An Investigation of Curriculum Integration

In A Vocational School Setting: A Qualitative Study

A Doctoral Thesis

By

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Abstract

Employers are requiring that high schools give students the skills necessary for a changing 21st century global society. Entry-level employees are required to learn new skills quickly and to be able to communicate, solve problems, and work with technology. Twenty-first century skills need to be taught but schools also need to prepare students to pass state and national standardized tests at levels of proficiency and above. This current narrow focus on academic skills and student performance – primarily in reading and mathematics – as measured by standardized tests is affecting the curriculum in vocational schools. An important characteristic of vocational education is students’ vocational experience. In most vocational schools, a student’s day is spent in an integrated classroom experiencing learning in a vocation as well as learning in the typical academic disciplines taught in most high schools. In 1984, the Carl D. Perkins Vocational Education Act was founded and currently provides almost $1 billion a year to improve the quality of secondary and post-secondary schools. The question is how vocational schools can best meaningfully provide if not integrate vocational and academic learning. A qualitative study approach of a vocational/technical high school that attempts to relevantly integrate these two realms of learning was used to investigate this question. First person accounts, interviews, and observations were analyzed for common and discrepant themes across faculty in the school regarding these topics.

Keywords: curriculum integration, vocational education, career and technical education, 21st century skills, ACT
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A very special thanks to the man who sat side by side with me for the last four years of my life as a doctoral student, cheering me on. My husband, Dana Quinn, endured my sleepless nights, encouraged me to continue when each new advisor asked for a new beginning, and inspired me to complete my journey.
Chapter I: Introduction

Problem of Practice

The needs of our global society are changing and high schools must prepare students to meet these needs. New technologies and management skills require employees to have better communication skills, critical thinking skills and problem solving skills. Due to the No Child Left Behind Act (2001) and the focus on high stakes testing, career and technical schools have had to change their focus. With this shift in focus, students may be ready for college but are they ready for careers? It has been argued by many that twenty-first century skills need to be taught in schools throughout the United States (NACOL, 2006); schools also need to prepare students to pass state, and national standardized tests at levels of proficiency and above. This narrow focus on academic skills and student performance on standardized testing is affecting the curriculum in career and technical education schools. To prepare students for the perceived changing global landscape, some politicians, administrators, and educators have been discussing reshaping American schools, addressing these changes in terms of global education and 21st century skills (Williams, 2005). Corporations agree that 21st century skills curriculum should focus on those skills that will ensure a future global workforce (Spring, 2004).

One study found that 68% of all jobs in Massachusetts will require some form of higher education beyond high school. Massachusetts is a member of the Partnership for the Assessment of Readiness for College and Careers. In September of 2010, this group was awarded money from the U.S. Department of Education for the development of a K-12 assessment system that would be aligned to the Common Core State Standards in English Language Arts and mathematics. This assessment will be designed to measure not only students’ knowledge of the content but also, their ability to apply that content (Rennie Center, 2010).
Tomorrow’s workers will need to be able to engage in life-long education, learn new things quickly, perform more non-routine tasks and more complex problem solving, take on more decisions, understand more about what they are working on, require less supervision, assume more responsibilities, and as vital tools to those ends have better reading, quantitative reasoning, and expository skills (World Bank document quoted in Spring, 2004, p. 46). The World Bank statement mentions reading, quantitative, and expository skills as being vital tools to an end; this researcher interprets this to be creating more skilled workers who are also proficient in academics.

Other researchers are concerned about the insufficiency of the traditional schools. Price (2003) contends that the habits of mind, the “rituals” of a standards based education and high stakes testing are limiting our children in meeting the demands of the complex global environment (Price, 2003 p.727). He states that because of standards-based schooling and standardized testing

We teach our children: that complex problems have a limited number of solutions; to write, think, and question in specific limited ways; to answer questions humorlessly and to the point; that diversity of thought must give way to authoritarianism; to disengage from tangents; that learning is something we do for tests; (and) to suppress their own analysis for that of the testing authority (Price, 2003, p.727).

Many researchers are asking for changes in schools through a focus on a 21st century skill curriculum. Corporations would like to see the global society drive the curriculum for the educational institutions (Partnership for 21st Century Skills, 2011). These corporations such as Apple, McGraw Hill, and Legos have had influence in creating 21st century curriculum. Since backed by corporations the interest focuses on adaptability, problem solving, and creating life-
long learners who are able to keep pace with a rapidly changing corporate environment. For example, the “Partnership for 21st Century Skills,” an organization that includes many business partners including, Educational Testing Service, Microsoft, Cable in the Classroom, Dell Inc., and Cisco Systems, states “U.S. Schools must align classroom environments with real world environments by infusing 21st century skills. This skill set includes:

- Information and communication skills
- Thinking and problem solving
- Interpersonal and self-direction skills
- Global awareness

One of the basic fundamentals of high school is to prepare students to lead productive and prosperous lives. For the past few centuries, the United States has succeeded in this goal. At the close of the first decade in the 21st century, the United States has fallen behind. There seems to be a skills gap in which many students are lacking the skills to compete for 21st century jobs (Wagner, 2008). College readiness alone is not enough. The problem may be a lack of integration between school and career. The purpose of this investigation is to explore the process of integrating academic and vocational studies to see whether or not students at a career and technical high school in New England are being taught skills for a 21st century workforce.

**Significance in Current Practice**

The Partnership for 21st Century Skills stated in their 2011 report that locally, career and technical education is succeeding in Massachusetts, training young people for a wide range of careers. Many students go right from school to work, while others go on to a two- or four-year
college program before entering the workforce. Career and technical education expands, rather than limits, a student's career opportunities. Learning is applied, not theoretical, helping students see the relevance of their courses to their future success. Education experts say public schools today must teach students 21st century skills to prepare them to compete in a global economy (Partnership for 21st Century Skills, 2011). Beyond basic academics, 21st century skills include the ability to work in teams, to think critically and solve problems, to use technology and to be able to communicate effectively across many media. These skills are most effectively taught through project-based learning, with clear accountability standards and opportunities for students to become proficient in their leadership and communication skills. “Today’s life and work environments require far more than thinking skills and content knowledge. The ability to navigate the complex life and work environments in the globally competitive information age requires students to pay rigorous attention to developing adequate life and career skills” (Partnership 2011).

Ideas and training needs will be shared among schools. The Massachusetts Association of Vocational Administrators (MAVA) represents the interests of vocational technical educators and administrators from public high schools throughout the commonwealth. MAVA is a professional association of educational leaders who administer career and technical programs in Massachusetts schools. Their mission statement includes the following goals:

- To support a performance-based delivery model that results in academic and technical proficiency for all students
- To improve instruction through experiential learning that integrates both academic and career and technical performance standards
- To provide professional development activities that support career and technical educators, honor accomplishments, and advance professional and organizational leadership goals
- To advocate for career and technical education that is respected and valued, aligned to industry standards, and relevant to the needs of students

This information will be shared with MAVA and will be helpful in the practice of writing integrated curriculum. These integrated units may be shared through a new vocational online consortium that we are in the process of developing. The vocational and academic staff from many Career and Technical Education schools will be able to work together to teach students what is needed in a 21st century world.

This researcher will now review how this study will inform research and policy. In their report on College Readiness: Crisis at the Core, ACT shows that students are not ready for work. ACT is an independent, not-for-profit organization that provides many types of assessment, research, information, and program management solutions in the areas of education and workforce development. This organization has shown that students are lacking skills in critical thinking and problem-solving, collaboration, agility and adaptability, initiative and entrepreneurialism, effective oral and written communication, accessing and analyzing information, curiosity and imagination (ACT, 2005). As stated in their report on College Readiness, “Our nation’s social and economic future depends on our ability to increase the percentage of students who leave high school ready for college and work” (ACT, 2005, p. 1). They have found that more than one-quarter of first-year students at four-year colleges and almost half of those in community colleges do not return for a second year, stating that “These students end up unprepared for the future, especially for the lifelong learning required for high
performance, high-wage jobs” (ACT, 2005, p. XX). President Obama stated in a recent State of the Union address, "If we want to win the future - if we want innovation to produce jobs in America - then we also have to win the race to educate our kids" (Center for American Progress, 2011).

The National Association of Manufacturers (NAM, 2005) has conducted many surveys over the years and the results show that 78% of respondents believe public schools are failing to prepare students for the workplace despite a decade of various education reform movements. Companies responding to the survey said that the biggest deficiency of public schools is not teaching basic academic and employability skills (National Association of Manufacturers, 2005).

The United States is competing more than ever in a global economy that not only requires but demands innovation in order to produce jobs. To remain competitive in the world, we must ensure that our students are ready to succeed both in the jobs of today and that they are prepared for the jobs of the future, many of which haven't even been created yet. Most major corporations are looking for entry-level workers who can communicate, solve problems, work with technology, and learn quickly (Perry, 1989).

Research has shown that there is disagreement on curriculum reform concerning integration. Interviews done by Hargreaves, Earl, Moore and Manning (2001) reveal that some teachers misunderstand the term integration. They believe integration means combining two disciplines only, for example, math and science. These teachers are subject oriented and do not understand the trans-disciplinary approach to curriculum integration that begins from a real life concept.

Before the era of high stakes testing, career and technical schools focused mainly on career and life skills. With the advent of tests such as the MCAS, which is the Commonwealth's
statewide standards-based assessment program developed in 1993, these schools were forced to shift their focus to academic excellence. State and federal law mandates that all students who are enrolled in the tested grades and who are educated with Massachusetts public funds participate in MCAS testing (Mass.gov 2008). MCAS has three primary purposes: (1) to inform and improve curriculum and instruction; (2) to evaluate student, school, and district performance according to Massachusetts Curriculum Framework content standards and Performance Standards; and (3) to determine student eligibility for the Competency Determination requirement in order to award high school diplomas (Mass.gov 2008). Career and life skills are missing. The theory behind my research is to show how important career and life skills are and how the focus of all schools should also include: communication skills, critical thinking skills and problem solving skills.

Currently, the United States is looking to increase academic rigor and follow nationally based standards (common core standards) that all schools must adhere to. The Common Core State Standards Initiative is a U.S. education initiative that follows the principles of standards-based education reform (CCSSO, 2009). Massachusetts is on board. The common core standards are designed to be rigorous and relevant to the real world, reflecting the knowledge and skills that our students need for success in college and careers. The hope is that American students will be fully prepared for the future and will be able to compete successfully in a global economy. Schools must adapt to economic changes, stay focused on assessment-driven growth, and diversify instructional methods and pedagogy to include school and career readiness skills. It is the educational leaders who must accept the responsibility for preparing students for a changing global society. This researcher’s study will help determine if this New England career and technical high school is adhering to the common core standards through curriculum integration and succeeding in preparing students for their future. Curricula for courses may need to be
changed to reflect curriculum integration. Assessment and evaluation of both students and teachers may also need to be changed to include the topic of curriculum integration.

To summarize, research shows that students are graduating from high school not prepared for the work force. Curriculum integration is seen as a solution to this problem. Reviewing the literature on integration has led this researcher to want to find out how curriculum integration is approached at my school. Curriculum integration will be defined by my research as curriculum that begins with problems, issues and concerns posed by life itself (Beane, 1995). This researcher’s qualitative study is significant because it will add to the research of career and technical education meeting the needs of a 21st century workforce through integration. This study will contribute to the research done on integration of academic and vocational studies and the need for more teacher-training in curriculum integration.

The purpose of this study is to investigate how a career and technical high school in New England is attempting to integrate both academic and vocational skills to meet the needs of a 21st century society. The findings of this study may help to inform professional development and teaching practices for teachers and administrators in other schools. It may also help to inform policy for new curriculum. As schools begin to rewrite our state frameworks to include national standards, the results found in this study could be useful.

Research Question

The primary research question is: How are career and technical high school teachers integrating academic and vocational education in a vocational technical high school in New England with attention to the need to develop 21st century skills in their students? The purpose of this qualitative study is to investigate how teachers of a career and technical high school in
New England are, or are not, integrating academic and vocational technical learning with attention to the development of students’ 21st century skills

Summary of Thesis Organization

This thesis will provide a theoretical framework in support of the investigations which includes a discussion of the theory of curriculum integration. This will be followed by the literature review which includes relevant literature as it pertains to career and technical high schools as well as the literature on the history of changes to career and technical educational caused by educational reform. Following this literature review, this researcher proposes a research design, in the form of a qualitative study, to explore how one career and technical high school in New England has been affected by the changes mentioned above. The final discussion will review the limitations of this study as well as the precautions taken to protect study participants.

Theoretical Framework

The theoretical framework that informs this researcher’s proposed study is curriculum integration theory. A basic definition is offered by Humphreys (1981) when he states, "An integrated study is one in which children broadly explore knowledge in various subjects related to certain aspects of their environment" (p. 11). Dressel's definition goes further: “In the integrative curriculum, the planned learning experiences not only provide the learners with a unified view of commonly held knowledge (by learning the models, systems, and structures of the culture) but also motivate and develop learners' power to perceive new relationships and thus to create new models, systems, and structures” (1958, pp. 3-25). James Beane states that, “Curriculum integration begins with the idea that the sources of curriculum ought to be problems, issues, and concerns posed by life itself.” He believes that two of the primary goals of
curriculum integration are social integration and the democratization of the classroom. Students have a chance to begin building a real sense of community when they engage in addressing shared questions and concerns. While room is left for individualism in the project-based format, the emphasis is on commonality – on diverse students finding consensus in a set of themes for investigation.

All three definitions support the idea that an integrated curriculum is an educational approach that prepares children for lifelong learning. Career and technical education does this by integrating academic core subjects with vocational majors. In general, all of the definitions of integrated curriculum include:

- A combination of subjects
- An emphasis on projects
- Sources that go beyond textbooks
- Relationships among concepts
- Thematic units as organizing principles
- Flexible schedules
- Flexible student groupings.

In sum, curriculum integration means that students learn by connecting new information to familiar information, which is usually organized by individuals, not separated into disciplines (Beane, 1997). He states that in curriculum integration, knowledge from the disciplines is repositioned into the context of the theme, questions, and activities at hand. Even when teaching and learning move into discipline-based instruction, the theme continues to provide the context and the motivation. Here is when knowledge comes to life, has meaning, and is more likely to be "learned." Particular knowledge is not abstracted or fragmented, as is the case when taught
within a discipline or school subject area. Learning is also social and it requires watching and interacting with others first. Relevance is a critical part for most learners: students need to see something useful in new information before they are willing to expend the energy to integrate new information with existing knowledge (Beane, 1997). Curricula are student-centered (Klein, 2006).

Figure 1. This concept map was developed by Beane (1997).

Beane states that curriculum integration is a design that concerns itself with enhancing the possibilities for personal and social integration through organizing curriculum around significant problems and issues collaboratively decided upon by students and teachers without regard to subject areas. Beane believes that students bring four kinds of knowledge to the theme-building process:

1. Personal – which address the self-concerns of students
2. Social – which addresses societal and world issues
3. Explanatory – whose content names, describes, explains, and interprets
4. Technical – which are ways of investigating, communicating, analyzing, and expressing

Curriculum themes. Beane states that the goal in the classroom would be for students to work together to decide on important themes of study. This curriculum would blend traditional information with real life issues. Students would work in cooperative groups that foster a sense of community. Diversity and respect for human dignity should be emphasized at all times.

Curriculum themes are built from significant problems and issues identified by students along with their educators, without regard to subject titles, i.e. math, English, social studies, science, etc. Students would learn theme content and skills and apply them to self/personal concerns or social concerns. The term "integrative" is used to describe this style of learning (Beane, 1997). Curriculum used for integration is known as "thematic curriculum" because it does not defer to separate subject curriculum but expands upon it. Topics are chosen collaboratively and considered from many other subject viewpoints. Themes can be as simple as “Colonial Living" or the "Middle Ages," but also more involved like "Metrics," "Technology," or "Myths and Legends".

Examples of themes that relate to social issues or problems are "Conflict", "The Environment", "The Future" or "Prejudice". In an integrated classroom these issues would be learned on a local level and also on a global level. For example the theme of “Conflict” might have emerged because students were asking questions about war in Afghanistan. Maybe their relatives are serving overseas. Or others may have heard about a gang issue or a missing child on the news. Beane (1997) states that even though these themes may have traditionally been taught
in a social studies course, they are more thoroughly studied and understood when taught using content and skills from many disciplines.

**Knowledge.** In Beane’s model of curriculum integration the scope and sequence of knowledge is determined collaboratively by the students and teachers concerning their questions and concerns. Knowledge is used for problem solving purposes. Students use previous knowledge and experiences as their foundation as they explore new dimensions of learning. Students would ‘perform knowledge’ by social actions or presentations. Instead of approaching learning through separate subjects which distances it from everyday life, the pursuit of knowledge uses what the students already know from experience and popular culture, and combines it with what books and teachers have to offer.

**Concepts.** When confronted with a problem, people do not ask themselves which part of this problem is math, or art, or history. People reflect on knowledge that they have experienced without regard to subject area. Beane believes that concepts should be constructed from students own experiences and that students learn and retain information by reflecting on these experiences. The knowledge gained from such reflection can be used in future problems. Though students come from very diverse backgrounds and characteristics, curriculum integration can promote a sense of common values. Students bring diversity and their own frame of reference to a shared democratic learning process (Beane 1997). He states that students learn to respect diversity and human dignity, discovering each other’s strengths as they work together to solve a problem. Curriculum integration offers students the opportunity to learn the skills necessary to be part of a democracy. Students learn how to ask big questions and how to work cooperatively to find real answers (Erickson 1995). Beane (1997) believes that schools have an obligation to
promote democratic social integration. The classroom should be based on democracy, diversity and equality.

**Self/Personal Concerns and Social/World Concerns.** Students’ personal concerns can be sources of themes, i.e. “Getting Along With Peers”, "Living in our School", "Jobs and Careers" or "Who Am I?” To be a true integrated curriculum though, topics should relate to world concerns. Teachers should “draw themes from social issues and personal concerns since they emerge from real-life issues, offer powerful, significant, and relevant contexts for learning, and offer possibilities for introducing students to democratic problem-solving and constructivist uses of knowledge” (Beane 1997). Students participating in curriculum planning follow the democratic concept of participatory, collaborative governance and decision making. Including personal issues alongside social problems follows the democratic idea of integrating personal and social ideas (Beane, 1997).

According to Beane, integration is around us everywhere in society and in nature. Most jobs require the integration of a range of skills. In today’s workforce, people are given a problem and asked to solve it, usually without direct instruction. The “test” is whether or not the problem gets solved. This researcher sees curriculum integration theory as the framework for career and technical schooling. Problem-based learning taught through integration of academic and vocational studies is apparent in many CTE (career and technical education) classrooms, including specific math lessons with manipulatives, hands on science experiments, and related academics in shop classes. The Education Reform Act of 1993 required the Department of Education to develop the Certificate of Occupational Proficiency (COP) (Mass.gov, 2008). In addition to satisfying the competency requirements by passing the MCAS exam, students from a career and technical-technical school will also be evaluated on a proficiency evaluation which
indicates the level of competency they have attained at specific tasks in a Chapter 74 approved program. The COP’s are being developed by committees of people from business and industry who have a practice of hiring our students, vocational-technical educators in a Chapter 74 program, and a Department of Education facilitator.

Looking at career and technical education through an integration lens, this researcher plans to uncover how teachers are teaching abstract academic concepts through concrete, real-life examples. There are many benefits to integration. Students are more motivated to learn when they see the relevancy of their academic subjects in their career and technical majors. Teachers will benefit from teaching an integrated curriculum because their students will be more focused on a curriculum that they see the relevance of; that which has more personal meaning for their lives. Employers look to schools to produce a qualified work force. They need graduates who not only can accomplish discrete tasks but who have problem-solving skills that allow them to be flexible when carrying out aspects of their jobs. Students who complete integrated education programs are most likely to meet current and future employer needs. Stasz, Kaganoff, and Eden (1994) noted that career and technical teachers see integration as a means to improve the academic content of vocational courses and to help students prepare for a changing workplace.

Dare (2000) states that few studies have offered substantial empirical evidence of the effects of integrated academics on student learning and of ways in which applied academics benefit learners. Are students in integrated programs performing better than students in schools where subjects are taught separately? In a literature review that was conducted in the early 1990’s, Vars (1991) found that more than 80 normative or comparative studies had reported that students in various forms of integrated programs performed better than, or at least as well, on standardized achievement tests as students enrolled in separate subjects. In opposition, Marsh
(1993) collected some of the major research on integration from the US, UK, and Asia over the previous 50 years and found that there was little evidence of a either a positive or a negative nature. Other empirical studies show that some students learn science and mathematics concepts more favorably in integrated contexts, while other students have a much more difficult time (Richie & Hampson, 1996; Wicklein & Schell, 1997).

The most important outcome of the curriculum integration theory approach is the mindset in the educational community that we need to develop students prepared to meet the challenges of today’s world. This theory helps us as educators, to understand that our responsibility is to develop young minds that can think and analyze when confronted with a problem, not just answer abstract questions (Kolb, 1984). Educators who use problem-based learning recognize that in the world outside of school, adults build their knowledge and skills as they solve a real problem or answer an important question - not through abstract exercises. The best teachers combine their lessons with a problem based approach to the learning skills. The skills that they are imparting to their students are lifelong skills, not just classroom skills.

Fogarty (1991) has described ten levels of curricula integration. The following chart summarizes some of her work.

Figure 2.
Grubb et al. (1991) proposed that integration of academic content into vocational curricula provided both the academic and vocational needs of students. After much observation at schools,
across the country, Grubb et al. (1991) created models that represent a continuum of curriculum integration efforts:

Table 1

<table>
<thead>
<tr>
<th>Model</th>
<th>Type</th>
<th>Curriculum Changes</th>
<th>Teacher Changes</th>
<th>Students Targeted</th>
<th>Institutional Changes</th>
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<tbody>
<tr>
<td>1</td>
<td>Incorporating More Academic Content in Vocational Courses</td>
<td>Vocational courses include more academic content.</td>
<td>Vocational teachers modify courses.</td>
<td>Vocational students.</td>
<td>None</td>
</tr>
<tr>
<td>2</td>
<td>Combining Vocational and Academic Teachers to Incorporate Academic Content in Vocational Programs</td>
<td>Vocational programs include more academic content, in either vocational courses or related applied courses.</td>
<td>Academic teachers cooperate with vocational teachers.</td>
<td>Vocational students.</td>
<td>None</td>
</tr>
<tr>
<td>3</td>
<td>Making Academic Courses More Vocationally Relevant</td>
<td>Academic courses include more vocational content; sometimes new courses (e.g., applied academics) are adopted.</td>
<td>Academic teachers (usually) modify courses or adopt new ones. courses include more vocational content; sometimes new courses (e.g., applied academics) are adopted.</td>
<td>Potentially all students; in practice, vocational and general-track students.</td>
<td>None</td>
</tr>
<tr>
<td>4</td>
<td>Curricular Alignment: Horizontal and Vertical</td>
<td>Both vocational and academic courses are modified and coordinated across courses and/or over time.</td>
<td>Vocational and academic teachers cooperate; numbers range from two to all.</td>
<td>Potentially all students; actual targets vary.</td>
<td>None necessary; curriculum teams may foster cooperation.</td>
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Applied academics include curriculum integration and refer to a variety of curricula, pedagogies, and methods. Applied academics focus on academics, and offer students relevance which may increase their engagement and achievement (Shields, 1997). Hull and Parnell (1991) described applied academics as the blending of “head skill” and “hand skill” (p. 70).

Another study done by the Association for Supervision and Curriculum Development (ASCD) offered the following definition for integration: Integration is a philosophy of teaching in which content is drawn from several subject areas to focus on a particular topic or theme.
Rather than studying math or social studies in isolation, for example, a class might study a unit called The Sea, using math to calculate pressure at certain depths and social studies to understand why coastal and inland populations have different livelihoods (ASCD, 2003). Specialized career academies use this coordinated approach.

Strong proponents of integrated curriculum from the University of California at Berkeley are W. Norton Grubb, Gary Davis and Jeannie Lum. They believe in education through occupation. Michael Wonacott is a leader in the area of career and technical education. He has written many articles concerning the changes in career and technical education supporting John Dewey and the father of U.S. vocational education, Charles A. Prosser, who was the first Federal Commissioner of vocational education. In 1916 John Dewey wrote in his book Democracy and Education that education needed to be practical and meaningful. He believed that a divided system would reinforce class differences and add to the stratification of society. Dewey argued against two separate education systems. He believed that practical experience is crucial to a student’s education and his ideas influenced the first thirty-five years of education in the 20th century (Wirth, 1972).

According to a study done by Erickson (1995), integrated curriculum takes thinking to levels of analysis, synthesis, and evaluation and should be used to help students understand concepts, problems, or issues from multiple perspectives, applying what they learn to real-world problem solving (p. 142). Many suggestions have been given as integration models for career and technical schools. Lynch (2000) describes a “new vision” for career and technical education. Four major themes were proposed:

(a) Infuse career planning and development activities throughout the education process
(b) Embed career and technical education reform within the broad context of general education reform.

(c) Develop contemporary programs based on the needs of business and industry.

(d) Institute a K-14 education model where all students are prepared for postsecondary education.

Research has shown that one of the primary claims of career and technical education (CTE) is that relevance facilitates learning. The National Research Center for Career and Technical Education has studied this claim while researching curriculum integration in CTE schools. They list four main themes that described their findings: “students desired a utility value in their strategy use; students understood the importance of reading to their career; students engaged in reading if they could apply the information; and students desired a social aspect to reading to foster motivation” (NRCCTE, 2010). They found that learners learn best things of importance to them. “For example, students enjoy (or at least show less resistance to) reading articles or manuals that relate to their career choice …they understand the immediate benefit of reading instructions before attempting a task in the workshop” (NRCCTE, 2010).

Working at a career and technical high school has afforded this researcher many opportunities that may have been missed working at a comprehensive high school. Students learn the application of academic subjects through their vocational studies. “Meaning is essential to student success” (Fullan 2007, p. 170). John Dewey, an educational philosopher who was a strong proponent of ‘learning by doing’, believed that the principle goal of public education was to meet individual needs for personal fulfillment and preparation for life (Miller & Gregson, 1999). Educators should be responsible for providing students with experiences that are immediately valuable and which better enable the students to contribute to society. Dewey
believed that one does not learn solely through memorization of theories and facts, but through experience. He felt that greater emphasis should be placed on the broadening of intellect and development of problem solving and critical thinking skills, rather than simply the memorization of lessons (Dewey 1997). John Dewey felt that curriculum should be designed so that students could be educated through the occupations rather than for the occupations. School should be an active community with occupations that mirror the larger society.

Curriculum integration theory will serve as the lens for this researcher to better understand how teachers are integrating academic and vocational curricula. Students in a career and technical setting have opportunities to learn academic subjects by watching how knowledge is applied in the real world. Most of each career and technical student’s day is spent in integrated classrooms learning through hands-on classes that connect to their career interests. This researcher will be asking how this is done. Contextual learning leading to higher order thinking and problem solving skills is the focus of career and technical education (Parnell, 1999). The ability for an individual to problem-solve and use higher-order thinking skills in academic and professional settings may enable them to adapt to the changing global environment (Friedman, 2006). This researcher will explore how one New England career and technical high school uses curriculum integration daily to impart 21st century skills and prepare students for successful futures.

Chapter II: Literature Review

The purpose of this chapter is threefold: one, to explore vocational schools – past and present; two, to explore the press for vocational schools to focus on academics; and three, to explore the press for vocational schools to focus on 21st century skills.
When employing teenagers, the employers’ major complaints are that schools are delivering workers who lack problem-solving abilities, higher-order thinking skills, and communication/employability skills--all crucial for work in a global economy (Grubb, Davis, Lum, Plihal, and Morgain, 1991). Employers are not satisfied with the level of high school graduates' employability skills (e.g., Goldberger & Kazis, 1996; ACT Center for Education and Work, 1995; Secretary’s Commission on Achieving Necessary Skills [SCANS] 1991). There is a growing body of evidence that demonstrates the effectiveness of offering a rigorous college preparatory curriculum in a career-themed environment. Research shows that it is important to prepare students to succeed in college and career, not one or the other. An assumption is made that almost all students will eventually end up in the workplace and that most workers will need to learn advanced knowledge and skills to sustain or advance their careers.

**Guiding Question: How have vocational schools changed and why?** In the late 1800s, academics were taught separate from vocational skills. In 1892, Jones Academy was founded near Hartshorne, Oklahoma. For the first time, this academy offered agriculture, industrial, and domestic instruction separate from the academic curriculum. It was not until the Carl D. Perkins Vocational Technical Act of 1984 that a change to include preparing students for both work and college was seen. In the last one hundred years, there has been a shift in how people are employed in the United States. In the early 1900’s, agriculture was the primary employer with 87 percent of people employed on farms. Today, only three percent of the population works on farms. Most employees work in industries, factories and offices. The United States has gone from an agricultural society, to an industrial society, and finally to a post-industrial society. There is now a demand for different types of work skills. We are now in an information based
economy where people need higher academic skills to be able to read, communicate, and process information.

Historically, the career and technical school mission was to prepare students for entry-level work. Public funding for career and technical education was granted through federal legislation with the passage of the Smith Hughes Act in 1917. The next significant piece of federal legislation passed was the Vocational Education Act of 1963, which was designed to provide access to everyone while addressing the economic and social demands of America. This act was amended in 1968 and then again in 1976. These amendments stated that funds could be used for: (1) high school and postsecondary students, (2) students who had completed or left high school, (3) individuals in the labor market in need of retraining, (4) individuals with academic, socioeconomic, or other obstacles, (5) individuals that were considered mentally retarded, deaf, or otherwise disabled, (6) construction of area career and technical schools facilities, (7) vocational guidance, and (8) training and ancillary services such as program evaluations and teacher education (Gordon, 2003). The US was falling behind other nations in its ability to compete in a global workplace so the Carl D. Perkins Vocational and Applied Technology Act of 1990 was passed. This act was intended to strengthen the workforce preparation process. This included integration of academics and career and technical education, alliances between education and the workforce (including tech-prep) and closer linkages between school and work (Gordan, 2003). Next passed was the Carl D. Perkins Act of 1998 which called for a state performance accountability system in which the objective was to promote academic and technical performance, integration of academics in career and technical education, as well as postsecondary placement of students.
Guiding Question: How has Educational Reform changed CTE schools? The No Child Left Behind Act (NCLB) of 2001 was the government’s attempt to support standards-based education and was based on the premise that setting high standards and establishing measurable goals can improve individual outcomes in education. The Act required states to develop assessments in basic skills. Massachusetts answer is the Massachusetts Comprehensive Assessment System (MCAS) which has changed the focus of career and technical schools.

By 2004, states were becoming increasingly aware that their high schools, which had changed little since the mid-20th century, were not producing the 21st-century graduates needed to compete and succeed after high school in an increasingly complex and interconnected world (Achieve, 2004). There was a gap between what students knew leaving high school and the actual knowledge and skills they needed to be successful in college and careers. This study believed that all students needed additional education and training beyond high school, whether that meant a university, a community college, or technical training to succeed. Lewis agreed and stated that to produce higher achievement following high school completion academic components must be strengthened through correlation with vocational relevance.

In one study, it was found that for the past two decades of educational reform, high school students have not acquired the literacy and mathematical skills necessary for the United States to remain competitive in the world economy (Johnson, 2003). This researcher found that students could not qualify for jobs that would pay enough to support a family (Johnson, 2003). This deficiency was also expressed in a report from ACT (2004) who found that too few students of the graduating class of 2004 were ready for college-level work in English, math, or science. These students were not ready for the workplace, where the same skills were now being expected of those who did not attend college.
The latest revision, the Carl D. Perkins Career and Technical Education Improvement Act of 2006, was signed into law with the intention of strengthening the focus on responsiveness to the economy; while tightening up the accountability statement in regards to the integration of academics and technical standards. Carl D. Perkins CTE Improvement Act aims to increase the quality of technical education within the United States in order to help the economy. Highlights of the changes include: using the term career and technical education instead of vocational education; a focus on integrating academic and vocational studies; and an emphasis on providing all students with an education that will help them in the workplace and in life. Perkins has demanded reform and professional development for teachers is needed, especially in creating curricula that incorporate state and industry standards, but also academic skills to better prepare students for the 21st century workplace and for postsecondary education (Sturko and Gregson, 2009).

The new direction for career and technical education for the 21st century is geared toward a school that is academically rigorous and career relevant. These schools should provide career exploration and planning; enhanced academic achievement and motivation to learn; help students acquire skills for employment; and establish pathways for future education and lifelong learning (Lynch, 2000). The United States is looking to increase academic rigor and follow nationally based standards (common core standards) that all schools must adhere to. The Common Core State Standards Initiative is a U.S. education initiative that follows the principles of standards-based education reform (CCSSO, 2009).

Guiding Question: What does prior research say about 21st century skills? Schools and businesses have formed partnerships since the 1700’s. The goal of developing partnerships is to provide students with practical experience and curriculum development in school, while
helping the business community develop its future workforce. Formal legislation to encourage these partnerships was not developed until the late 20th century. Recent changes in educational reform, such as the Carl D. Perkins Vocational Technical Education Act of 1998 and its 2006 re-authorization, have added an additional challenge to schools to prepare all career and technical students for work and post-secondary education (Silverberg, Warner, Fong, and Goodwin 2004).

Even with these federal mandates, recent studies have revealed that students are graduating from high schools underprepared for the working world of the 21st century (Achieve, 2005; Partnership for 21st Century Skills, 2006). Achieve (2005) found that almost 40 percent of recent high school graduates reported that there were gaps between what they learned in high school and the skills they needed after high school. Employers are not satisfied with the level of high school graduates' employability skills (e.g., Goldberger & Kazis, 1996; ACT Center for Education and Work, 1995; Secretary’s Commission on Achieving Necessary Skills [SCANS], 1991).

The need for trained technical workers is rising, according to the latest job-outlook research report from the U.S. Bureau of Labor Statistics. Over the next few years there will be more machinist jobs than skilled workers available. Employers say they already have a hard time finding adequately skilled auto technicians and mechanics -- jobs expected to increase by about 110,000 by 2016. In June of 2007, Massachusetts began a Commonwealth Readiness Project that provides an action plan for the next decade to provide high quality public education for all residents (Route 21 Massachusetts). Part of this initiative is to focus on helping students understand what is needed in a 21st century world by connecting them with members of the business community. This project found that teaching students 21st century skills is important to the country’s economic success, therefore people will need training in what these skills are and
how to teach them. Opportunities for challenging careers and good salaries are changing the demographics of CTE students. Some programs such as Tech Prep and High Schools that Work are academically rigorous and offer vocational programs that can provide students with a jump start on college and careers (Ries, 2000).

After reviewing the effects of educational reform on CTE schools, it appears that students graduating from these schools are not as prepared as they should be for their futures. Resnick and Wirt (1996) believe that integration is one solution. Integration is one response to the increasingly technical nature of many jobs, which require a workforce comprised of skilled problem-solvers with strong applied academic preparation (Resnick & Wirt, 1996; history of CTE Stasz, Kaganoff, & Eden, 1994; Stern, Finkelstein, Stone, Latting, & Dornsife, 1994). If schools reform traditional academic and vocational curricula through integration, many argue that schools can increase student engagement, persistence, and learning at the secondary level and facilitate student transitions to postsecondary education and careers (Grubb, Davis, Lum, Plihal, & Morgaine, 1991; Resnick & Wirt, 1996; Stasz et al.; Stern et al.) Stasz et al. (1994) concluded that there may be benefits for students, educational systems, and employers by the integrating of curricula and other school-to-career initiatives (Eisenman. Hill, Bailey, Dickison, 2003).

Integration engages students in work where disciplinary knowledge is built through real and substantive material. The intellectual quality is created because students are encouraged to study material in deeper and more connected ways than learning just for schools' sake (Brown, Collins, & Duguid, 1989). Julius Ayo Akinwumiju (2010) stated that an integrated curriculum is an educational approach that prepares children for lifelong learning. In his study he found that those who support curriculum integration believe that schools must look at education as a
process for developing abilities required by life in the twenty-first century, rather than discrete, departmentalized subject matter (Akinwumiju, 2010). His findings showed that in one math class, for the gifted students, who by nature may want to know why things are happening and how formulas or equations develop, integration enabled them to get deeper into the mathematics. For the lower-level students who needed a hands-on approach, integration allowed them to work with real-life problems in mathematics which better served their needs. Wolf & Brandt (1998) found that one of the best ways to promote problem solving is through an enriched environment that makes connections among several disciplines. Leonardo (2004) argued that integrated approaches to school better reflect the realities of students’ experiences outside school. Integrated approaches to curriculum enable teachers and students to go beyond the strict disciplinary boundaries and respond to issues that may be more immediately relevant and motivating to young people (Beane, 1995).

Susan Kovalik and Karen Olsen (1994) state that integrative education bases its practices on the characteristics of the human learner. They say that instead of artificially dividing the world into subjects and just using textbooks and seat work, students should be immersed in an enriched environment that reflects the complexities of life. Betty Jean Shoemaker (1989) adds that teaching facts and skills in separate subjects fails to prepare students for a swiftly changing world. Using integrative education, teachers can seek to improve students’ basic skills in language arts and mathematics while also teaching thinking skills, physical and sensing skills, and social skills.

One problem noted in the literature is that there is still no agreement on what curriculum integration should look like. There have been many attempts made to define curriculum integration (CI) models (Grubb, Davis, Lum, Plihal & Morgaine, 1991; Hoachland, 1999). All
models move away from the traditional model of instruction where subjects are taught individually completely isolated from context. All integration models have one thing in common - teachers incorporate concepts from other disciplines into their curricula. Academic subjects are fused with occupational, career, and life-skill content through many models ranging from individual teachers integrating content in lessons to teacher-teams integrating curriculum in career academies (Bottoms & Sharpe, 1996; Dougherty & Ellibee, 1996). The ultimate goal of integration is to make students aware of the connection among subjects. Those who support curriculum integration believe that schools must look at education as a process for developing abilities required by life in the twenty-first century, rather than separate, departmentalized subject matter (Fogarty, 1991).

Summary

Are CTE students more likely to meet the needs of future employees? If so, why? What skills did curriculum integration afford them? According to Tremaine (1992), vocational and academic curriculum must integrate in order to meet students' educational needs and make education more meaningful and relevant. Learning academics within a rich context helps students learn in an environment that reflects the way knowledge will be used in real life (Johnson, 1996). Although the Perkins Act funds are only available to career and technical programs, integration can apply to schools of all types and students from all backgrounds and with differing future aspirations.

Many of the researchers in career and technical education that this researcher reviewed were doctoral students interested in the change in career and technical education. Dr. Patricia A. Sturko from Washington State University and Dr. James A. Gregson from University of Idaho are very involved in how to teach teachers to successfully integrate academic and career
education courses. The core of the integration concept is to combine the best curricular and pedagogical practices of academic and vocational education into a single, integrated program that is available to all high school students (Bodilly, Ramsey, Stasz, and Eden, 1993).

Given the evidence presented thus far, career and technical education demands integration of academic and vocational studies. Eisenman, L., Hill, D., Bailey, R., and Dickison, C. summed it up when they said that students appear to benefit from curriculum integration by being more engaged in school. This proposed qualitative study of curriculum integration at this New England vocational technical high school has the potential to help other schools who are struggling to prepare high school students for careers. Understanding how integration is applied to both academic and vocational courses will help future professional development of teachers.

Chapter III: Methodology

This chapter presents the research question that guided this study as well as the research design used to investigate the lived experiences of teachers integrating academic and vocational studies. The following sections of this chapter discuss the validity and credibility of this study and the protections of human subjects. The concluding paragraph will summarize the importance of integrating curriculum.

Research question. The research question that guided this is: How are career and technical high school teachers integrating academic and vocational education in a vocational technical high school in New England? This question guided the data collected in the interviews and the classroom observations to learn about the subjects’ experiences with curriculum integration which is what Schutz (1967) calls “subjective understanding”.

Research Design. The nature of the research question calls for a qualitative study approach into the lived experience of CTE students at a New England high school. The teachers
chosen will be asked to describe their integration practices. Extensive interviews will be used to uncover the nature of their experiences (Creswell, 2009). Classroom observations will also be studied. The goal is to expand and generalize the theory of curriculum integration in vocational education (Yin, 2009). This researcher will be investigating curriculum integration of vocational and academic subjects “within its real-life context” (Yin, 2009, p. 18). This qualitative study will be evaluative in that this researcher will be assessing the merits of career and technical education (Merriam, 1988). The role of this researcher is to understand the lived experiences of other people and the meaning they make of that experience (Seidman, 2006). This researcher recognizes personal ties to this study and will explore the insights and data about curriculum integration (Maxwell, 2005).

The experiences of a small number of teachers will be examined through interviews and observations to uncover how integration happens (Creswell, 2009). A qualitative approach for this research has been chosen because the focus will be quality and not quantity where this researcher will be trying to understand process rather than demonstrating frequencies (Maxwell, 2005). The role as researcher is to conduct interviews, take extensive field notes, write memos, and transcribe tape recordings of the interviews as well as review classroom observations in order to uncover how curriculum integration happens. It is very important that the participants be open and honest and that they trust that this researcher will not use the data to harm them in any way. Because this researcher has worked at the school for over twenty years in the role of teacher before becoming the principal and has developed good strong working relationships with them and will get their honest answers.

**Site and participants.** The research site for this thesis is a career and technical high school in New England which is a public high school that offers academic and vocational
training to 480 students from 28 towns and one city and more than 40 out-of-county towns. The school is situated on 300 acres and offers specialty training to students who are interested in pursuing careers in Animal and Marine Science (veterinarian science, canine grooming and obedience, marine science, dairy and livestock management and equine studies), Plant and Environmental Science (floral design, urban forestry, landscaping, environmental technology, ornamental gardening and natural resources), and Diesel and Mechanical Technology (diesel and heavy equipment operation and repair, construction, welding and small engine repair). This career and technical high school believes agriculture and agribusiness are essential to regional, national, and global economies. The school recognizes that agricultural and environmental technologies are vital to global survival. Therefore, the school believes it is their mission to offer progressive agricultural education, a challenging academic curriculum, and work experiences that prepare students for continued learning. Some of the school’s goals are to:

1. Provide a positive, safe and orderly environment that promotes active learning and the development of strong communication skills.

2. Provide positive and challenging work-based learning experiences through strengthened relationships with business partners and community employers.

3. Integrate academic and vocational curricula to maximize learning by fostering collaboration and communication among and between departments.

This career and technical high school is committed to offering students educational experiences that foster the development of social, emotional and cognitive skills that provide for critical thinking as well as verbal and written communication. This school also strives to develop in students a proper work ethic to ensure employment and/or career advancement. Both academic and vocational programs encourage positive attitudes toward learning, community involvement
and social relationships. Students learn to respect and take pride in good workmanship and to understand that learning is a life-long process. This school emphasizes the student's individual responsibility to make the world a better place by being an informed and active citizen in their community.

This New England career and technical high school offers a Cooperative Work Experience Program (COOP) to eligible students in eleventh and twelfth grades during the fourth and final marking periods of each school year. The COOP program is scheduled during vocational time only. Students are required to attend all of their academic classes. COOP provides an opportunity for upperclassmen to participate in a work-experience program related to their agricultural major.

Also, four internships are offered to eligible juniors at the following sites: New England Wildlife Center (NEWC), Mass Bay Community College (MBCC), Massachusetts General Hospital (MGH), and Milton Caterpillar. Besides receiving college credit for the time spent at the internships, for six weeks, students do research, work in labs, take classes and get a chance to practice ‘real life’ work experiences. All students take a course called Business Management in their junior and senior year. One of the requirements of these courses is to write a skills essay detailing the career skills that they have learned during their time at this school.

For this study, this researcher will focus on some of the people involved in these internships. This researcher has chosen to conduct a qualitative study partly on the work of this particular group, because they have had the opportunity to experience a work setting related to their career and technical interests. Therefore the sampling for this study is purposive, not random (Miles and Huberman, 1994). The participants will be deliberately invited to participate as only they can provide the specific information needed for this study (Maxwell, 2005, p. 88).
Fourteen teachers will be chosen to participate in this study: half from the Animal Science and Plant and Environmental Technology departments and half from the Academic Department. Four will have been involved in the internships. Most teachers chosen have been at the school for at least four years.

Cresswell (2003) states that purposeful sampling happens when a researcher intentionally selects the site and/or people to understand a phenomenon. This researcher will be able to gather information to answer the question that is raised in the problem of practice about how integration is working at a New England vocational technical high school. The focus on these particular teachers will help this researcher achieve the data that will eventually guide me through the research question.

Data collection. This researcher will be using many data sources as Yin (2009) suggests to “Investigate a contemporary phenomenon within the real life context” (p. 13). Merriam (2009) and Yin (2009) state that there can be six major types of data collection evidence (documents, archival records, interviews, direct observation, participant observation, and artifacts) in case studies. Yin (2009) states that case studies are likely to be much more convincing and accurate if they are based on several different sources of information, following a corroborating mode. This researcher will use the following four for this qualitative study: direct observation, documents, archival records, and interviews. For documents and archival records, I will be reviewing lesson plans and written curriculum collected during formal observations that include curriculum integration from the chosen subjects. I will draw from pre and post-observation meetings and the actual observation conducted. I will be looking for the four items Beane (1997) states that categorize curriculum integration:.

1. Personal – which address the self-concerns of students;
2. Social – which addresses societal and world issues;

3. Explanatory – whose content names, describes, explains, and interprets;

4. Technical – which are ways of investigating, communicating, analyzing, and expressing.

Participants will be interviewed with the hope of understanding their perspectives about curriculum integration. An interview protocol for asking questions and recording answers and a contact summary sheet will be followed (Creswell, 2007; see Appendix XX and XX, respectively). These four data sources of evidence will comprise the data to be analyzed for the purpose of the qualitative study. Multiple data gathering strengthens the grounding of theory (Merriam, 1988).

**Data analysis.** To reduce the risk of the limitations of single sources, this researcher will use triangulation by collecting information from a variety of sources as mentioned above. Since this researcher wants to discover, understand, and gain insight into how this career and technical school uses curriculum integration to meet the needs of a 21st century, this researcher will use purposeful sampling (Patton, 1980). Analysis will be ongoing (Merriam, 1988). Memos will be used to write down what this observer is thinking when reviewing data. This researcher will first identify units of information organized into a qualitative study data base that will serve as the basis for defining information (Yin, 1984). This researcher will look for many people repeating the same thing or the frequency with which something arises. This researcher will look for uniqueness in answers, also (Guba and Lincoln, 1981). After the categories are made, this researcher will try to define the categories into properties and form hypotheses to build a theory. As Yin says, this researcher needs to prepare, but also prepare to discover.
Figure 3.

*The Coding Manual for Qualitative Researchers* by Johnny Saldaña (2009) will be used to code the information this researcher discovers. One of the purposes of the manual is to provide sources, descriptions, examples, and applications for coding and analyzing qualitative data. After interviews are transcribed, data collection completed, and memos organized by categories, coding can occur. Using both interviews and observations gives my conclusions more credibility. Maxwell (2009) believes that while interviewing is an efficient way of understanding one’s perspective, observation can lead me to draw inferences. Watching the theory in use was very powerful.

Codifying is synonymous to categorizing. A code is a word or short phrase that captures a summative attribute from data. Themes will be formed from the coding. “A theme is an outcome of coding… A theme is a phrase or a sentence that identifies what a unit of data is about or what it means” (Saldana, 2009, p.139). The data was grouped into repeated ideas. First I discerned these themes and then clustered them to develop an integrative theme.
Next, I will use the themes to show how teachers integrate curriculum, themes common to most, and the benefits of integrating. This description will show common themes that occur during the code analysis. This will be completed within four weeks of the completion of the interviews. I will then relate the findings to my theoretical framework and a written qualitative analysis and interpretation of the data will be completed within eight weeks. A final interpretation of the data including what I have learned, whether there are areas that need further investigation, and the summary of my research will be completed within a month of the final interviews.

**Limitations of study.** There are some limitations to this qualitative study that should be noted. This qualitative study involves a very unique vocational and technical high school which is different from most regional career and technical high schools in that students attend both academic and vocational classes every day. It is also unique in that the career and technical areas are interrelated. This school has a high retention rate (students enter in grade 9 and graduate) and a low dropout rate, which was 0% in 2009-2010. The attendance rate is about 96%. The number of students attending post-secondary programs upon graduation has also increased. This number has exceeded 70% for the past four years. As this career and technical school has strengthened and improved the academic courses, more students have opted into two and four year colleges. More than 20% of the students find employment in related occupations. Internship programs for students with the Massachusetts General Hospital Center for Comparative Medicine, The New England Wildlife Center, the Arnold Arboretum in conjunction with Mass Bay Community College, and Milton Caterpillar in conjunction with Massasoit Community College provide tremendous career opportunities.
All members of the last six graduating classes reached the competency determination on the statewide mandated Massachusetts Competency Assessment Testing (MCAS). This means that they passed both the English Language Arts and Mathematics tests. A strong developmental program and remediation program integrated throughout the curriculum certainly have a role in this success. This high school’s scores were higher than the state averages and other career and technical high schools. The experiences of the students, teachers and employers involved in this qualitative study may those associated with other career and technical high schools or other schools in general. Information about this school will be included in the results of this qualitative study so that readers can decide if this qualitative study can be easily transferable to their settings.

This researcher will guard against personal biases by making thorough memos on thoughts as the analysis of the data collected occurs during this qualitative study. This researcher has been employed by this school for the last twenty three years. For the last three years, this researcher has worked as an administrator as Principal, Assistant Principal and Director of Academics. Prior to this, this researcher was a Mathematics instructor. Currently, this researcher supervises a staff of fifty three teachers who are dedicated to expecting high performances from their students. They believe in career and technical education and the integration of academics and vocational studies. This researcher’s experiences and beliefs have to be guarded so as not to influence the results of the qualitative study report.

**Validity and credibility.** All participants will be asked the same questions during the interview process which this researcher will have previewed with people not in the study. While reviewing the interview answers, observation reports, and pre and post observation meeting reports, this researcher will maintain a memo section to record thoughts at the time of the review.
This researcher will then chunk the information into categories and then give each category a code. After reviewing and coding the information from both interviews and observations, this researcher will then try to group topics and combine categories to make a smaller list.

Although reliability plays a minor role in a qualitative study, validity is a strength (Cresswell, 2003). This researcher hopes that the method of coding described above will help the triangulation of the different data sources into cohesive themes. My bias for the accomplishments of my school is the strongest threat to validity in this qualitative study. After this researcher records initial results, this researcher will review them with peers involved in the study to make sure there is no misrepresentation of their ideas or include any of this researcher's own bias.

**Protection of human subjects.** There does not appear to be any risks to anyone participating in this study. This study will document current practices of staff and not be used for evaluative purposes. Hopefully this study will help students be ready for life in the 21st century. Participation will be voluntary. This researcher will gain informed consent and protect privacy by keeping names confidential. This researcher will avoid use of any deception in my study.

When results of this qualitative study are formulated, all participants will have the chance to review them and if necessary, they will have the right to have anything removed that they feel violates their privacy or misrepresents their information. When beginning this project, this researcher spoke to my Superintendent who is fully engaged in the project and its results. This researcher submitted my research plans to the Northeastern University Institutional Review Board and received approval to implement the research project described in this thesis on May 23, 2012.
Summary

In this study, the researcher sought to document how a vocational technical high school worked to address the problem of practice - the importance of career and technical education in a 21st century world. High schools need to keep up with an ever-changing world and this study will show how career and technical schools are accomplishing that goal through curriculum integration.

The highest ranked skills for students entering the workforce are not facts and basic skills but applied skills that allow workers to use the knowledge and basic skills they have acquired. The most desirable skills are work ethic, collaboration, social responsibility, critical thinking and problem-solving. Employers also see creativity and innovation as being increasingly important in the future. Although all students will not become experts in their coursework, it is important that teachers help them understand that knowing a subject is not just about memorizing facts. More importantly, the goal should be for the students to learn how to organize the knowledge to connect it to problem situations.

There is much current research being done on the effects of educational reform and the teaching of 21st century skills. This study complements that research and adds a new twist – the career and technical school method of integration. Experiential learning is highlighted in this thesis as a way to prepare students for success in college, career and life. This project may be used by all schools to evaluate their own curriculum.

The qualitative study method was chosen to investigate integration being taught at this career and technical high school in New England. This researcher chose to do a qualitative study because I wanted the project to be inductive, focusing on integration. The results of this qualitative study may be used to improve practice at my school and others.
Chapter IV: Research Findings

The purpose of this chapter is to report and discuss the findings from the research conducted at a career and technical high school where integration of academic and vocational curriculum is used. The first section provides a brief review of the study context and defines technical terms associated with the study. The second section presents emerging themes connected to the research question as identified through an analysis of the individual instructor interviews and observations. The final section presents a summary of the key research findings.

Study context. Curriculum integration can take on many forms. For the purpose of this study; curriculum integration will be defined as an integration of one course/discipline with another course/discipline. Most of the teachers in this study refer to integration as a mixing of vocational and academic studies. During the interviews and observations, it was noted that many academic teachers used combinations of academic disciplines as examples of integration.

This study was conducted at a career and technical high school that is known for its success in standardized testing (MCAS), high attendance rates, zero dropout rate, and high percentage of students going onto school after graduation. These interviews were conducted over a 4 month period during the teachers’ free time. These observations were done over a two tear period.

Interview Analysis - How are career and technical high school teachers integrating academic and vocational education in a vocational technical high school in New England?

Coding for themes. Themes developed from the responses in the face-to-face interviews with the teachers. In the first cycle, these themes were coded using in Vivo coding to ensure that the actual language and voice of the participant was honored (Saldana, 2009). The data was then
categorized and themes were established across different groups. Saldana 2009 refers to this type of coding as structural coding.

Upon review of all teacher interviews themes were identified in three ways:

1. As they pertain to vocational teachers,
2. As they pertain to academic teachers, and
3. As they pertained to both vocational and academic teachers.

Each section below presents the themes as identified across the teachers.

**Vocational teachers.** The vocational teachers interviewed felt that integration was a natural occurrence. The two most common themes are presented in Table 2 below.

Table 2 - Themes pertaining to vocational teachers.

<table>
<thead>
<tr>
<th>The link to academics is natural.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students get a chance to solve work-related problems.</td>
</tr>
</tbody>
</table>

*The link to academics is natural.* Almost all of the vocational teachers felt that connecting their curriculum happens with little effort. All of the Animal Science teachers interviewed spoke of integrating Mathematics into their curriculum. One teacher spoke of making the math ‘simple’. When questioned further she explained that sometimes students had trouble with percentages so they are given the steps to solve percentage problems in a spreadsheet already prepared. “The student just needs to plug in the numbers and as they get better, we take away the (spreadsheet) tool.” When another teacher was asked if the students balked at doing math in their Animal Science class, she said they did not because they could relate the math directly to the medicine needed for the animals. Another stated that the word problems were actually real life problems about our farm and animals on campus that they
solved together. The students did not question why they had to do math because they were solving everyday problems.

**Students get a chance to solve work-related problems.** Many of the vocational teachers agreed that students learned the material more when they could relate to their jobs. One teacher felt that it was easy to give homework that was work related. Students enjoy a work related problem, “I think because they can relate it directly to the animals” agreed an animal science teacher. Another said when students bring in problems from their work, “They see what they learn in class is not fluff.” Another teacher mentioned that it would help if the academic teachers would communicate with the vocational teachers more so that they knew what the students were learning and could bring real life examples into the academic classrooms as well. The computer teacher stated that he felt that 100% of the students are more engaged when he uses real life examples while teaching Excel.

**Academic teachers.** The academic teachers interviewed felt that integration helped the delivery of their curriculum. Two of the most common themes they found are listed in Table 3.

Table 3 – *Themes pertaining to academic teachers.*

<table>
<thead>
<tr>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students show more interest when they can see a connection.</td>
</tr>
<tr>
<td>Integration takes time; we have to cover the curriculum.</td>
</tr>
</tbody>
</table>

**Students show more interest when they can see a connection.** Many of the academic teachers concur that students are more focused on the topic when they can realize the connection to their own lives. One English teacher stated, “Most of the richness of your educational experience comes in a hands-on way.” When he chooses stories to read with vocational themes, students are captivated from the start. Another teacher stated, “Certainly at this school there is enough opportunity to reach across subject areas and to try integration. It is what is going to
make it come alive for the kids.” When working with literature, she is always trying to find ways that connect to the students’ lives and that have real world application because “like any kid if it is not personalized they won’t care about it.” Another teacher stated that “100% of his computer application students are more engaged using real life examples in discussions and on the computers.

*Integration takes time; we have to cover the curriculum.* The major complaint from all academic and some of the vocational teachers was lack of time. Covering the frameworks takes all the time they have. Many saw integration as a ‘project’ and could not see how they could fit it in and still finish their set curriculum. One teacher said that “working on projects is fun but you lose a lot of class time.” One math teacher stated, “Sometimes I am racing through the curriculum because I spent so much time getting them over their fears of math, that I do not have time to think about integration.” Two mentioned that worrying about the MCAS hinders their use of integration. They stated that the school’s focus on MCAS has added to what needs to be covered each year.

*Vocational and academic teachers.* Both vocational and academic teachers felt that they would like to integrate more often. Table 4 lists some of the most common themes between them.

Table 4 – *Themes pertaining to both academic and vocational teachers.*

<table>
<thead>
<tr>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>During integration, students learn so much more from their peers.</td>
</tr>
<tr>
<td>Mostly teacher centered curriculum.</td>
</tr>
<tr>
<td>Lack of common planning time is a major hindrance.</td>
</tr>
</tbody>
</table>
During integration, students learn so much more from their peers. This theme was common to vocational and academic teachers. Two scenarios were identified: students working in groups within a class and students working with other classes. All teachers whose students work in groups felt that students learned from their peers. When a new concept was taught and students were put into groups to practice the new concept, they were able to help each other through any rough spots. If the teacher was occupied helping a student, other students who needed help could get help from their peers instead of having to wait for the teacher to be free. When students are working in groups in science, their calculations are usually more accurate because of the group effort. One teacher used an example where an animal science senior class worked with a Biology freshmen class. She stated that the seniors who were demonstrating the dissection learned as much as the freshmen who were being taught. During the reflection of the lab, the seniors said that having to teach the unit made them review their knowledge for accuracy. The freshmen wrote that they enjoyed learning from the seniors. Three teachers stated that they do not put their students in groups often because of the lack of structure.

Mostly teacher centered curriculum. All teachers concurred that their classes are teacher-centered not student centered. Two English teachers said that they give the students the list of required reading books for the term and the students choose the order that they will be read. One teacher asks her classes whether they want to learn grammar as a separate unit or within the context of the short. When another teacher assigns projects, she asks the students to take part in writing the grading rubric with her. One Animal Science teacher mentioned that he had taken a creativity course and learned that a student-centered class was beneficial but he felt constrained by covering the frameworks. Another teacher was having trouble keeping her
students’ attention so they had a discussion about what would make the course run smoother.

Together they came up with activities that covered the material and made the students happier.

*Lack of common planning time is a major hindrance.* All teachers agreed that they do not have common planning time built into their schedules so that meeting with other teachers for the purpose of integration is very difficult. They feel that it needs to be built into their schedule to make it happen. One teacher suggested a team approach to teaching used by some middle schools. She predicted that if we were to adopt this method teachers would have time to meet as a team each week and discuss curriculum common to all.

*Table 5 Integration Activities*

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Subject Areas</th>
<th>The link to academics is natural.</th>
<th>Students get a chance to solve work-related problems.</th>
<th>Students show more interest when they can see a connection.</th>
<th>Integration takes time; we have to cover the curriculum.</th>
<th>During integration, students learn so much more from their peers.</th>
<th>Mostly teacher centered curriculum.</th>
<th>Lack of common planning time is a major hindrance.</th>
</tr>
</thead>
<tbody>
<tr>
<td>JA</td>
<td>medical calculations with math</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>KJ</td>
<td>percentages with sheep on a farm</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>LG</td>
<td>dissection with Biology</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>MM</td>
<td>percentages with lamb crop</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>DQ</td>
<td>Excel spreadsheet with farming</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>EC</td>
<td>Linear Algebra with Ag Mechanics</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>LH</td>
<td>Book on horses for English class</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>0.5x</td>
<td>X</td>
</tr>
<tr>
<td>Teacher</td>
<td>Course</td>
<td>X</td>
<td>Y</td>
<td>Z</td>
<td>A</td>
<td>B</td>
<td></td>
<td></td>
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<tr>
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<td>---</td>
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<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LB</td>
<td>dissection with Animal Science</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SF</td>
<td>proportions with Physics</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WC</td>
<td>book about animals for English</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SS</td>
<td>writing in Social Studies</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MaM</td>
<td>Math measuring diameter of trees</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BB</td>
<td>Math with Ohm's Law</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SC</td>
<td>English with History</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JL</td>
<td>Environmental Science with Math</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JS</td>
<td>Math with Environmental Studies</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MW</td>
<td>Chemistry with Math</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RBB</td>
<td>Math with Chemistry</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Document Analysis – How are career and technical high school teachers integrating academic and vocational education in a vocational technical high school in New England?**

This document analysis includes my notes from the pre-observations, lesson plans, observation notes, and post-observation conversations. The document review looked for activities and connections to the academic and vocational curriculum integration. Upon review of all records from observations including pre and post meetings, themes were identified in three ways:

1. As they pertain to vocational teachers,
2. As they pertain to academic teachers, and

3. As they pertained to both vocational and academic teachers.

During the pre and post observation discussions, vocational teachers mentioned that they had an advantage over the academic teachers because it was so easy to make their coursework relevant. Table 6 shows two common themes among the vocational teachers.

Table 6

| Students understand and appreciate the nature and relevance of what they are studying. |
| Students are able to relate their studies to careers. |

**Students understand and appreciate the nature and relevance of what they are studying.** During many of the pre-observation meetings, the vocational teachers stated that they include “why” they teach the curriculum. In their lesson plans, they wrote that they would review current knowledge about certain academic topics, i.e. grammar, percentages, diameter, and proportions. During the observations, I was able to witness students applying these ‘academic’ skills to topics such as lamb crops, ability to feed sheep on a farm, and pharmaceutical needs per pound of animal weight. One teacher noted during the pre-observation meeting that students are heterogeneously grouped in their vocational classes so allowing them to work in groups helped the students work through any new, unfamiliar to some, math material. When I spoke to one student after the class, she mentioned that she was not in Algebra II yet, but that her lab partner was and showed her a shortcut to solving proportions. She was going to show her math teacher.

**Students are able to relate their studies to careers.** During the spring term, some students are involved in an internship program. The vocational teachers use this opportunity to relate their curriculum to career fields. Students spoke about their experiences during some of the
lessons. One student asked if she could show how they tested an animal in the lab where she worked. All vocational teachers spoke about career paths where the material they were teaching would be needed and any job opportunities tied into their lessons. Guest speakers are an integral part in lesson planning in the vocational classes. Nearly all vocational teachers felt that these guest speakers help in making their connections to careers a reality for their students.

**Academic teachers** discussed their desire to connect their curriculum to the vocational topics and some limitations in doing so. Common themes are shown in Table 7.

Table 7

| The academic teachers wanted more common planning time with the vocational teachers. |
| Students learned their material better when taught through a vocational lens. |
| Students were more motivated to learn the material when they were able to apply it. |

**The academic teachers wanted more common planning time with the vocational teachers.** Of the academic teachers participating, all said they could benefit from common planning time built into their schedule. All but one felt that they did not have enough expertise about the vocational courses. They felt that time was needed to make meaningful connections between their topics. As a ‘ticket to go’ one math teacher asked her students to reflect in their notebooks how this lesson on triangle trigonometry might be used in their vocational courses. When questioned during the post observation, the teacher stated that the students were able to make the connection especially the Mechanics majors. This has cut down on the question, “Why do we have to learn this?”

**Students learned their material better when taught through a vocational lens.** All of the academic teachers felt that the students enjoyed solving problems related to their vocational subjects. The science teacher felt that her dissection unit went so well because she worked with a
vocational teacher who also does a dissection unit and was able to apply the concepts to the trade experiences. An English teacher chose for his class to read a book about horses hoping to develop proficiency, confidence and fluency in reading. His students had not been working as well as he thought they should so he gave them choices of books for the next unit. When observing this class, I noticed that the students were fully engaged in the discussion and had completed their homework from the previous night. During the post conference, I asked the teacher how he thought the lesson had gone and he agreed that it was a success. The students had not been doing any independent reading before this unit.

_Students were more motivated to learn the material when they were able to apply it._ All academic teachers were in agreement that students were more motivated to learn when they saw a need for what they were learning. Two academic teachers, one science and one math, worked together on a unit on rockets and propulsion. Both teachers introduced the unit. The physics teacher explained ‘the why’ and the math teacher explained the ‘how’. Students were very motivated, working in groups to build their rockets. They completed their lab reports including the functions and trajectory graphs with ease. They understood vertex (time and maximum height) because they had lived it.

**Both vocational and academic teachers** agreed that integration led to increased student achievement as explained in the themes in Table 8.

Table 8.

| Students made meaningful connections between subjects. |
| Students could apply the material when it was connected to something they were familiar with. |
Students made meaningful connections between subjects. All academic and vocational teachers required students to be accountable for class discussions where application was emphasized. During the pre-observation meeting, one Chemistry teacher mentioned that he was counting on the fact that the students would be able to transfer their knowledge of proportions from their math class to be able to balance equations. During the class, he was giving an example of balancing equations and one student questioned why they had to do math in science class. His response was, “Why do you eat at school? Your family taught you how to eat at home.” The point was well taken and the lesson continued. During an observation of an animal science teacher teaching about snakes, he mentioned that the snake should not be longer than the diagonal of the cage. He asked how many knew about the Pythagorean Theorem. The students said that they had learned it in Math class. They applied it to the snake problem with ease.

Students could apply the material when it was connected to something they were familiar with. During career classes, students are asked to use more critical thinking skills such as evaluating sample resumes and cover letters for possible job opportunities in their chosen vocations. When they are reviewing for jobs in their career fields, they are able to accurately assess the quality of the resume and cover letter. The career teacher stated that this has improved their skills at writing their own resumes and cover letters.

Summary of the Findings

The findings of this study are compiled from the combined voices of academic and vocational teachers as they commented on their experiences with curriculum integration. As perceived by vocational and academic teachers, they are as follows:

- When students see a connection to their lives, they are more engaged.
- Teachers want to integrate with their peers but feel the need for scheduled common planning time.
- Teachers feel time constraints in covering curriculum which hinders integration attempts.

**Chapter V: Discussion of Research Findings**

**Revisiting the problem of practice.**

There has been much written about 21st century skills needing to be taught but schools also needing to prepare students to pass state, and national standardized tests at levels of proficiency and above. This narrow focus on academic skills and student performance on standardized testing based on set learning standards is affecting the curriculum in vocational schools.

Researchers are concerned about the insufficiency of traditional schools. Standards-based; complex global environment. Tomorrow’s workers will need to be able to engage in life-long education. They must be able to learn new things quickly, perform more non-routine tasks and solve more complex problem. They will be required to make more decisions, understand more about what they are working on, work under less supervision, and assume more responsibilities. It appears that students benefit from curriculum integration by being more engaged in school. Because they see connections between school and their career interests, these students stay on task, take more challenging courses and continue to graduation.

The purpose of this study was to research how a career and technical high school in New England is integrating academic and vocational skills to meet the needs of a 21st century society.

**Review of the methodology.**
This study was designed to answer the following research question: *How are career and technical high school teachers integrating academic and vocational education in a vocational technical high school in New England?*

To answer this question this researcher conducted a qualitative study approach into the lived experience of CTE students at a New England high school. The teachers chosen were asked to describe their integration practices. Extensive interviews, observations, pre and post observation meetings were used to uncover the nature of their experiences. All data was then coded for significant themes.

This chapter will be broken down into the following sections: summary of findings, a discussion of the findings in relationship to the theoretical framework, a discussion of the findings in relationship to the literature review, a conclusion, the significance of the study, and the next steps.

**Discussion of Findings in Relation to the Theoretical Framework**

This study was informed through the perspective of curriculum integration theory. This theory served as a lens to investigate the integration of curriculum at this vocational-technical high school. Teachers should provide a more stimulating and interactive classroom that would encourage learners to fuse together prior knowledge and new experiences to problem solve and develop cognitive abilities (Piaget & Inhelder, 1969).

**Integration theory.** Almost all participants agreed that integration was important for their students’ future success in a career or in further education. As Humphreys noted, “Children broadly explore knowledge in various subjects related to certain aspects of their environment”, many teachers agreed that students showed more of an interest when they could apply learning to
something of interest to them in their lives. The teachers felt that deeper learning led to better application.

Beane believes that students should work together on concepts that should be constructed from students own experiences and that students learn and retain information by reflecting on these experiences. Beane’s model of curriculum integration speaks to collaboration. Many teachers commented on how well students learned from their peers while working in groups. One mentioned how freshmen were in awe of working with the seniors on dissection. The seniors were very considerate towards the freshmen, also.

As Beane stated integration promotes democratic social integration. But some teachers noted that the level 2 students enjoyed working in groups more than the level 1. The level 1 students asked why they couldn’t do the work alone, especially if a group grade was involved. Other comments recorded were:

“Why aren’t we using the book?”

“Can’t you just give us the worksheet?”

“Can’t you just show us how – give us the steps?”

These teachers were committed to the group learning experience so they continued on. After time, this active learning model was better accepted by these students.

**Discussion of the Findings in Relation to the Literature Review**

The findings of this study relate to the literature review presented in Chapter 2. The literature review focused on three guiding questions to inform this study:

1. How have vocational schools changed and why?
2. How has Educational Reform changed CTE schools?
3 What does prior research say about integration of academic and vocational studies (21st century skills)?

**Vocational schools and how they have changed.** The Literature examined the effects the Carl D. Perkins Act of 1998 had on vocational schools. This Act called for a state performance accountability system in which the objective was to promote academic and technical performance, integration of academics in career and technical education, as well as postsecondary placement of students. The findings in this study confirmed that integration of academic and career and technical studies is happening. In the vocational classes, this study found that integration happened naturally, without much planning on the participants’ part.

For some of the participants in the study, integration took planning and effort. They felt that integration was important but some did not how to make it happen. Time was an issue for some of the academic participants – common planning time. They wanted to meet with other teachers to be able to discuss integrating with them.

**Educational Reform as it Applies to CTE Schools.** As mentioned in Chapter 2, when the Carl D. Perkins Vocational and Applied Technology Act of 1990 was passed it was intended to strengthen the workforce preparation process for vocational/technical schools with a focus on integration. But because teachers focus their instructional practices on skills and strategies that align to state standards for their students’ success on the Massachusetts Comprehensive Assessment System (MCAS), integration is taking a back seat. The findings from most teachers in this study were that covering the frameworks took all their time and they wish they had more time to focus on integration. The participants felt that they were being evaluated on how students scored on the MCAS tests, so they needed to focus on covering the frameworks. Unfortunately focusing on these standardized tests made the teachers lose sight of the fact that those who
believe in the success of the Perkins Act believe “that to produce higher achievement following high school completion academic components must be strengthened through correlation with vocational relevance.” The participants felt that students are more prepared for post-secondary education now because of the Perkins Act but are not sure that they are better prepared for the 21st century workplace.

Integration of Academic and Vocational Studies. Integration of academic and vocational studies aims at increasing the quality of technical education within the United States in order to help the economy by providing all students with an education that will help them in the workplace and in life. Better communication skills are one of the major demands of industry. Integration addresses this need. If students are more involved in what they are being taught, they will learn it better. The findings from this study showed that very few participants had student-centered classrooms. A few vocational teachers mentioned that students could change the order that the lessons were taught. Some allowed students to focus the material on the animals that were of interest to them. One academic teacher allowed her students to decide how they would be taught grammar – through stories or as a separate unit. Another English teacher allowed the students choices from a prescribed list as to what they wanted to read for the year.

The 21st century workforce is one where workers need prodigious communication skills to help them with problem solving. The findings from the participants in this study showed that one change that almost all teachers have incorporated into their classes was that their students work in groups occasionally. For some participants it was a struggle because their students don’t enjoy group work. Some reasons given were that when working in groups, some students end up doing all the work while others get away with very little work. Two of the teachers did not see the value in group work and allowed the students to work alone if they preferred. Professional
development in group work appears to be needed. Choosing students for groups was a challenge for some participants. Assigning roles within the groups to answer the concern about one student doing the majority of the work as also noted as a challenge for some of the participants of this study.

The literature states another component of integration as the infusion of career planning and development throughout the education process. The vocational teachers in this study mentioned that they used examples of real-life job situations in their lessons. Many spoke of including students’ experiences in labs where the students were working in their daily lessons. They used actual problems or scenarios that would occur. One vocational teacher stated “We talk about the education needed to get them careers in these fields. We break down certifications necessary for the careers. We talk about current events, and have them go online and look up jobs in these fields.” There is a strong example of a connection to Dewey’s belief that students should be “educated through the occupations rather than for the occupations.”

**Limitations**

Given the small sample size used in this study, claims cannot be made regarding the scalability of the results. Because the participants were all members of one vocational technical high school in Massachusetts, the results may not be representative of all teachers in career and technical high schools in the state or in the country. Another limitation is that this vocational technical high school is agriculturally based which may or may not have limited the integration of curriculum. In addition, the researcher is an administrator at the school so the participants could have tempered their answers which could largely have limited the study.
Future Studies

Although there are many positives of curriculum integration, serious issues are brought forth. Teachers will need knowledge beyond their discipline areas, including practical understanding of how academics can be used in a vocational setting and vice versa. Teachers will need to know how to promote active student-centered learning environments, also (Eisenman et al. 2003). There is a gap of knowledge (thesis statement in accordance with Machi and McEvoy (2009)) in how successful integration is accomplished which leads me to my research question, “How is a New England vocational technical high school integrating their curriculum?” Preliminary research suggests that professional development in the area of curriculum integration skills has not been a principal focus of scholars.

Conclusion

The research question that directs this study focuses on what practices this vocational technical high school uses around curriculum integration. The teachers’ responses provide insight into how easily some lessons can be integrated and the benefits for the students when they are involved in an integrated lesson. While this topic has been discussed and mandated since the time of first Perkins Act of 1984, there is still a long way to go to full implementation. The results of this study indicate that curriculum integration would benefit students now and in their future plans whether that includes college, careers or both. They will be provided with better communication skills, problem solving skills, and added career awareness.

All teachers were in favor of curriculum integration. Both academic and vocational teachers spoke of a desire for more curriculum integration in their lessons. Their major concerns were covering the state mandated curriculum frameworks and the lack of common planning time that they felt curriculum integration required. Professional development is so important for the
success of any major change to a teaching model. Common planning time must be allowed in the teachers’ schedules for the collaboration needed for integration to be successful, also.
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Appendix A

Interview Questions

Background Information:

1. What is your educational background and highest degree earned?
2. What subject(s) do you teach?
3. How many years have you been teaching in this school?
4. Have you taught anywhere else? If so, for how long and what subject?
5. Do you integrate vocational and academic studies in your teaching?
6. If so, please give examples.
7. How do you do that?
8. Tell me more.
9. How do students respond to that?
10. Are students engaged?

Teacher’s Experience

1. How do you connect your curriculum and your students’ learning to real world situations?
2. If so, please give examples.
3. Tell me more about that.
4. Does it make the learning more meaningful?
5. Do students in your classes work in groups?
6. Do students have a part in voicing what they want they learn or how they learn planning lessons?
7. Tell me how your lessons are student-centered.
Give me an example.

8. How do you know whether or not your students are able to apply their understanding of the concepts and methods of your subject to real world settings?

9. Give me some examples.

10. How can the school do a better job of helping integration?