the Failing category for English Language Arts and Mathematics would be eligible to receive a high school diploma, while those students

in the Failing categories would not be eligible to receive diplomas. The study also compared dropout rates between 1999, 2000, and 2001 to learn if increased standards and high-stakes testing have led to a significant increase in the dropout rate in High Schools That Work vocational-technical high schools in Massachusetts when compared to dropout rates in non-High Schools That Work vocational-technical high schools in Massachusetts.

The level of significance to decide whether to accept or reject the null hypothesis for increased dropout rates was $p \leq .05$. This researcher used the STATA statistical software package to analyze this data.

This study performed a two-sample t test with equal variances to learn if there was a statistically significant difference between the means of the dropout rates between the High Schools That Work sites and the non-High School That Work sites over 3 years.

The level of significance to decide whether to accept or reject the null hypothesis for the failure rates on the English Language Arts and Mathematics Massachusetts Comprehensive Assessment System was $p \leq .05$. This researcher used the STATA statistical software package to analyze this data.

This study performed a two-tailed t test with equal variances to learn if there was a statistically significant difference between the means of the failure rates in English Language Arts and Mathematics on the Massachusetts Comprehensive Assessment System between the High Schools That Work sites and the non-High Schools That Work sites over 4 years,

The results from this study will be shared by disseminating the study to the Southern Regional Education Board in Atlanta and the Massachusetts Department of

Education: School to Career cluster. It will also be made available to the schools, that are currently part of the High Schools That Work network in Massachusetts.

Cautions

A caution to this study is a heightened awareness of the data from the 1999-2000 Massachusetts Comprehensive Assessment System results because the diploma requirement for passage of the assessment begins with the Massachusetts graduating classes of 2003.

A second caution to this study is this researcher's involvement with the High Schools That Work initiative and his employment at a Massachusetts vocational-technical school, which is a member of the High Schools That Work network.

CHAPTER 4

FINDINGS OF THE RESEARCH

The review of the literature for this study has suggested that implementation of the High Schools That Work model should result in increased learner outcomes on high-standards, high-stakes assessments, and because of greater student engagement there should have been no significant increase in the student dropout rate over three years when compared to the dropout rate for non-High Schools That Work sites over three years.

The data in this chapter discusses the comparison rates over three years for student dropouts between 15 (n=15) of the Massachusetts vocational-technical high schools, which were members of the High Schools That Work network in 1998, 1999, and 2000 with a random selection of 15 (n=15) Massachusetts vocational high schools, which were not members of the High Schools That Work network. The comparisons made were based on the Massachusetts Comprehensive Assessment System results in the Failing categories for English Language Arts and Mathematics from 1999, 2000, 2001, and 2002 (TABLE 3, pg.70&TABLE 4, pg.71) and the dropout rates between 1999, 2000, and 2001 (TABLE 1, pg.68&Table 2, pg.69).

This researcher chose two disciplines for comparison from the Massachusetts Comprehensive Assessment System: English Language Arts and Mathematics, the two disciplines required for a diploma, beginning in 2003. If the High Schools That Work model was effective, then the data should have revealed a lower percentage of students in the High Schools That Work network in the Failing categories of the Massachusetts Comprehensive Assessment System for English Language Arts and Mathematics when compared to students in the non-High Schools That Work sites covering the years 1999,

200, 2001, and 2002.

The dropout rates (TABLE 1, pg.68) for the High Schools That Work sites should have shown no significant difference from 1999, 2000, and 2001 when compared with the dropout rates from the non-High Schools That Work sites (TABLE 2, pg.69). To statistically evaluate the difference, the average dropout rate over the three years was calculated for each school and then the differences between the High Schools That Work and non-High Schools That Work was evaluated.

Using the STATA statistical software package, this study used a two-tailed t test with equal variances to learn if there was a statistically significant difference between the means of the dropout rates over three years between the High Schools That Work sites and the non-High Schools That Work sites. The results showed $t=-1.1344$ and $p=0.2663$. The data did not illustrate any statistically significant differences in the dropout rates over three years between the High Schools That Work sites and the non-High Schools That Work sites.

TABLE 3 on page 70 shows the 15 Massachusetts vocational High Schools That Work sites along with their percentage results for the English Language Arts and Mathematics Massachusetts Comprehensive Assessment System for 1999, 2000, 2001, and 2002. TABLE 4 on page 71 shows the 15 Massachusetts non- High Schools That Work vocational sites along with their percentage results for the English Language Arts and Mathematics Massachusetts Comprehensive Assessment System for 1999, 2000, 2001, and 2002.

Using the STATA statistical software package, this study used a two-tailed t test with equal variances to learn if there was a statistically significant difference between the

means of the failing rate in Mathematics on the Massachusetts Comprehensive Assessment System between the High Schools That Work sites and the non-High Schools That Work sites over four years. Again, a mean score for all four years was calculated for each school for the statistical comparison with the results $t = 2.7818$ and $p=0.0096$. This data did illustrate a significantly lower failing rate in Mathematics on the Massachusetts Comprehensive Assessment System over four years for the High Schools That Work sites.

Using the STATA statistical software package, this study used a two-tailed t test with equal variances to learn if there was a statistically significant difference between the High Schools That Work sites and the non-High Schools That Work sites on the mean failing rates over the four years in English Language Arts on the Massachusetts Comprehensive Assessment System. An average failing rate for the four years was calculated for each school to complete this analysis. The results showed $t = 2.5945$ and $p=0.0149$. This data did illustrate a significantly lower failing rate in English Language Arts on the Massachusetts Comprehensive Assessment System over four years for the High Schools That Work sites.

These conclusions strongly suggest that the schools in the High Schools That Work network did better on the Massachusetts Comprehensive Assessment System than the non- High Schools That Work sites. The conclusions also suggest that the percentage of increase in dropout rates for the High Schools That Work sites when compared with the increase in dropout rates for non- High Schools That Work sites was not significant.

TABLE 1

HIGH SCHOOLS THAT WORK DROPOUT RATES		
School	Year	%
Blackstone Valley Regional Vocational Technical High School	1999	5.3
	2000	2.6
	2001	1
Greater New Bedford Regional Vocational Technical High School	1999	2.2
	2000	4.1
	2001	3.9
Minuteman Vocational Technical High School	1999	1.9
	2000	1.6
	2001	2.3
North High School	1999	8.6
	2000	7.5
	2001	9.2
Putnam Vocational-technical High School	1999	6.4
	2000	6.2
	2001	8.7
Quincy High School	1999	2
	2000	5.5
	2001	6.9
Salem High School	1999	3.8
	2000	2.2
	2001	2.8
Taconic High School	1999	3.9
	2000	4.3
	2001	6.1
Tri-County Regional Vocational Technical High School	1999	2.2
	2000	1.2
	2001	0.9
Westport Academy High School	1999	2
	2000	0.8
	2001	4.6
Chicopee Comprehensive High School	1999	2.2
	2000	9.2
	2001	6.7
Norfolk County Agricultural High School	1999	2.6
	2000	0.9
	2001	0
Silver Lake Regional High School	1999	1.3
	2000	1
	2001	2
Somerset High School	1999	1.3
	2000	2.7
	2001	2.6
Upper Cape Cod Vocational Regional High School	1999	4.5
	2000	2.2
	2001	2.3
Average 1999		3.34667
Average 2000		3.46667
Average 2001		3.59333

TABLE 2

NON-HIGH SCHOOLS THAT WORK DROPOUT RATES		
School	Year	%
Bay Path	1999	0.7
	2000	1.3
	2001	2.1
Whittier Regional Vocational High School	1999	2.2
	2000	1.6
	2001	2
Plymouth South High Tech	1999	3.3
	2000	3
	2001	2.2
Tantasqua Regional Vocational High School	1999	3.2
	2000	5.1
	2001	5.1
BMC Durfee (Fall River)	1999	5.2
	2000	6.9
	2001	6.9
Pathfinder Vocational Technical High School	1999	1.5
	2000	1.8
	2001	2.2
Essex Agriculture and Technical Institute	1999	1.8
	2000	2.6
	2001	2.4
Old Colony Vocational Technical High School	1999	1.7
	2000	0.7
	2001	2.2
Lynn Vocational Technical Institute	1999	3.3
	2000	3.8
	2001	3.6
Worcester Vocational High School	1999	4.3
	2000	5.4
	2001	5.4
South Middlesex Vocational Technical (Keefe)	1999	0.7
	2000	0.7
	2001	1.1
Greater Lawrence Regional Vocational Technical	1999	3.8
	2000	3
	2001	4.3
Greater Lowell Regional Vocational Technical	1999	1.6
	2000	1.9
	2001	1.9
Nashoba Valley Technical High School	1999	0.6
	2000	2.1
	2001	1.3
Montachusett Vocational Technical	1999	4.6
	2000	3.3
	2001	2.3
Average 1999		2.566666667
Average 2000		2.88
Average 2001		3

TABLE 3

High Schools That Work MCAS Scores			
School	Year	ELA % failing	MATH % failing
Blackstone Valley Regional Vocational Technical High School	1999	42	75
	2000	53	51
	2001	18	21
	2002	10	23
Greater New Bedford Regional Vocational Technical High School	1999	64	87
	2000	71	83
	2001	37	54
	2002	25	53
Minuteman Vocational Technical High School	1999	42	61
	2000	46	60
	2001	18	27
	2002	15	27
North High School	1999	55	76
	2000	52	67
	2001	25	36
	2002	26	43
Putnam Vocational Technical High School	1999	90	97
	2000	94	95
	2001	59	73
	2002	76	91
Quincy High School	1999	47	74
	2000	39	55
	2001	25	26
	2002	13	26
Salem High School	1999	41	60
	2000	31	50
	2001	26	33
	2002	15	29
Taconic High School	1999	29	51
	2000	38	48
	2001	17	23
	2002	11	17
Tri-County Regional Vocational Technical High School	1999	57	74
	2000	60	61
	2001	31	35
	2002	21	32
Westport Academy High School	1999	28	47
	2000	37	48
	2001	20	33
	2002	13	30
Chicopee Comprehensive High School	1999	47	71
	2000	59	67
	2001	27	36
	2002	10	24
Norfolk County Agricultural High School	1999	29	67
	2000	23	52
	2001	4	12
	2002	5	18
Silver Lake Regional High School	1999	21	41
	2000	24	36
	2001	6	14
	2002	8	16
Somerset High School	1999	35	55
	2000	23	38
	2001	10	15
	2002	6	17
Upper Cape Cod Regional Vocational Technical High School	1999	70	87
	2000	65	70
	2001	41	43
	2002	17	36
Average Failure Rate 1999		46.46666667	68.2
Average Failure Rate 2000		47.66666667	58.73333333
Average Failure Rate 2001		24.26666667	32.06666667
Average Failure Rate 2002		18.06666667	32.13333333

TABLE 4

Non-High Schools That Work MCAS Scores			
School	Year	ELA % failing	MATH % failing
Bay Path	1999	68	79
	2000	63	73
	2001	32	47
	2002	24	43
Whittier Regional Vocational High School	1999	70	92
	2000	76	87
	2001	47	67
	2002	30	57
Plymouth South High Tech	1999	64	77
	2000	47	63
	2001	41	42
	2002	22	41
Tantasqua Regional Vocational Technical High School	1999	61	79
	2000	64	62
	2001	30	26
	2002	15	20
BMC Durfee (Fall River)	1999	45	72
	2000	48	63
	2001	28	38
	2002	23	43
Pathfinder Vocational Technical High School	1999	59	80
	2000	63	78
	2001	20	31
	2002	24	38
Essex Agriculture & Technical Institute	1999	38	78
	2000	54	82
	2001	35	61
	2002	23	51
Old Colony Vocational Technical High School	1999	69	76
	2000	53	67
	2001	27	36
	2002	23	45
Lynn Vocational Technical Institute	1999	62	76
	2000	65	63
	2001	45	45
	2002	29	56
Worcester Vocational High School	1999	73	89
	2000	77	85
	2001	45	50
	2002	41	59
South Middlesex Vocational Technical (Keefe)	1999	75	85
	2000	75	85
	2001	46	70
	2002	41	62
Greater Lawrence Regional Vocational Technical	1999	76	92
	2000	73	85
	2001	55	71
	2002	46	62
Greater Lowell Vocational Technical High School	1999	71	90
	2000	70	79
	2001	48	63
	2002	27	38
Nashoba Valley Tech	1999	22	36
	2000	19	31
	2001	32	44
	2002	29	38
Montachusett Vocational Technical	1999	62	79
	2000	69	82
	2001	42	46
	2002	27	48
Average Failure Rate 1999		61	78.66666667
Average Failure Rate 2000		61.06667	72.33333333
Average Failure Rate 2001		38.2	49.13333333
Average Failure Rate 2002		28.26667	46.73333333

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Purpose and Rationale for this Study

The primary research question posed in this study was to determine the efficacy of the High Schools That Work whole-school reform model on learner outcomes in vocational-technical schools in Massachusetts on high-standards, high stakes testing by comparing the failing rates for students in English Language Arts and Mathematics on the Massachusetts Comprehensive Assessment System over four years. Based on the resultant data, the conclusion reached by this researcher is that High Schools That Work vocational high schools in Massachusetts had significantly lower failure rates on the Massachusetts Comprehensive Assessment System, a high stakes test in English Language Arts and Mathematics, aligned with the increased standards in the Massachusetts Frameworks and necessary for a diploma beginning with the graduating class of 2003. The data showed that non- High Schools That Work vocational high schools in Massachusetts had a significantly higher failure rate on the Massachusetts Comprehensive Assessment System in English Language Arts and Mathematics when compared with the High Schools That Work sites.

Another concern addressed by this researcher was the effect on dropout rates with the implementation of high-standards, high stakes testing such as the Massachusetts Comprehensive Assessment System. The data showed no significant differences in the increases in the dropout rates between the High Schools That Work sites when compared to the increases in the dropout rates for the non-High Schools That Work sites.

This researcher chose these research questions because various models for whole school reform, including High Schools That Work, have been introduced nationally since the advent of mandated increased standards for all students, and Massachusetts has made an investment of over \$3,118,000. in the High Schools That Work initiative. The number of High Schools That Work member sites in Massachusetts has continued to increase. Policy makers within the state of Massachusetts, who are accountable for the success of students in vocational-technical education, especially since the Massachusetts Frameworks and Massachusetts Comprehensive Assessment System, have remained concerned with a whole-school model for reform, to which they have committed both time and resources. Therefore, this researcher has arrived at the conclusion that the question of efficacy of the High Schools That Work whole-school reform model on learner outcomes on high-standards, high-stakes testing in Massachusetts vocational-technical high schools has been both purposeful and important in terms of research and study.

Methodology

This researcher used a method of comparative analysis for this study selecting 15 of the earliest High Schools That Work vocational high schools in Massachusetts for comparison with 15 non- High Schools That Work high schools in Massachusetts. The High Schools That Work sites were listed in the Massachusetts Department of Education's High Schools That Work Directory. The non- High Schools That Work sites were selected from the Massachusetts Department of Education's Chapter 74 Vocational Technical Education Directory. The non- High Schools That Work sites were selected at random using the random selection function found in Microsoft Excel in the Microsoft

Office 2000 Professional Version software. The non- High Schools That Work group served as a sample of the whole because of common identifiable characteristics. This researcher used the STATA statistical software package to determine the statistical significance of the failing rates over four years time between the High Schools That Work sites and the non-High Schools That Work sites in Massachusetts. This researcher also compared dropout rate percentages for High Schools That Work and non- High Schools That Work vocational-technical sites over three years time. This researcher used STATA to determine the statistical significance of the increases in dropout rates between the High Schools That Work sites and the non-High Schools That Work sites.

Findings

The data showed non-High Schools That Work sites had an average failing rate of 47.1 and High Schools That Work sites had an average failing rate of 34.1 ($t=2.5945$ $p=0.0149$). This data did illustrate a significantly lower failing rate in English Language Arts on the Massachusetts Comprehensive Assessment System over four years for the High Schools That Work sites when compared to the failing rate in English Language Arts over four years on the Massachusetts Comprehensive Assessment System for non-High Schools That Work sites.

The data showed non-High Schools That Work sites had an average failing rate of 61.7 and High Schools That Work sites had an average failing rate of 47.8 ($t=2.7818$, $p=0.0096$). This data did illustrate a significantly lower failing rate in Mathematics on the Massachusetts Comprehensive Assessment System over four years for the High Schools That Work sites when compared to the failing rates in Mathematics over four years on the Massachusetts Comprehensive Assessment System for non-High

Schools That Work sites.

The data showed non-High Schools That Work sites had an average drop-out rate of 2.8% and High Schools That Work sites had an average drop-out rate of 3.6% ($t=1.1344$, $p=0.2663$). The data did not illustrate any statistically significant differences in the dropout rates over three years between the High Schools That Work sites and the non-High Schools That Work sites.

Response to Research Question

The main purpose of this study was to try to determine the efficacy of the High Schools That Work school reform model on learner outcomes in the failing category for 15 vocational-technical high schools using high standards, high stakes assessments such as the Massachusetts Comprehensive Assessment System in English Language Arts and Mathematics. The study also tried to determine the efficacy of the High Schools That Work school reform model on student retention rates by comparing the dropout rates between 15 High Schools That Work vocational-technical schools in Massachusetts with the dropout rates of 15 randomly selected vocational-technical high schools in Massachusetts that are not members of the High Schools That Work network.

The research data showed significantly lower failure rates in English Language Arts and Mathematics on the Massachusetts Comprehensive Assessment System for the schools in the High Schools That Work network when compared to the failure rates in English Language Arts and Mathematics on the Massachusetts Comprehensive Assessment System for non-High Schools That Work sites over a four year period of time. The research data also showed that the percentage of increase in dropout rates for the High Schools That Work sites when compared with the increase in

dropout rates for non- High Schools That Work sites was not significant.

Conclusions

These data showed a significantly lower failure rate in English Language Arts and Mathematics on the Massachusetts Comprehensive Assessment System for the High Schools That Work sites when compared to the failure rates in English Language Arts and Mathematics on the Massachusetts Comprehensive Assessment System for non-High Schools That Work sites over four years time. This researcher has concluded that the High Schools That Work model has had a positive effect on learner outcomes on high-standards, high-stakes testing in vocational-technical schools in Massachusetts. This researcher has also conclude, based on the data, that the percentage of increase in dropout rates for the High Schools That Work sites when compared with the increase in dropout rates for non- High Schools That Work sites was not significant.

Implications for Further Research

This researcher believes that further research is needed to identify the efficacy of the High Schools That Work whole-school reform model on learner outcomes on high-standards, high-stakes testing of vocational-technical high school students in Massachusetts as compared to the efficacy on learner outcomes on high-standards, high-stakes testing of vocational-technical high school students in Massachusetts for other nationally recognized whole-school reform models, such as Career Pathways, which is also in place in some Massachusetts vocational-technical high schools.

This researcher believes that further research including additional sites over time would add to the knowledge of the efficacy of the High Schools That Work model for increasing learner outcomes on high-stakes testing aligned with increased standards.

This researcher believes that further research comparing learner outcomes on high-stakes testing aligned with increased standards in multiple states would increase the knowledge of the effectiveness of the High Schools That Work whole-school reform model as compared with other nationally recognized whole-school reform models.

Recommendations

This researcher makes the following recommendations pertaining to this study:

- The officials at the Massachusetts Department of Education's Career and Technical Education Program should encourage vocational-technical high schools in Massachusetts to continue their participation in the High Schools That Work network
- The officials at the Massachusetts Department of Education's Career and Technical Education Program should encourage additional vocational-technical high schools to participate in the High Schools That Work network
- To document the data and findings from this research and report them to the Massachusetts Commissioner of Education
- To document the data and findings from this research and report them to the Southern Regional Education Board, the parent of the High Schools That Work network.

APPENDIX A

A LIST OF 15 HIGH SCHOOLS THAT WORK VOCATIONAL HIGH SCHOOLS

Blackstone Valley Regional Vocational Technical High School

Greater New Bedford Regional Vocational Technical High School

Minuteman Vocational Technical High School

North High School

Putnam Vocational Technical High School

Quincy High School

Salem High School

Taconic High School

Tri-County Regional Vocational Technical High School

Westport Academy High School

Chicopee Comprehensive High School

Norfolk County Agricultural High School

Silver Lake Regional High School

Somerset High School

Upper Cape Regional Vocational Technical High School

APPENDIX B

A LIST OF 15 NON-HIGH SCHOOLS THAT WORK VOCATIONAL HIGH SCHOOLS

Bay Path High School

Whittier Regional Vocational High School

Plymouth South High Tech

Tantasqua Regional Vocational Technical High School

BMC Durfee (Fall River)

Pathfinder Vocational Technical High School

Essex Agriculture and Technical Institute

Old Colony Vocational Technical High School

Lynn Vocational Technical Institute

Worcester Vocational High School

South Middlesex Vocational Technical High School (Keefe)

Greater Lawrence Regional Vocational Technical High School

Greater Lowell Vocational Technical High School

Nashoba Valley Technical High School

Montachusett Vocational Technical High School

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