Perspectives of Career and Technical Education Pathways and
Linked Learning Outcomes for High School Graduates

by

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ABSTRACT

In large urban school districts such as Los Angeles, New York, Chicago, and many others, as many as half of the students starting their first year of high school do not finish. The economic costs are over $150 billion annually without considering the incalculable personal and social costs. Now, more than ever, it is critical to find different pathways to connect to high school students and engage them as they prepare for postsecondary life. The specific objective of this research was to determine student perceptions of how core academic programs that are linked with core academic curriculum and real world experiences such as Linked Learning contributed to engagement in high school and readiness for postsecondary life. In addition, this study examined teachers’ and administrators’ perceptions of Career and Technical Education (CTE) pathways and, more specifically, their views on the integration of CTE and core academics, as well as influences on student engagement and preparation for postsecondary education and career readiness. This study used a mixed methods approach, including a student survey, student and teacher focus groups, and interviews with administrators. This research paper found that students enroll in a CTE pathway more to prepare for a potential career than for any social reasons. Additionally, CTE pathways helped student engagement and comprehension of other core academic subjects, such as English and mathematics. The research also found that educators did not promote, request, nor demand the increased integration of CTE and core academics. More detailed longitudinal research on the impact of various CTE pathway approaches on high school graduate outcomes is needed to better understand whether change should be pursued.
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The thought of a life of service must have been ingrained in me at an early age. Growing up in a small Midwestern Wisconsin town and being raised by two wonderful parents, themselves educators, left long-lasting impressions that have guided my subsequent steps. The dedicated and committed teachers and coaches who touched my life have influenced me every morning and throughout every day of my life.

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ability to adapt to a myriad of lifestyle and scheduling changes have allowed me to pursue
my personal goals embedded within this research. It is my fervent hope and desire that
this research might contribute to any holistic change that may improve the world in which
we live.
CHAPTER 1—INTRODUCTION

Integrating Career Technical Education (CTE) with core academic subjects is a concept that was developed over 100 years ago. The Commission to National Aid to Vocational Education noted in 1914 that public schools planned for those intending to go to college instead of the majority of students who would go to industry (Wonacott, 2003). Therefore, since not every high school graduate went on to college, public schools did not adequately serve a significant number of students. Students who had not planned to go on to college were marginalized and left with the product of an educational system designed for those with different goals. Through the years, educational planners have begun to account for all students more equitably, and high schools have adapted curricula to better prepare all students for various postsecondary opportunities. LeGuillou (2011) stated that, as of 2007, although progress has been made over the past century, many still question whether it has been enough. Levy and Murname (2004) pointed out that 78% of employers canvassed in their study believed that public schools were failing to properly prepare students for the workplace.

An increasing body of evidence supports the belief that current perceptions of CTE’s value within the American educational system originate from a culture and mindset that separated technical, hands-on education from what was, and often still is, considered more academic instruction (Aliaga, Kotamraju, & Stone, 2012; Wonacott, 2003). That mindset established racial, social, and ethnic biases and stereotypes that, in some instances, still exist today (Grubb, 2008). Countries outside the United States have taken a more holistic approach to education, merging classroom and business environments (Symonds, 2011). Some districts across the United States have adopted a
Linked Learning strategy to integrate technical real-world activities with core academic instruction.

Findings on the efficacy of integrated pathways such as Linked Learning have been inconclusive (Bozick & Dalton, 2012; Castellano et al., 2007). However, a significant number of researchers have identified positive outcomes associated with the blending of technical and core academic education. Some of these benefits included an increase in engagement and graduation rates while reducing the number of dropouts (Richmond, 2010). Linked Learning is an integrated approach that can bring together rigorous academics, career and technical education, and real-world experiences to help prepare students to compete in the modern fast-paced technological society they will face after graduation. Because an increasing number of integrated programs such as Linked Learning have been initiated at schools only within the past decade, longitudinal data on the outcomes of graduates who were enrolled in these programs are limited (Alfeld & Bhattacharya, 2013). Therefore, the perspectives of high school graduates who have experienced integrated courses such as those offered through programs like Linked Learning could offer important insight. Additionally, the perspectives of former students from such an integrated curriculum could help guide the future direction of programs such as Linked Learning.

The state of California committed to the Career Technical Education Pathways or Linked Learning Program when state Senate Bill 1017 was reviewed in 2012. One of the sections of this bill stated, “Studies show that programs that bring together strong academics, demanding technical education, and real world experience are more likely to
engage pupils, raise high school graduation rates, and better prepare pupils for lasting success in postsecondary education and careers” (S. 1017, 2012, § 1.a.5).

Elmore (1979) described the concept of backward mapping stating that in order to develop sound educational processes from the top or leadership level, it is important to first understand what is important at the bottom or user level. This study will examine the validity of this precept by considering student input on the influence of programs such as Linked Learning on retention, graduation, and dropout rates. An overarching consideration was to determine whether programs of study such as Linked Learning adequately prepared students to find success with postsecondary opportunities.

Aliaga and colleagues (2012) noted, “Old policy frameworks and paradigms cannot be used to consider a topic [CTE] of such critical importance to the nation’s educational and economic well-being” (p. 1). It does appear that California is on the cusp of CTE reform. Senate Bill 1070, calling for legislation to reauthorize and improve the career-technical education pathways initiative, has received majority support from state legislators. California schools must prepare to respond to such legislation with a thorough understanding of how CTE integration impacts student postsecondary options.

The State of California Employment Development Department (EDD, 2014) stated that, from 2012 through 2022, there will be more than more than 8.2 million job openings generated in California. The department reports that during the same 10-year period, the fastest growing occupations are concentrated in Educational Services, Health Care, Social Assistance, Professional and Business Services, and Leisure and Hospitality sectors. Additionally, 44% of the 50 fastest growing occupations from 2012-2022 will require a high school diploma or equivalent, whereas 56% will require a minimum of a
postsecondary nondegree award. The median annual salary of jobs requiring a high school diploma using salary data as of 2014 is $42,315, whereas the median annual salary for jobs requiring a minimum of a postsecondary nondegree award will be $76,328, using the same 2014 salary scale.

**Statement of the Problem**

In 2010, more than one million American students did not graduate from high school, and the loss of lifetime earnings in wages, taxes, and work productivity for just those dropouts totals approximately $337 billion (Perry & Wallace, 2012). The United States continues to lag behind other developed countries in postsecondary attainment when the need for American workers with postsecondary training and credentials is projected to increase (Wachen, Jenkins, & Van Noy, 2011).

**Purpose of the Study**

The specific objective of this dissertation is to determine student perceptions of how core academic programs that are linked with a core academic curriculum and real world experiences in programs of study such as Linked Learning contributed to engagement in high school and readiness for postsecondary life. This study will also seek teacher and administrator perceptions of integrated programs such as Linked Learning and their reactions to data derived from former students. This research will provide insight to educational leaders as they consider the possibility of incorporating a Linked Learning or similarly integrated program.
Research Questions

This study will examine the perspectives of former students from a western urban school district on the impact of integrated CTE and core academic curriculum. Specifically, this study seeks to understand the following questions:

1. How do former students of CTE programs integrated with core academic classes, or Linked Learning, perceive their engagement in high school?
2. What are these students’ perceptions of the impact their integrated CTE and core curriculum or Linked Learning program had on their high school graduation and postsecondary opportunities, both career and college?
3. What are administrators’ and teachers’ perceptions of the impact of integrated CTE programs such as Linked Learning on student engagement, graduation rates, and postsecondary opportunities, both career and college?

Overview of Methodology

In order to develop a more complete understanding of the research questions, this study used a mixed methods design (Clark & Creswell, 2010). This study triangulated findings from interviews, focus groups, and a survey to gain perspective on the research questions (Calfee & Sperling, 2010). A student survey was distributed first, and those findings helped formulate the questions asked during interviews and focus groups. Using this explanatory mixed methods design, the quantitative data provided a general framework for the research questions, and the qualitative responses presented a different perspective, as the researcher analyzed the data in reference to the research questions (Clark & Creswell, 2010).
The urban school district emailed surveys to students who completed a course of CTE study and participated in a specific CTE or Linked Learning pathway. Data from the survey instrument were analyzed and, through that analysis, multiple questions were developed to get a deeper understanding of the quantitative data. The researcher developed a set of mostly open-ended questions considering the quantitative data collected (Clark & Creswell, 2010). The researcher identified those respondents who volunteered to participate in a focus group. The focus group data then helped interpret and provided perspective on other data from this study and helped guide recommendations for later action (Krueger & Casey, 2009). The focus group provided effective insight and was more useful because interviewees came from a similar high school background and the focus group took place in a cooperative environment (Clark & Creswell, 2010). Focus group members were selected from volunteers who completed surveys, and all met at a neutral and nonthreatening environment.

The data from the student respondents were analyzed and the findings helped develop questions intended for district educational leaders. Based on former student participant responses, the researcher interviewed principals from two of the sites identified most frequently by the survey respondents. At the end of the interviews, and based on teacher availability and willingness, the researcher coordinated with site personnel to identify site educators with varying degrees of familiarity and support of CTE and core academic integration to participate in the follow-up focus groups. The researcher scheduled teacher focus groups at the school sites, conducting them on the same day as the principal interviews. After collecting and analyzing data from the site
principals, teachers and other educational leaders, the researcher presented the findings to the district CTE administrators during subsequent interviews.

**Significance**

Although this study covered a relatively short span of time, it will contribute to literature that outlined the importance of longitudinal data to determine program effectiveness. As school districts throughout the state of California and across the United States begin to adjust to new state and federal reform mandates and a changing global environment, data from high school graduates will become progressively more important in determining the direction and focus of public education. The reaction and action taken by educational leaders when presented with this integrated student data could improve educational processes and result in higher student engagement, graduation rates, achievement, and readiness for modern twenty-first century postsecondary challenges.

**Limitations**

The researcher is a CTE teacher and, therefore, may introduce some bias during the qualitative data-gathering and interpretation phases. This potential limitation will be mitigated through the use of prescribed interview and focus group questions that will leave less opportunity for the insertion of any researcher bias.

The researcher will not be able to verify the accuracy of student-reported quantitative survey data regarding attendance, grades, and other performance measures. Possible discrepancies between the actual and reported data may be a limiting factor during the data collection process because the former student respondents will be self-reporting on the survey questionnaires. Sixty-three respondent surveys supplied the quantitative data for the study. A larger number of respondents would have helped
mitigate possible inaccuracies. Because respondents may be more likely to respond to the survey if they perceive success after their high school experience, a volunteer bias was considered (Clark & Creswell, 2010).

**Definition of Terms**

This study will use the following definitions throughout the dissertation:

*Career and technical education (CTE):* Previously referred to as vocational education, a course of study that prepares students for postsecondary education and a career path (Bray, 2002), linking secondary to postsecondary education and training (Stipanovic, Lewis, & Stringfield, 2012).

*Career Pathway:* A multi-year, comprehensive high school program of integrated academic and technical study that is formed around a broad theme, interest area or industry sector (California Department of Education [DOE], 2010).

*Engagement:* A student’s sense of belonging or strength and degree of connection with a school or learning as indicated by the amount of time a student spends actually doing schoolwork, their attendance, active participation in classes, or the extent to which students perceive the relevance of school to future aspirations (Furlong & Christenson, 2008).

*Linked Learning:* A program that brings together a college-prep academic core, a technical core of three or more courses meeting industry standards, and the ability to apply learning through work-based learning, and personalized student supports (Rustique & Stam, 2012).

*Partnership Academy (PA):* A 3-year program, Grades 10 through 12, that provides a college prep curriculum which includes creating a close family-like
atmosphere, integrating academic and career technical education, and establishing viable business partnerships (Stern, Dayton, & Raby, 2010).

**Readiness:** A student’s ability to successfully achieve educational, financial, and personal goals and productively participate in community life (Hoachlander, Stearns, & Studier, 2008).

**Regional Occupational Program (ROP):** Courses that provide instruction for entry-level employment, advanced training, and upgrading skills. Courses are normally limited to occupational areas where there is reasonable expectation for employment or postsecondary articulation and where there is sufficient student interest (San Bernardino County Superintendent of Schools [SBCSS], 2015).
CHAPTER 2—LITERATURE REVIEW

Too many high school students are disengaged from schools that seem out of touch with their lives and course content that is irrelevant to their futures (Bellanca & Brandt, 2010). High school dropout rates have reached crisis proportions, with 70% of all students and 50% of minority students graduating from high school with a regular diploma at the end of their senior year (Swanson, 2009). According to Wagner and Kegan (2006), 41% of the employers of postsecondary students believe that public school graduates have the necessary knowledge, skills, and abilities to do well in the workplace.

The necessary learning outcomes for students attending public secondary education have changed significantly since the beginning of the twentieth century when schools were preparing students to contribute to an industrial-based economy (Bishop & Mane, 2004). Many twenty-first century jobs will require specific technical skills that necessitate postsecondary licenses or certificates (Schwartz, Keppel, & Symonds, 2012), thus requiring a change to secondary educational practices. And yet, many teachers, administrators, parents, and politicians have a “rearview mirror mindset when it comes to what schools should be” (Jukes, McCain, & Crockett, 2010, p. 135). Many secondary students are disengaged with little motivation to succeed in school, much less graduate under the current educational climate and structure. Integrating Career and Technical Education (CTE) with other core academic curriculum classes provides a context through which invaluable academic skills can be developed while simultaneously preparing students for the world of work (Threeton, 2007). Bozick and Dalton (2012) defined core academic courses as math, science, and English. The California Department of Education (DOE, 2010) outlined integration strategies found in programs such as “Linked
Learning,” which possesses 59 pathways to graduating ready for careers and college within 15 industry sectors. Programs such as Linked Learning (LL) have the potential to significantly improve the preparation of students for twenty-first century postsecondary opportunities.

This review of literature examines research related to career and technical education and how an integrated curriculum can effectively engage and retain students, setting them on a course for graduation. The review first considers the history and perceptions of CTE and examines how CTE history impacts the current integration of CTE with core academic subjects, as well as the implementation those integrated programs. Next, the literature review examines research and scholarship regarding the effects of an integrated CTE curriculum on student engagement and retention. Such measures help determine how high schools are preparing students for the challenges of today’s postsecondary life. Finally, the author examines research regarding efforts to implement a new integrated framework through Programs of Study (POS), such as Linked Learning, and the impact of such programs on student achievement.

**History of Career and Technical Education**

Since the beginning of the twentieth century, “federal legislation has attempted to move CTE from a segregated component of the high school curriculum to an integrated element that jointly improves both academic and career readiness” (Bozick & Dalton, 2012, p. 1). At the urging of early twentieth century economists, and in response to continued immigration of manual laborers and the needs of their children, the federal government passed the Smith-Hughes Act of 1917 (Oakes & Saunders, 2008; Perry & Wallace, 2012; Wonacott, 2003). This act focused on improving education for working
class children from less affluent backgrounds, preparing them to contribute to a growing industrial economy (Wonacott, 2003). Although the goals of Smith-Hughes were to provide education for more children, the legislation provided separate funding and expectations for CTE, then known as vocational education, and began to differentiate academic and vocational tracks for students (Grubb, Davis, Lum, Plihal, & Morgaine, 1991).

Hayward and Benson (1993) stated that subsequent policies derived from the Smith-Hughes Act limited students who attended vocational programs to “no more than fifty percent academic instruction” (p. 7). Unfortunately, beginning in the first half of the twentieth century more and more lower-class and immigrant students primarily received specific instruction on one skill instead of exposure to knowledge and skills that would help them learn other more technologically advanced capabilities. The growing practice of tracking students placed into vocational education reinforced the divisions between career and technical education and academic education (Grubb et al., 1991). These practices provided separate courses for college-bound and noncollege bound students. Students categorized on the noncollege bound track often participated in hands-on, real-world education, whereas those believed to have the capacity for college more often received a text-based, literacy-based education (Saunders & Chrisman, 2008). Yet again, these practices have carried a racial, social, and ethnic bias from their beginnings (Grubb, 2008).

Two distinct pathways for public high school students emerged: a core academic or college preparation and a vocational or career track (Aliaga et al., 2012; Perry & Wallace, 2012; Saunders & Chrisman, 2008). As the twentieth century began to unfold,
students who had the aptitude, skills, and resources to go on to college after high school more often followed the core academic track. On the other hand, the educational system tracked students who lacked the skills or resources into the technical or vocational pathway (Grubb et al., 1991; Wonacott, 2003). Although some efforts were made to make CTE more generalized, educational funding, curriculum, teacher training and certification, and student opportunities would function separately through most of the twentieth century (Grubb et al., 1991).

Saunders (2013) pointed out that some educators in the early twentieth century, such as John Dewey, opposed the pressure to primarily prepare students for narrowly focused industrial work while reserving academic education for a select few. Educators such as Dewey believed that “the greater social, economic, and democratic ends of education could be met by linking the vocational and the academic” (Saunders, 2013, p. 7). However, throughout much of the twentieth century, high school vocational or Career Technical Education remained separated from an academic pathway to college. When the Vocational Education Act passed in 1963, vocational education and CTE were already stigmatized as the educational option for students who were less affluent, more likely belonging to racial or ethnic minorities, and were otherwise disadvantaged or at risk of not finishing high school (Aliaga et al., 2011; Hayward & Benson, 1993; Oakes & Saunders, 2008; Wonacott, 2003). Through the mid-twentieth century, Congress increased its leverage over CTE programs and controlled a large percentage of its funding. Aliaga and colleagues (2011) stated that although the federal government occasionally legislated some educational reform at that time, a definite divide continued to exist between CTE and academics. Educators separated students into either a
career-based technical track or an academic pathway based upon their “evident and probable destinies” (Grubb 1995, p. 12). Subsequent amendments to the Vocational Education Act of 1963 occurred in 1968 and again in 1986 continued to address the economic and social demands of America, but kept CTE and academics segregated (Threeton, 2007).

During the last quarter of the twentieth century, policymakers noticed that the proportion of U.S. workers employed in manufacturing began to decrease significantly with the increasing use of automation and computer technology in a more globalized market (Castellano, Stringfield, & Stone, 2003; Farber, 2010; Perry & Wallace, 2012; Threeton, 2007). Kreamer and Derner (2012) reported that in 1983 the National Commission on Excellence in Education Reform stated that the United States would cease to compete in the global economy unless it strengthened its educational system. The report issued, entitled *A Nation at Risk: The Imperative for Education Reform*, sounded an alarm that encouraged education and state and federal policy leaders to redefine expectations and develop a progressive vision for education reform (Kreamer & Derner, 2012). In order to strengthen the American workforce, the 1984 Carl D. Perkins Vocational Education Act created measures to assess the impact of vocational education programs on student achievement.

Congress restructured the Perkins Act in 1990 as Perkins II and placed emphasis on academics, as well as occupational skill development and learning, thus further advancing the integration of CTE with academics (Hayward & Benson, 1993; Threeton, 2007). Other federally supported initiatives, such as the Secretary’s Commission on Achieving Necessary Skills (SCANS) program, the School-to-Work Opportunities Act of
1994, and the Workforce Investment Act of 1998 directed how federal funds were to be used to support state and local CTE programs (Lynch, 2000; Perry & Wallace, 2012). These legislative acts mandated that schools “create partnerships with businesses, community colleges, universities and technical schools” (Perry & Wallace, 2012, p. 37). Additionally in 1998, the next Perkins Act revision known as Perkins III held states accountable for promoting academic and technical performance and the integration of academics in vocational education (Threeton, 2007).

The federal government allocated approximately $1.3 billion for state CTE educational programs when the Carl D. Perkins Career and Technical Education Improvement Act of 2006 (Perkins IV) passed. With it, further incentive and greater accountability were given to the states to insure the integration of CTE and academics (Threeton, 2007). Although Perkins IV addressed the divide between CTE and academic or college-prep curricula, the two have been slow to integrate (Bozick & Dalton, 2012). Castellano and colleagues (2003) observed that CTE and academic staff “do not know each other well, much less collaborate with one another” (p. 249).

At the onset of the twenty-first century, the global environment became digital and improved automation, and computer miniaturization set the scene for more educational adjustments. Perkins IV was part of an effort to keep pace with globalized technological advances that were again threatening American economic stature and stability.

Perkins IV also required all recipients of federal funds to implement at least one Program of Study (POS). The adoption of POS encouraged districts to help more students transition from high school to postsecondary scholastic and workforce
opportunities through CTE programs (Carl D. Perkins Career and Technical Education Act, 2006). Bray, Conneely, Green, and Herbertson (2010) stated that POS in Perkins IV linked “students’ educational experiences through coherent course sequences between the secondary and postsecondary levels” (p. 61). However, not all would agree that goal has been met. Darling-Hammond (2010) noted that other high-achieving nations typically have centralized national education departments that identify basic core values essential to teaching and learning and then continue to refine practices. She went on to state that this structure has often proved to be more effective in achieving positive change.

The United States is not the only country using CTE or vocational education to improve educational outcomes. In 14 European countries, for example, a primary function of CTE is to leave the educational system and be equipped to enter the production system (Stenström, 2000). Stenström (2000) also stated that another function of CTE in Europe is to deliver credentials and prepare students to serve in jobs that are “differentiated both horizontally and vertically” (p. 257). Wu (2003) pointed out that career and technical education fostered the ability of workers to perform self-reliantly, independently, and creatively in their jobs, and to use communication skills effectively, whereas traditional education and apprenticeships failed to fulfill those tasks.

Outside the United States, the Paris-based Organization for Economic Cooperation and Development released a 2010 report stressing the importance of vocational education and training or integrated CTE in advancing many of the same recommendations (Castellano, Sundell, Overman, & Aliaga, 2012). Unlike the United States, vocational education or CTE is more mainstream in other countries, especially throughout northern and central Europe. Nations such as Austria, Denmark, Finland,
Germany, and the Netherlands had between 40% and 70% of young people participate in an educational program that integrates classroom and workplace learning (Stone & Lewis, 2012; Symonds, 2011). Many of these programs culminate in a diploma or certificate that permits the student to directly enter the labor market. These countries use models such as apprenticeships, sustained internships, and school-based programs that incorporate some work-based learning. Over 80% of young adults in these countries found jobs within 6 months of completing their education in 2007 compared to 48% in the United States (Symonds, 2011). Symonds (2011) also reported that in Australia 60% of 11th- and 12th-grade students are involved in a system where blocks of school time are committed to work at sponsoring companies for much of their education. Since countries outside the United States have seemed to embrace a more holistic educational approach, more data may be available to help educators shape a uniquely American answer to educational reform opportunities.

Over the past century, the U.S. Congress has initiated a great deal of CTE legislation and reform, but Stipanovic and colleagues (2012) question whether there has been enough meaningful change. The Office of Vocational and Adult Education (OVAE) still remains a separate subdivision of the U.S. Department of Education. There is minimal standardization across states regarding how they measure and report CTE student performance data (Kotamraju & Mettlle, 2012; Stipanovic et al., 2012). Unlike other countries, many in the United States view career and technical education programs as having competing goals and separate educational requirements. This polarized perspective of CTE and academic curriculums can be found at the federal, state, and local levels within the United States. Perry and Wallace (2012) identified a noticeable gap in
rigorous CTE program evaluation when compared with other academic course offerings. Additionally, a lack of adequate evaluation policies and procedures may be viewed as an area of potential opportunity for CTE programs in general.

In an effort to engage in dialogue around approaches for measuring the performance of CTE programs, the U.S. Department of Education developed the State Perkins Accountability Congress (SPAC) website to help establish guidance to assist states in implementing future Perkins accountability requirements (SPAC, n.d.). This website was intended to be a positive collaborative step toward effective change, but accountability through data analysis is only one aspect of successfully integrating CTE with academics. Collaboration on how to best structure career technical education and academic integration could be significantly augmented by outside sources through virtual means.

The sharing of data between states could improve educational options for many school districts. That may be why the SPAC developed the Common Education Data Standards (CEDS). According to SPAC (n.d.), the goal of the CEDS initiative is to build a coalition of education stakeholders in order to decide on and adopt common definitions, code sets, and technical specifications. The implementation of CEDS is designed to increase the ability to share and compare data between educational entities both within and across state lines at multiple levels (SPAC, n.d.). An expansive database across the nation could provide timely and meaningful information to educational leaders and policymakers.

However, districts within the same state “consistently fail to share high school data—such as student achievement, attendance, and attainment information—with middle
and elementary school leaders” (The Education Trust-West, 2011, p. 5). Developing a new educational paradigm may take years and yet teachers and administrators currently receive minimal, if any, training on how proposed structural changes might be applied to increase student achievement (Jukes et al., 2010). Furthermore, Jukes and colleagues (2010) maintain that public education in the United States does not have the luxury to continue looking internally for ways to better deliver an obsolete education.

Compiling accurate data used to compare students taking a CTE-based curriculum to those on a more academic track can be problematic (Aliaga et al., 2012). Aliaga and colleagues (2012) noted, “classifying students as academic, vocational, general, or dual has only limited value” (p. 1). Students now take varying degrees of CTE classes and are less likely to be placed into either an academic or CTE track.

A potential benefit of integrating CTE with the core curriculum is the increased amount of collaboration that occurs between educators. Teachers from different disciplines collaborate to develop common goals and themes through methods such as project-based and discovery learning. Symonds (2011) stated that “there is a perceived disconnect between the classroom and the ‘real world’” (p. 21). Programs that apply classroom learning to a tangible life experience effectively engage students, increasing skill development, degree attainment, and eventually postsecondary job success (Stone, Alfeld, Pearson, Morgan, & Jensen, 2006; Symonds, 2011).

**Engagement and Retention**

Educational researchers identified student engagement as one of the primary indicators of high achievement in school (Park, Holloway, Arendtsz, Bempechat, & Li, 2011). Newmann (1992) defined engagement as active involvement in learning, in
contrast to uninterested or apathetic participation. Covell, McNeil, and Howe (2009) characterized engagement through students’ rights respecting behaviors and significant interactions for participation. Fredricks, Blumenfeld, and Paris (2004) noted the behavioral component as well and further described engagement as a complex concept that included attitudinal and cognitive components. Although there are different interpretations of what student engagement may be, the resultant of these various elements may be most evident in overall student performance or success. Stone and Lewis (2012) recognized the various aspects of engagement could create a synergistic effect and would be evident in high school graduation rates.

Students who may need extra academic and social support have sometimes found some of the nation’s large, one-size-fits-all high schools impersonal, inflexible, and more often an obstacle to their success (Saunders & Chrisman, 2008). Some of the elements that shape engagement in learning include social and cultural influences related to gender, race, family, religion, and socioeconomic status (McInerney, 2012). A nation comprised of immigrants from multiple corners of the globe, the United States has a broad range of social and cultural influences. Engaging such a wide array of individuals can be wrought with challenges. Countries such as Switzerland have been able to keep their students engaged through upper-secondary or high school. In that country, 30% of Swiss companies are directly involved in providing apprenticeships, and two-thirds of upper secondary students enroll in CTE classes. Students there graduate their upper-secondary school at a rate of 90% (Symonds, 2011). Some educators, policymakers, and researchers proposed that integrating CTE with core academic classes will help schools increase engagement while decreasing dropout rates, especially for students needing additional
support (Grubb, 2008; Richmond, 2010). Although studies have come to various conclusions regarding this claim (Bozick & Dalton, 2012; Castellano et al., 2007; Castellano et al., 2012; Kotamraju & Mettille, 2012; Plank, DeLuca, & Estacion, 2005), a growing body of evidence does suggest that integrating CTE with academics positively affects student retention and graduation rates while reducing dropout rates (Bozick & Dalton, 2012; Darling, Caldwell, & Smith, 2005; Stone & Lewis, 2012). Ensuring students are engaged and encouraging them to develop school-oriented friendships may help decrease dropout rates (Ream & Rumberger, 2008). Additional data are needed to account for the lack of qualitative research incorporating the voice and perspective of students regarding the effectiveness of CTE integration (Perry & Wallace, 2012; Stipanovic et al., 2012).

Although students learn basic skills in high school, they do not care as much about the content or use critical thinking to explain the greater significance of what they learn (Grubb, 2008; Wagner, 2010). Disconnected learning disengages students and undermines comprehension (Grubb, 2008). Wagner (2010) reported that schools were never designed to teach every student how to think, so making individual personal connections to the curriculum was never an intrinsic school function. Grubb (2008) stated that conventional high schools did not adequately motivate students by offering opportunities for them to actively plan for potential future work assignments.

Minority students run a higher risk of disengagement and dropout than their White peers (Ream & Rumberger, 2008). A higher percentage of low-income, African American, and Latino students became disengaged and were placed into remedial courses and CTE (LaFors & McGlawn, 2013). On the other hand, middle-class students from
English-speaking homes whose parents had college experience more often remained engaged and took college prep classes (Rattay, 2008).

Castellano and colleagues (2012) examined the impact of POS on high school academic and technical achievement. The researchers conducted a 2-year mixed methods longitudinal study comparing students who integrated CTE into a POS with a control group that did not follow a POS. Castellano and her colleagues did not find a significant difference in achievement after the first year when the students were in ninth grade. However, during the following year of data collection, 10th graders participating in an integrated CTE curriculum were significantly more on track to graduate as compared to the non-POS students. The research article did not report data from subsequent years, but projected a continued positive trend for students in a CTE Program of Study (Castellano et al., 2012).

In order to demonstrate the efficacy of integrated CTE programs on student success, high school achievement data must be compared to postsecondary data, such as student job acquisition or college attendance and graduation. Perry and Wallace (2012) noted:

Establishing a uniform base of quality assurance metrics and outcomes tracked longitudinally would enable stakeholders to not only show that these programs work, but also allow them to understand why and how they work, including ways in which they can be improved and replicated. (p. 40)

Data derived from such studies should help direct future educational planning and funding allocation.
Longitudinal studies, which compile data from a cohort over an extended period of time, have been conducted to measure the impact of integrated CTE programs on student engagement and achievement. However, since a great deal of the current CTE integration occurred after Perkins IV in 2006, most integrated CTE programs began no earlier than the 2007-2008 school year. Alfeld and Bhattacharya (2013) pointed out that integrated CTE pathway programs are “so new that longitudinal research exploring their nature and impact on student education and career outcomes has been lacking” (p. 2). Therefore, most completed longitudinal studies could only begin accumulating data in 2008. Nonetheless, the limited longitudinal data that have been collected indicate a favorable relationship between integrated CTE programs of study and improved student performance and outcomes (Alfeld & Bhattacharya, 2013; Bishop & Mane, 2004; Castellano et al., 2012; Hoachlander et al., 2008).

The limited longitudinal research on technical and core academic integration that has been conducted identified positive outcomes. Bishop and Mane (2004) analyzed 12 years of international longitudinal data in a quantitative study designed to examine the correlation between high school completion rates and subsequent earnings for students who had the opportunity to pursue a CTE in high school. The researchers found that students who had the option to begin preparation for their career of choice by taking CTE courses experienced better attendance and higher earning potential. LaFors and McGlawn (2013) noted that schools with integrated CTE programs had higher graduation rates than schools from surrounding districts that did not operate an integrated program. Additionally, Bridgeland, Dilulio, and Morison (2006) reported that 81% of dropouts stated that they might have remained in school if there had been more real-world learning.
These studies supported the strategy of linking classroom and real-world learning as an effective combination that can motivate students to remain in and graduate from school.

Alfeld and Bhattacharya (2013) conducted a mixed methods study of students in order to provide preliminary evidence on whether and how CTE programs of study (POS) affect students. The researchers studied 213 high school juniors and seniors enrolled in POS at three different sites from 2009-2012. Both qualitative and quantitative data were initially collected in 2009, with subsequent data gathered from 65% of the original participants in June 2012. The majority of student respondents reported that POS motivated them to stay in school and that the program better prepared them to make choices about college or career. Findings also suggested that the number of dual credits (credits from the same class that applied to both college and high school) earned, as well as the POS student’s attitude towards their chosen career, had a significant effect on college outcomes (Alfeld & Bhattacharya, 2013).

Hughes, Rodriguez, Edwards, and Belfield (2012) also looked at the effects of dual enrollment on student achievement in a 3-year longitudinal study. This program, referred to as the Concurrent Courses Initiative (CCI), was designed to improve high school and college outcomes for low-income youth by establishing career-themed pathways from secondary to postsecondary education. Hughes and his researchers studied eight secondary-postsecondary partnerships in California and found that students who participated in dual enrollment programs were more likely to graduate from high school, more likely to persist in postsecondary education, and accumulated more college credits than comparison students.
Bozick and Dalton (2012) researched the relationship between CTE and math achievement at the beginning of the twenty-first century. The researchers noted that a balance of academic and CTE courses within a student’s schedule is an important concept to understand the potential impact of an integrated curriculum. Bishop and Mane (2003) stated that giving students the option of choosing CTE courses increased student retention and graduation rates. Plank (2001) found greater gains for students who focused only on academic courses compared to students who concentrated only in vocational courses and students who concentrated on both. Other studies analyzing the impact of integrated curriculums found that an integrated curriculum has a more positive impact on student achievement than a strict vocational curriculum (Agodini, 2001). Agodini and Deke (2004) then found that for students with no college plans who were interested in a vocational education, the probability of dropping out of school fell from 19% to 16% when concentrating in vocational education instead of exploring other academic options.

Stone, Alfeld, and Pearson (2008) noted that many students were disengaged in class and believed that some subjects they learned in school were “not relevant to life after high school” (p. 769). The researchers used a mixed methods design to test a model for improving mathematics instruction in five high school CTE programs. Those programs included agriculture, auto technology, business and marketing, health, and information technology. The study encouraged CTE teachers to apply algebraic formulas learned in math class to an actual CTE project. The goal was to help students develop a better understanding of an abstract concept (the algebraic formula) by presenting it in an occupational context (the CTE class project). Applying abstract concepts through project-based learning projects may help increase student comprehension (Saunders &
The researchers randomly assigned the volunteer CTE teachers to either an experimental or control group. The experimental group collaborated with math teachers to develop CTE instructional activities integrating mathematics into their CTE curriculum. After 1 year, the experimental group’s students “performed equally on technical skills and significantly better than control students on two standardized tests of math ability” (Stone et al., 2008, p. 767).

Educator collaboration may not always be present with an integrated CTE curriculum. Blending curriculums through integrated curriculums and project-based learning may help some students understand more abstract concepts. Caine and Caine (1991) explained that all knowledge is embedded within other knowledge. Bond and Navarra (2012) stated that allowing subjects to overlap, while integrating them into a singular curriculum, could provide a better, connected understanding for students. However, vocational education and CTE courses may help to reengage students because occupational courses focus more on applied skills and preparing students to succeed in the labor market (Agodini & Deke, 2004). Plank and colleagues (2005) found that students who earned zero or fewer CTE credits had a higher probability of dropping out than did those who took a ratio of approximately more than three CTE classes to four core academic credits.

Hearst-Blowe and Price (2012) conducted a study to investigate the academic performance of CTE and non-CTE students on Virginia standardized achievement tests, as well as graduation rates. The study intended to “determine whether CTE is a viable program that can contribute to the academic proficiencies” (Hearst-Blowe & Price, 2012, p. 7). In the study, a CTE student is defined as one who has two sequential elective or
CTE classes. The study used data from high school graduates in 2008, 2009, and 2010, totaling more than 110,000 CTE graduates. Hearst-Blowe and Price found that CTE students had a mean pass rate of 9 percentage points higher than non-CTE students on criteria referenced standardized math tests during the 2009-10 school years. Career Technical Education graduates also scored 7% to 8% higher on the Grade 11 English reading test. Finally, “CTE students graduated at an average graduation rate of 96%, whereas the average non-CTE cohort graduation rate was 87% for the three academic years of the study” (Hearst-Blowe & Price, 2012, p. 7). The results of this study indicated that students who complete sequenced CTE courses demonstrated higher mathematics and reading scores, as well as improved graduation pass rates.

It is important that integrated CTE programs of study prepare students for college, as well as career. However, there has been doubt cast upon whether students are actually ready for college-level classes after receiving a high school diploma. There has been a growing need for first-year college students to receive remediation in subjects such as math and English. Too many students do not smoothly progress through nor graduate from college. The National Center for Educational Statistics (NCES, 2014) reported that 59% of first-time, full-time students seeking a bachelor’s degree actually complete that degree within 6 years, while the same source found that 31% of full-time undergraduates completed a certificate or associate’s degree within 150% of the normal time required.

Markedly less research focuses on the causal effects of CTE legislation; more specifically, the effects that programs derived from that legislation have on American student outcomes (Bozick & Dalton, 2012). The fact that many previous studies conducted did not contain a purely random sample may contribute to this disparity.
Stone and Aliaga (2007) pointed out that a stigma based on race, gender, ethnicity, and social class affects CTE enrollment. Therefore, a significant percentage of students who take CTE courses tend to have fewer socioeconomic resources, less educated parents, are more likely to be African American, or live in rural areas (Stone & Aliaga, 2007).

Regardless of background, 92% of U.S. public high school students took CTE courses at some level (Aliaga et al., 2012). The input and feedback of these stakeholders must be seriously considered. Recommendations from a large body of research support the provisions as set forth in Perkins IV and project student success with more complete CTE integration. Although not conclusive, previous research cumulatively suggests some value to CTE participation in student engagement and persistence in high school.

Gaunt (2005) found that the reasons why 92% of U.S. public high schools took CTE courses varied. His research concluded that 70% of his student respondents indicated that the people who had the greatest influence on their enrollment in a CTE course were their friends, 61.9% by their mother, 57.7% by their father, and 52.4% by the staff. However, Gaunt’s survey asked 451 high school seniors people who influenced their decision to take a CTE course, but did not list other influences on CTE course choice decisions, such as the ability to train for a job or acquire skills in an industrial sector.

States have begun to realize the potential of an integrated CTE curriculum. In 2005, the California State Department of Education released a new CTE framework that focused on student preparation for work, as well as college (Richmond, 2010). In order to maximize the positive impact that CTE and academic integration could have on student achievement, reformers must better understand the student’s perspective.
The Linked Learning Option

Many California high schools have already committed to using Linked Learning to help engage students and improve achievement levels (Hoachlander et al., 2008; Rustique & Rutherford-Quach, 2012). Hubbard (2012) described Linked Learning as a reaction to earlier vocational education models where “students who were interested in a trade were placed in a track that immediately disqualified them from taking college prep classes” (p. 3). Linked Learning is a statewide initiative launched in 2008, accessible to all students and designed to improve high school achievement by connecting rigorous academics to career-based pathways (Richmond, 2010; Rustique & Rutherford-Quach, 2012). Enrollment in Linked Learning provides students with a 4-year program that integrates academic courses with career, technical, and twenty-first century skills (Rustique & Stam, 2012). One of the main goals of Linked Learning is to encourage students to build skills and competence in any of California’s 15 major industrial sectors; from areas such as Agriculture and Natural Resources, Engineering, Energy and Utilities, Health Science and Medical Technology, and Transportation (Hoachlander et al., 2008).

Linked Learning is an integrated approach designed to combine rigorous academics with career-based learning and real world workplace experiences (Saunders, 2013). It can be implemented through methods including theme-based smaller learning communities, career academies, Programs of Study (POS) and multiple pathways, such as Partnership Academies (PAs; Grubb et al., 1991; Saunders & Chrisman, 2008; Stipanovic et al., 2012). These strategies provide a structure that may improve attendance, graduation rates, and more effectively prepare students for both college and career opportunities (Castellano et al., 2012; Hoachlander et al., 2008). The intent of
Linked Learning is to motivate students through the linking of core curriculum to CTE pathways such as engineering, health care, performing arts, law, and more. Rustique and Stam (2012) pointed out that Linked Learning provides four primary components:

1. A college prep academic core that satisfies course requirements for entry into California’s public colleges and universities while emphasizing real-world applications,

2. A technical core of four or more courses meeting industry standards,

3. Work-based, real-world learning opportunities, and

4. Student support services (academic, emotional and social, college and career guidance). (p. 2)

LaFors and McGlawn (2013) stated that the Linked Learning program bridges the gap between a rigorous college and career preparation curriculum. It also offers student-centered services that help ensure students are ready for both career and college. High schools implement Linked Learning through a variety of approaches, including Partnership Academies (PAs), small learning communities, industry/career majors in large high schools, career academies, charter schools, and small, themed high schools in traditional school districts (LaFors & McGlawn, 2013; Saunders & Chrisman, 2008).

There are over 500 career partnership academies funded by the state of California. These academies are small learning communities within larger high schools where students at each grade level take several common classes together, including core academic classes and a career-based technical class related to the academy’s theme (Parsi, Plank, & Stern, 2010). Partnership Academies have operated in California for more than two decades and are a well-developed model that have been using the Linked Learning approach to
education (Stern et al., 2010). Themes must be flexible and adjust to the changing needs of the community, students, and teachers (Saunders, 2013).

Hubbard (2012) conducted a qualitative research study on the implementation of Linked Learning with eight schools in five California school districts. The research identified inconsistencies in the rate of success each school experienced during the implementation process. Hubbard described the process as socially construed, dependent upon the context of the school, district, and surrounding community. Principals implementing Linked Learning programs faced technical, staffing, and master scheduling challenges, but appreciated having experienced consistent mentors along with district support. The researcher found that the administrators and educators canvassed in the study all believed that Linked Learning “holds promise for their students” (p. 26), but there are still many challenges to overcome for both district and site leaders (Hubbard, 2012).

High school students are attracted to Linked Learning schools for a variety of reasons. For example, only 10% to 20% of students in a Los Angeles city high school chose that particular high school because of its theme. Instead, Saunders (2013) reported that students and parents made their school choice for other reasons, such as perceived safety, instructional strategies and personalization. Students indicated they enjoyed learning in nontraditional ways through doing, creating projects, working collaboratively, and demonstrating their learning through other means (Saunders, 2013).

Although many studies did not provide only positive reports on Linked Learning, there were significant data supporting the reform. LaFors and McGlawn (2013) studied four Linked Learning schools and three school districts to see how the program was
implemented and how it affected postsecondary student preparedness. The researchers utilized focus groups, surveys, interviews, student outcome data, and transcripts in their mixed methods study. LaFors and McGlawn found that the four schools embraced common practices that contributed to student success, mitigated or eliminated traditional high school obstacles to student success, and enabled students to graduate at higher rates. Principals have also reported that attendance among Linked Learning students was better and their motivation higher when compared to other students at their school (Hubbard, 2012).

Rustique and Rutherford-Quach (2012) conducted a case study of the Porterville School District. Located in the San Joaquin Valley of California, Porterville is a rural, blue-collar region whose district is composed of 74% Hispanic students. The Linked Learning model “especially focused on helping close the opportunity gap for high-need populations such as Porterville’s” (p. 5). Linked Learning was instituted in Porterville through a deliberate process. The district created a dedicated district Linked Learning team whose sole purpose was to provide guidance and support to leaders at every school site. After the community and district bought in to the strategy in 2008, students in Porterville’s five high schools enrolled in one of the nine pathways offered. Now in its fifth year after initial implementation, the community and its students better understand the Linked Learning program. Students enrolled in a career pathway had a higher Academic Performance Indicator (API) than nonpathway students. Also, the number of students involved in work-based learning opportunities increased from 10% to 90% in 4 years. Porterville’s pathway students also outperformed the entire school in the California Exit Exam (CAHSEE) for math and English language arts. The findings in
this study reinforced support for Linked Learning and demonstrated the effects of increased stakeholder buy-in. Consistent district and community Linked Learning promotion and support helped increase student performance in Porterville (Rustique & Rutherford-Quach, 2012).

Saunders, Rogers, and Terriquez (2013) conducted telephone surveys with 500 graduates from nine Linked Learning pathways. The majority of the Linked Learning alumni respondents graduated high school between 2006 and 2010. The comparison group consisted of 1,175 randomly selected public high school graduates from the classes of 2006-10. Saunders and her colleagues then conducted follow-up interviews with a smaller sample of 50 Linked Learning survey respondents. The researchers found that in 2011, approximately 85% who entered Linked Learning sites as freshmen graduated high school compared to 76% of students throughout the state of California (Saunders et al., 2013). These statistics are even more impressive considering a larger percentage of Linked Learning pathways students were classified as “at risk,” minority students, from a lower socioeconomic background.

Saunders and colleagues (2013) also found that Linked Learning alumni were more likely to attend either community college or a 4-year institution instead of opting out of college or vocational school. There was no statistical significance regarding the likelihood of either group of graduates being employed at the time of the survey. Both groups of respondents were as likely to have employer-provided health insurance. Additionally, Linked Learning graduates who participated in work-based experiences while in high school were more likely to have attended some sort of postsecondary education. The researchers also found the qualitative data agreed with the study’s
quantitative data. During interviews, Linked Learning alumni reported their high school experience helped prepare them for college and career. Finally, Linked Learning respondents stated that they learned to navigate through new settings and seek assistance when needed to help secure their success (Saunders et al., 2013).

Saunders (2013) stated that Linked Learning “unifies the various parts of the curriculum primarily through the theme and the instructional strategies that theme inspires” (p. 23). Combining a college-preparatory curriculum with a career theme, such as health care, communications media, or transportation technology, gives students the option to apply academic theories and ideas to work-based learning opportunities (Stern et al., 2010). Linked Learning prepares students to succeed in college and career, not one or the other. Students who successfully complete a Linked Learning pathway should possess the knowledge and skills to compete and contribute in the workplace and sustain and advance their careers (Saunders & Chrisman, 2008).

Guha and colleagues (2013) conducted an evaluation report for nine districts that developed Linked Learning systems. The study’s goal was to examine student experiences and to assess progress toward reaching system and student-level goals. The study based its results on interviews, focus groups, and a student survey. Twenty-three percent more students engaged in a Linked Learning pathway reported they were more prepared to work in a group to achieve a shared goal and were better prepared to learn difficult content. The study also found some evidence that students in certified pathways were 7% more likely than their nonpathway peers to remain in their district through the 11th grade. These figures may suggest that Linked Learning may be more likely to engage students so they are more motivated to stay in school.
Curriculum Development

The Common Core State Standards are defined as “end-of-year expectations and a cumulative progression designed to enable students to meet college and career readiness expectations no later than the end of high school” (National Governors Association Center for Best Practices [NGACBP] and Council of Chief State School Officers [CCSSO], 2010). With the introduction of Common Core State Standards (CCSS) scheduled for the near future in many states, the Linked Learning pathways approach could provide an implementation format for high schools (Rustique & Stam, 2012). Bozick and Dalton (2012) describe CCSS as a “set of academically focused benchmarks in math and English developed by the National Governors Association and the Council of Chief State School Officers” (p. 2) currently being implemented in 48 U.S. states and territories. Linked Learning and CCSS both emphasize real world applications and, therefore, could be quite complementary (Rustique & Stam, 2012). Since California adopted CCSS for English language arts (ELA) and math, the state’s department of education revised CTE standards previously written in 2005 to align CTE programs with the CCSS standards (McLean & Ong, 2013). Because of this alignment, when implementing the CCSS, teachers could quickly locate standards that are common to both the ELA or math class and the associated CTE class. Career Technical Education and core academic teachers could then collaborate and develop coordinated curriculums that apply the standard to two different lessons. Students would then be able to apply a theoretical construct to a real world application. Although studies on the impact of an integrated CTE/academic approach, such as Linked Learning on student achievement are inconclusive (Bozick & Dalton, 2012; Hoachlander et al., 2008; Richmond, 2010), some
researchers indicated that this integration had a positive effect on student achievement (LaFors & McGlawn, 2013; Rustique & Rutherford-Quach, 2012).

The advent of the CCSS opened a window of opportunity for other educational reform legislation. California Senate Bill 1458, signed into law in September 2012, will also impact how each school’s performance is evaluated beginning in 2016. Beginning that year, in accordance with the new law, 60% of a school’s Academic Performance Index (API) will rely upon data from standardized tests such as the Smarter Balanced Assessment. The remaining 40% will be determined by the State Board of Education, but must include graduation rates and other college and career readiness indicators (California Legislative Information, 2012). These sweeping educational reforms will likely precipitate change and encourage schools to evaluate how they structure and coordinate their curriculum.

Saunders (2013) explained that an integrated curriculum could enhance student motivation. She also added making the curriculum relevant helped to drive course design and project-based educator planning. Since one of the tenets of Linked Learning is to connect students with their communities and have them interface with adults from various industries and careers outside the classroom (Rustique & Stam; 2012, Saunders, 2013), curriculum development would likewise need to extend beyond the classroom and be relevant to the students.

The manner in which educators collaborate may vary from school to school. Saunders (2013) stated that the seed for collaboration often begins informally and opportunistically. Teachers may find that they enjoy working with one another, have overlapping content areas or standards, or their classrooms are strategically located next
to each other. In any case, once the initial cross-curricular collaboration begins and integrated projects develop, teachers and principals agreed that official or school-sanctioned support was necessary (Saunders, 2013). Support might include resources, scheduling or professional development.

Financial Considerations

Parsi and colleagues (2010) pointed out that, despite enduring an unprecedented financial crisis, many school districts in California still implemented Linked Learning. Estimates at the site level for Linked Learning programs are $1,500 per student per year, with funding coming from grants from local and state foundations, local occupational and industrial businesses, and donations from other community members (Parsi et al., 2010). Perry and Wallace (2012) stated that in 2010 more than one million American students did not graduate from high school. Their research also determined that the lost lifetime earnings for those dropouts approximated $337 million. High school dropouts contribute approximately $300,000 less to society than the average high school graduate (Symonds, 2011). Jobs for high school dropouts have disappeared, so they are twice as likely to be unemployed and, when they are employed, earn 37 cents for every dollar that a high school graduate will earn (Ream & Rumberger, 2008; U.S. Department of Labor, Bureau of Labor and Statistics, 2010). During the 1970s, the United States had the highest high school graduation rate amongst industrialized nations, but has since fallen to 13th (Symonds, 2011). The earnings gap between those with a high school education and those with some sort of postsecondary degree has widened, and practically all well-paying middle skill jobs of the twenty-first century will require some postsecondary education (Symonds, 2011; Wachen et al., 2011). Symonds (2011) reported nearly two-thirds of
jobs through 2018 would require that workers have at least some postsecondary education. Wachen and colleagues (2011) further explained that students who went on to earn at least one college-level credit and an occupational certificate earned substantially more than those who chose not to continue their education after high school. Bishop and Mane (2004) reported that students who devoted approximately one-sixth of their time in high school to an occupation-specific course “earned at least 12% extra one year after graduating and about 8% more seven years later” (p. 381).

Employers may also be interested in investing in schools participating in programs that integrate career skills with academic curriculum. Linnehan (1996) found evidence that students who graduated in programs that integrated career business skills with academics had better work attendance and job performance. In Linnehan’s study, high school grades were significant predictors of job performance, and attendance in high school provided a strong indication of postsecondary job attendance.

**Mentorship**

Hubbard (2012) found that Linked Learning principals valued having veteran principals available to discuss how to best lead their schools. Administrative mentors help their colleagues troubleshoot problems, conduct walkthroughs to build teacher support and capacity, and become better instructional leaders. Hubbard reported that administrative mentors significantly helped less experienced Linked Learning leaders build leadership capacity. Although many principals extolled district support and coaching during Linked Learning transition periods, district support has not always been consistent or effective. Principals reported that they benefitted when Linked Learning coaches and advisors provide coherent and coordinated guidance, discussing varied
leadership perspectives and other ideas grounded in the coach’s history and experiences (Hubbard, 2012).

Saunders (2013) reported that administrators of successful Linked Learning sites utilized distributed leadership and encouraged a collaborative and supportive environment for the teachers. Administrators may, therefore, require specialized training on how to increase teacher collaboration, allocate time for teacher training, budget for necessary resources, and hire staff members who best fit in to the desired environment. Mentoring educators to lead the integration of technical and core academics must be a high priority for the planning, implementation, and maintenance of a Linked Learning program.

**Conclusion**

This study examines perceptions of the impact of Linked Learning and pathways educational approaches on student retention, motivation, and postsecondary preparation. In order to develop a better understanding of the research topic, data on perceptions must be collected over an extended period of time. The full impact of high school experiences may not be completely realized within the first years after graduation. Symonds, Schwartz, and Ferguson (2011) argued that educational systems must account for student success beyond a university education or immediate postsecondary employment. Therefore, in order to adjust high school experiences to better prepare graduates for success, it is critical to employ longitudinal studies that retrieve student data well beyond the first few years after high school graduation.

The literature review conducted by the author found studies that examined the effects of integrated academic programs on student graduation rates and postsecondary
opportunities. Although these studies were inconclusive, many seemed to suggest that programs that integrate core academic and CTE such as Partnership Academies and other Linked Learning strategies could have a positive impact on high school student outcomes.

The literature review also revealed a limited amount of research considering student perceptions of the effects of other factors, such as student engagement while in high school and the degree of their readiness for postsecondary opportunities. After appropriate analysis, data from that research, combined with input from other educators, could help educators more accurately analyze how effectively the current system is preparing high school students for postsecondary opportunities. Insight from students throughout the United States already functioning in an established integrated CTE structure must be considered. The data students provide could also be an important key in determining if the structure and organization of integrated programs already in place are adequately aligned with the skills and knowledge they need to thrive and succeed in the twenty-first century. Therefore, a primary goal of this study was to increase the understanding of student perceptions on the effectiveness of programs such as Linked Learning that integrate CTE and core academic programs.
CHAPTER 3—METHODOLOGY

After reviewing the historical background of Career Technical Education (CTE), it was clear there were current perceptions of its value that originated from a culture and mindset that separated technical, hands-on education from what was considered more academic instruction. That mindset established racial, social, and ethnic biases and stereotypes that still exist today (Grubb, 2008). The literature review also revealed that the separation between CTE and core academics was not as evident in other countries as it appeared to be in the United States. These foreign countries took a more holistic approach to education, merging classroom and business environments (Symonds, 2011). However, an increasing number of school districts across the United States have adopted a strategy to integrate technical real-world activities with core academic instruction (Saunders, 2013).

Although findings on the efficacy of Linked Learning were not conclusive, a significant number of researchers identified positive outcomes associated with the blending of technical and core academic education (Castellano et al., 2012; Hoachlander et al., 2008). Some of these benefits included increased engagement and graduation rates and a reduction in the number of high school dropouts (Richmond, 2010).

Linked Learning was designed to bring together rigorous academics, career and technical education, and real-world experiences to help prepare students to compete in a modern fast-paced technological society. Many educational institutions at the federal, state, and local levels throughout the United States responded to that need by allocating resources to programs that applied concepts from core academic subjects to real-world scenarios (Bozick & Dalton, 2012; Saunders, 2013). Educational institutions within the
United States began programs such as Linked Learning decades ago, but especially after the Perkins IV legislation in 2006 (Stone & Lewis, 2012). Although evidence was not conclusive, the effectiveness of integrating CTE and core academic programs would be better understood through longitudinal data. However, until more longitudinal data become available, seeking input from students, teachers, and administrators could provide insight into the efficacy of integrated CTE and core academic programs.

The overarching question that this study brings forth was: What are student perceptions of the benefits of CTE and academic integration such as Linked Learning? Specifically, this study seeks to answer the following questions:

1. How do former students of CTE programs integrated with core academic classes, or Linked Learning, perceive their engagement in high school?
2. What are these students’ perceptions of the impact their integrated CTE and core curriculum or Linked Learning program had on their high school graduation and postsecondary opportunities, both career and college?
3. What are administrators’ and teachers’ perceptions of the impact of integrated CTE programs such as Linked Learning on student engagement, graduation rates, and postsecondary opportunities, both career and college?

In order to develop a more complete understanding of the research questions, this study used a mixed methods design (Clark & Creswell, 2010). This study triangulated findings from interviews, focus groups, and a survey to gain perspective on the research questions (Calfee & Sperling, 2010). A student survey was first distributed, and those findings helped formulate the questions asked during interviews and focus groups. Using this explanatory mixed methods design, the quantitative data provided a general framework
for the research questions and the qualitative responses presented a different perspective as the researcher analyzed the data in reference to the research questions (Clark & Creswell, 2010).

**Participants**

Study participants consisted of high school students who graduated within the last year, as well as current teachers and administrators from high schools where those students graduated. Additionally, the former students surveyed graduated from high schools with integrated CTE and academic or Linked Learning programs. The identified high schools were from a large urban school district in the western part of the United States, henceforth referred to as the Grand Union School District (GUSD). Pseudonyms were also used in this report to identify the two high schools from which the teachers who participated in the focus groups, as well as their principals, came from. Those two high schools will henceforth be known as Casa Grande High School (CGHS) and Alexander Graham Bell High School (AGBHS).

The Grand Unified School District served a diverse student population representing 15 ethnicities and more than 60 languages and dialects. At the time the research was conducted, the district had 16 general education senior high schools. Of those schools, all offered CTE classes, seven had partnership academies, and two were further divided into smaller, more specialized, themed high schools. The high schools within the GUSD integrated course curricula using a variety of methods. Some schools followed the Linked Learning approach while others integrated classes less formally, using project-based learning when it was deemed appropriate. Therefore, respondents
and participants in this study experienced the integration of CTE and other courses at varying degrees of intensity and at different stages of implementation.

The GUSD district-wide graduation rate for the Class of 2010 was 78.1%, higher than for students in the state as a whole. The overall dropout rate for the same cohort class was 9.1%, while the percentage of students who graduated from the district in 2010 with the coursework necessary to apply for admission to a state university was 43.3%, higher than the rate of 36.3% for students within the state. Dropout percentage rates for African American and Latino students were three times as high as White and Asian/Pacific Islander dropout rates. The average daily attendance within the district fell by slightly more than 11% over the school years 2003-04 to 2010-11. In 2010-11, the district enrolled 45.6% Latino, 23.9% White, 14.8% Asian/Pacific Islander, and 11.3% African American students. Racial isolation in traditional public schools throughout the state was more the rule than the exception, and most other schools within the state did not mirror this degree of diversity.

The GUSD noted that enrollment in district-operated schools declined by 12% from 2002 through 2011. At the same time, charter school enrollment has increased by 76%. Additionally, 65% of the district’s students were eligible for a free or reduced lunch and, therefore, classified as students from disadvantaged households. By comparison, 56% of California’s students were classified as disadvantaged. Twenty-eight percent of the GUSD student population was classified as English Language Learners (ELLs).
Students

The student study participants came from a list of high school graduates who took high school CTE courses within their last 2 years of high school. More specifically, the study participants completed a minimum of three CTE courses, many within the 15 career pathways offered through the district. Since Congress instituted the Perkins Act, the GUSD e-mailed a survey to more than 2,000 former high school CTE students once or twice every school year. The school district collected the data in order to submit bi-annual reports in compliance with the Perkins Act. Former student participation in the survey was voluntary.

Site Administrators and Teachers

The researcher analyzed the data to determine the three high schools from which the highest numbers of students surveyed indicated they attended. The district CTE office helped coordinate the meeting between the researcher and a group of educators at two of the sites identified by a large percentage of respondents. Through the coordinated efforts of the district CTE office, the researcher scheduled a focus group with teacher volunteers who represented different perspectives and various disciplines, from CTE to core academic teachers. All focus group teachers were familiar with CTE programs. After conducting a focus group at each site, the researcher individually interviewed each principal from the same two high schools. The researcher presented data taken from the former student surveys to the teacher focus groups and the principals in order to record and incorporate their perspectives on the data.
Career Technical Education Director

Because the nature of the study specifically centered on integrating CTE with core academics, it was important to consider the perspective of the district’s CTE director. The director, who oversees the district’s Linked Learning program, was in a unique position to provide perspective on the data. Therefore, after all data were collected and initially analyzed, the researcher interviewed the District CTE Director based on the survey results. Qualitative data from this interview (Appendix A) was used to provide perspective on all previous study data (Calfee & Sperling, 2010).

After establishing the study design and beginning the execution phase of those plans, the District CTE Director left the district for a position at a different district. A new GUSD CTE director was not hired for several months. The researcher conducted all other requisite interviews and focus groups, reviewed and prepared the initial data analysis, and then interviewed both the former and the current GUSD CTE directors.

Instruments and Data Collection Procedures

The researcher developed the survey questions based upon the study’s literature review. Questions were designed to identify how each element of an integrated CTE and core academic programs such as Linked Learning were relevant to student perceptions. The survey focused on student perceptions of how the elements of core academics, CTE classes, and work-based learning each contributed to engagement. In addition, the survey questions sought student perceptions on how their integrated CTE/core academic or Linked Learning experience prepared them for postsecondary opportunities. This instrument collected graduate perceptions of the impact of CTE/Linked Learning on their high school and post-high school experience. The survey collected background
information on respondents’ current educational and employment status. The survey contained 20 questions addressing two broad themes identified from the literature review: Engagement and Readiness factors (see Appendix B for question alignment).

Student engagement was defined as a student’s ability and desire to remain actively involved in school classes and activities (Newman, 1992). For the purposes of this study, engagement was determined by the information former students provide regarding their attendance, school performance, and grades. The study sought to examine the influence that an integrated CTE and core academic program had on the student’s high school engagement.

Social and cultural factors could also influence a student’s degree of engagement (Mclnerney, 2010). Therefore, under the theme of engagement, this study explored student social and cultural support during a student’s secondary education and its impact on engagement and the overall satisfaction of their educational experience. The survey contained questions asking former students to indicate how social and cultural factors influenced their decision to enroll in CTE courses.

Readiness was defined as a student’s degree of preparation for postsecondary success. It could be measured through the student’s application of skills learned in high school to their post-high school experiences. Another goal of this study was to examine the extent to which an integrated high school program such as Linked Learning helped prepare a student for real-world challenges after leaving high school.

Weiss (1998) suggested survey researchers conduct a pilot questionnaire or interview to insure the respondents understand the questions. She recommended contacting people who are as similar to the target population as possible. The structured
survey and interview consisted of prewritten questions which helped insure validity and reliability (Weiss, 1998). The initial questionnaire was reviewed and edited by a district CTE operations manager. Current GUSD CTE students also reviewed the survey for comprehension and clarity.

The first section of the survey (Appendix C) contained eight questions regarding background information about the respondents. Data collected represented students’ responses to questions concerning outcomes after high school graduation. Respondents indicated whether they were currently pursuing an advanced degree or employed in a field related to their CTE course of study. The purpose of this portion of the survey was to develop a better understanding of potential connections between post-high school activities and an integrated CTE pathway or Linked Learning program of study.

The second section consisted of 10 questions directly relating to one of the three research questions. The first six questions related to former student perceptions of how the CTE curriculum impacted their engagement while in high school. Questions numbered 4 through 7 referred to social factors that influenced or supported students through their high school experience. The last four questions related to how their high school experience prepared them for post-high school life. Respondents answered each of the 10 questions using a Likert-based scale. The purpose of this part of the survey was to develop a better understanding of GUSD student graduate perceptions of the influence and impact that CTE programs had on their high school and post-high school experiences. At the end of the survey students had the option to volunteer to sign up to participate in a focus group in order to give of a detailed response that would add perspective to the survey answers aimed at improving future student achievement.
Because this study targeted students who experienced Linked Learning pathways and other programs that integrated CTE and core academic curriculum during high school, comparing data between CTE and non-CTE students was not be a primary concern; however, some data on attendance was included for reference.

The GUSD emailed the survey to approximately 1,400 high school graduates who had all completed a series of at least three CTE courses and graduated from the GUSD in 2014. After the survey was emailed out, 29 respondents went to and answered the survey questions within the first week. A group of current high school students who reviewed the survey earlier for comprehension suggested the survey email introduction and link be sent out on either a Sunday or a Wednesday to increase participation. The survey was sent out again 2 weeks later on a Sunday, and an additional 34 respondents went to the survey website and responded to the survey. There were, therefore, a total of 63 respondents to the survey.

In order to get a deeper understanding of the quantitative data collected from the survey, the researcher developed preliminary interview/focus questions that could have been modified based on the analysis of the survey responses. The researcher developed a set of open-ended questions considering the survey data collected (Clark & Creswell, 2010). These questions were reviewed and approved by the District CTE personnel. The researcher then identified, contacted, and scheduled eight respondents who volunteered to participate in a focus group. The focus group data helped provide perspective on other data from this study, as well as information that could help generate recommendations for later action (Krueger & Casey, 2009). The focus group provided effective insight and
was more useful because interviewees came from similar high school backgrounds, and
the focus group was conducted in a cooperative environment (Clark & Creswell, 2010).

**Data Analysis**

The survey was analyzed through use of descriptive statistics using measurements of central tendency. Qualitative data from interviews and focus groups were analyzed through a constant comparative approach in which data were recursively reviewed to confirm the themes (Clark & Creswell, 2010). Qualitative data were used to triangulate findings from the survey and was one strategy designed to increase reliability (Calfee & Sperling, 2010; Clark & Creswell, 2010; Merriam, 1998). The data gathered from former students and current staff were intended to help develop a broad perspective of the Linked Learning program and other district programs designed to integrate CTE and core academics. Data from this study were triangulated within the mixed methods structure in order to insure a more accurate summary of student outcomes and perceptions.

**Validity**

The researcher collaborated with district CTE staff to develop a survey that specifically related to the three research questions. The district operations manager was responsible for the content of the survey and has historically sent the survey out to former district students, compiling data received from the survey and sending the data to the required agencies. The researcher and operations manager for the district reviewed the questions asked in prior surveys and compared them with the researcher’s survey requirements. After securing permission, the researcher compared the survey questions to a similar survey conducted by Saunders (2013). Research questions were next reviewed by the dissertation committee and compared with surveys from past research. The
researcher presented the questions for a second time to the district operations director for final approval. It should be noted that the district’s program manager retired after the survey was initially created. Based on historical response percentages, at least 50%, or 1,000 respondents, were expected to respond to the survey questions.

Prior to sending the survey to the GUSD high school graduates, the researcher conducted a preliminary survey review to ascertain the clarity of the survey instrument and the length of time needed to complete the survey. The researcher administered the survey to 12 randomly selected current high school seniors enrolled in a district CTE program. The instructions were provided orally. No detailed explanation as to the survey’s purpose was given, other than stating that the researcher needed the student’s assistance to determine student perceptions of the district’s career and technical education programs. The students completed the survey in 10 to 15 minutes. After completing the survey, the students were asked to give their impressions of the overall clarity of the questions. Minor adjustments were made, although the test participants understood almost all aspects of the survey. Grand Union School District CTE personnel, including the operations manager, then reviewed and approved the final survey found in Appendix C.

At the end of the survey, respondents were asked whether they would be interested in being part of a focus group. Clark and Creswell (2010) stated that focus groups help stimulate open discourse amongst respondents who may otherwise be reluctant to respond to questions. The researcher contacted all eight respondents who indicated after completing the survey that they would like to participate in a subsequent focus group. The researcher conducted one focus group consisting of five participants.
Volunteer focus group participants were sequentially placed in a group based upon the order their responses were analyzed. The focus group occurred at a site that was mutually agreeable to the participants and the researcher.

**Limitations**

The researcher is a CTE teacher and, therefore, may have introduced some bias during the qualitative data-gathering and interpretation phases. This potential limitation was mitigated through the use of prescribed interview and focus group questions that left less opportunity for the insertion of any researcher bias.

The researcher was not able to verify the accuracy of student-reported quantitative survey data regarding attendance, grades, and other performance measures. Possible discrepancies between the actual and reported data may have been a limiting factor during the data collection process because the former student respondents will be self-reporting on the survey questionnaires.

The district’s CTE department sent out similar surveys during the past several years to satisfy Perkins Act requirements. The number of former district graduates participating in surveys from previous years was considerably higher. Lower participation in this survey could be attributed to the fact that a “Perkins” survey had been sent out a month earlier. The survey designed for this study was originally scheduled to be disseminated as part of the district’s Perkins survey. However, due to changes in CTE administration, the survey for this study was distributed by the district as a separate survey. In addition, current administrative staff reported considerably lower response rates for the district’s Perkins surveys this year as compared to previous years.
Respondents were more likely to respond to the survey if they perceived success after their high school experience; therefore, a volunteer bias may have negligibly contributed to a lower response rate (Clark & Creswell, 2010). These limitations suggest the necessity for district longitudinal collection capabilities for former student data. Expansion of the data collection process could render more accurate and reliable data that could positively affect student postsecondary preparedness.

**Ethics**

Since all student respondents were district graduates during the 2013-14 school year, it was reasonably safe to state that all study participants would be over the age of 18. However, to ensure each respondent was over 18 years of age, the first question on the survey asked the respondent to indicate if they were at least 18 years old. All respondents indicated they were over 18 for the survey. Nonetheless, survey data were anonymous so the participant’s age was not a factor. All focus group participants were also 18 years old. The school district emailed surveys to former high school seniors who remained anonymous and replied to the survey request on a completely voluntary basis. All respondents were fully informed about the procedures of the study prior to their participation and were advised they could have decided to discontinue their involvement at any time. No student names were reported during the course of the survey instrument, although students identified themselves once they volunteered for follow-on focus groups. All focus group and interview participants signed protocol documents (Appendices D and E) prior to the conduct of focus groups or interviews. However, no names were used in the writing of this dissertation, and the responses of all study participants remained anonymous and were treated with strict confidentiality.
CHAPTER 4—RESULTS

The purpose of this study was to determine student, administrator, and teacher perceptions of how core academic programs that are linked with work-based curriculum and real world experiences such as Linked Learning contributed to engagement in high school and readiness for postsecondary life. Analysis of the data was guided by these essential questions:

1. How do former students of Career Technical Education (CTE) pathway programs integrated with core academic classes or Linked Learning, perceive their engagement in high school?

2. What are these students’ perceptions of the impact their integrated CTE and core curriculum or Linked Learning program had on their high school graduation and postsecondary opportunities, both career and college?

3. What are administrators’ and teachers’ perceptions of the impact of integrated CTE program pathways such as Linked Learning on student engagement, graduation rates, and postsecondary opportunities, both career and college?

The questions focused the research on student perceptions on how CTE courses impacted their high school experience, as well as their employment or educational status after graduating from high school. Quantitative and qualitative methods were used to gather data for this study. A survey was sent out to recent high school graduates from the Grand Unified School District (GUSD; see Appendix C for the complete survey). The survey was followed by a series of three focus groups and two interviews with school administrators at two district sites. The researcher then interviewed the current and past district CTE Directors.
Findings

Participants

Respondents graduated from 15 different GUSD high schools; 5 were smaller with a theme, 1 was a continuation, and the remainder were comprehensive. The themed high schools included themes such as Construction Technology, Media Visual and Performing Arts, School of Business, and Digital Media Design. A significant percentage of respondents were from two high schools within the GUSD. Nineteen percent of the respondents graduated from Casa Grande High School (CGHS). Casa Grande High School is a comprehensive high school with an enrollment of approximately 2,600 students and offering six different CTE elective programs including Multi-media Design, Computer and Graphic Design, Broadcast Journalism, and Foods and Nutrition. Another 13% of the respondents graduated from Alexander Graham Bell High School (AGBHS). Alexander Graham Bell High School is a high school with an enrollment of approximately 2,300 students and offering CTE programs in Computerized Graphic Design, Engineering, Culinary Arts, Child Development, and Auto Body. Because a significant percentage of high school graduate respondents were from Alexander Graham Bell and Casa Grande high schools, the GUSD CTE staff helped facilitate the scheduling of staff focus groups and administrator interviews at both of those sites. The researcher conducted site interviews and focus groups in December 2014 and January 2015, discussing the questions from Appendices B and C, respectively, as well as presenting the participants with some data from the study’s email survey.

The high school graduate focus group had five participants, the teacher focus group from CGHS had nine teachers, and the teacher focus group from AGBHS had five
teachers present. The researcher then interviewed the principals from CGHS and AGBHS at their sites and conducted the final two interviews with the former and most recent GUSD CTE Program Director (Appendices A and F). Both interview and focus group questions (Appendix G) examined staff and administrator perceptions of the three essential research questions, as well as their perceptions of the data from the online survey.

Graduate’s Current Status Information

The study’s Student High School Survey (Appendix C) initial research survey questions consisted of eight questions to identify the respondent’s current employment and/or educational status. The respondent’s current status was an indication of the high school graduates’ readiness as they transitioned into postsecondary life. Additionally, respondents who graduated high school then went on to employment or further education related to their CTE program of study could be perceived to be more prepared for postsecondary life. The first eight questions contained every potential postsecondary outcome ranging from attending a 4-year college to not working or attending college or a university. The results of this part of the survey are displayed in Table 1.

Eight percent of the survey respondents reported they were employed in a job not related to their high school course of study, and 5% noted that they were currently furthering their education related to one of the CTE high school pathways in which they completed at least three courses. These statistics indicate that 22% of the respondents were continuing to work or train in an area directly related to their high school CTE program of study. However, 62% also reported that one of the reasons they pursued their CTE course of study was to train for a possible career. Respondents cited “training for a
possible career” more often than any other reason for selecting a CTE course of study during high school: more than any other social reason including the influences of family, friends, teachers or even their own personal interest. Therefore, 40% of the student respondents changed their career path choice at some point during high school or within 6 months after high school graduation.

Table 1

*Reported Status of Survey Respondents*

<table>
<thead>
<tr>
<th>Status</th>
<th>Percent response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Serving in the military</td>
<td>2</td>
</tr>
<tr>
<td>2. Attending a 2-year college</td>
<td>45</td>
</tr>
<tr>
<td>3. Attending a 4-year college</td>
<td>42</td>
</tr>
<tr>
<td>4. Currently furthering my education related to one of my CCTE high school courses</td>
<td>14</td>
</tr>
<tr>
<td>5. Currently furthering my education NOT related to one of my CCTE high school courses</td>
<td>9</td>
</tr>
<tr>
<td>6. Employment in a job related to your high school course of study</td>
<td>8</td>
</tr>
<tr>
<td>7. Employment in a job NOT related to your high school course of study</td>
<td>19</td>
</tr>
<tr>
<td>8. Not working or attending a college or university</td>
<td>0</td>
</tr>
</tbody>
</table>

Many high schools advertise that one of their primary goals is to have their students go on to college. Eighty-seven percent of the respondents to the survey indicated that they were currently attending a 2- or 4-year college. Therefore, if one of the main measures of a successful high school graduate were going on to higher education, a significant percentage of the respondents would be believed to be “successful” high school graduates.
Research Questions Summary and Analysis

To achieve its purpose, this study addressed three research questions encompassing high school graduate, teacher, and administrator perceptions of CTE program effects on student engagement, social factors that impacted their high school experience, and postsecondary readiness. Questions 1 and 2 benefitted from the triangulation of both qualitative and quantitative data, whereas data for question 3 relied solely upon qualitative data from interviews and focus groups with educators.

Research Question 1

*How do former students of CTE programs integrated with core academic classes, or Linked Learning, perceive their engagement in high school?*

The first three questions of the online survey supplied data to evaluate this research question. The research question was designed to determine student “engagement.” Furlong and Christenson (2008) determined a student’s degree of engagement could be indicated by the amount of time a student spends actually doing schoolwork, their attendance, active participation in classes, or the extent to which students perceive the relevance of school to future aspirations. Higher degrees of engagement in school should have a positive correlation with a student’s ability to graduate. Therefore, survey question 1 asked the recent high school graduate respondents if they believed their “ROP/CTE course of study helped (them) graduate from high school”; 88.9% of the respondents agreed with that statement, whereas 11.1% did not agree (Figure 1).
Survey question 2 measured student engagement through inquiring as to whether each respondent “enjoyed high school because of [their] ROP/CTE course of study”; 90.5% of the respondents agreed with this statement, whereas 9.5% did not agree (Figure 2).

**Figure 1.** CTE helped student graduate.

**Figure 2.** Enjoyed high school because of CTE.

When students love what they are learning, they work harder, dream bigger, and learn more (Rustique & Stam, 2013). Student engagement can be expected to increase when they enjoy a class or activity. One of the recent high school student graduates conveyed that point in the focus group by stating:
I took a lot of architecture classes, which is really like my passion, and being at my small [career-themed high] school it was like a family because we graduated maybe 60 seniors. So we were all really close, and there wasn’t really any bullying or anything, so it was good to go because everyone talked to everyone and it was real fun.

The third question from the online survey that dealt with student engagement asked if the respondent’s “ROP/CTE course of study motivated (them) to stay in school”; 82.5% of the respondents agreed with that statement, and 17.5% disagreed.

The GUSD graduates participating in the focus group did not directly attribute staying in school to any one particular class, although all but one of the group members mentioned that CTE classes were their favorites. The one participant who did not cite a CTE class as their favorite stated that he enjoyed more difficult classes such as Advanced Placement (AP) classes. On the other hand, 80% of the high school graduate focus group stated that they would have graduated without a CTE course, although all agreed that it would have been more difficult. One respondent emphatically stated, “I wouldn’t have graduated [without a CTE course of study]. There would be no chance. I wouldn’t have even gotten back into school.”

There are always social factors that keep students interested, motivated, or engaged in school. Friends, family, and other adults such as teachers are some of the most direct and immediate people to influence high school students. The initial part of the online survey asked high school graduates to reflect upon what first got them interested in their CTE program of study. Sixty-two percent of the respondents stated that they chose to pursue a CTE course of study to train for a new career. More than half of
those surveyed indicated that they did not enroll into their course of study for social reasons, such as friends or family. Therefore, a majority of students reported that they were very cognizant of their postsecondary life and are not merely interested in courses their friends take, families approve of, or are being taught by a particular teacher.

During the high school graduate focus group, one of the participants who graduated in an architectural program of study and was working toward a college degree in architecture noted that his favorite classes were his CTE classes. He stated that although his instructor “just barely got his teaching degree . . . he was actually in the field so we were learning firsthand knowledge.”

Question 4 from the online survey asked students to consider the social influences of friends on reasons why they chose a CTE course of study. The question asked them to choose the degree to which they agreed or disagreed with the statement that “I took a CTE/ROP course of study because my friends were enrolling in the same program.” The results (Figure 3) showed that 46% of the respondents agreed, while a majority of 54% did not agree with the statement.

![Figure 3. Influences of friends on CTE choice to study.](image-url)
Once the student enrolled in the CTE program of study, they received support from various sources to graduate in 2014. The GUSD high school graduate respondents first noted their degree of agreement/disagreement with survey question five, “My teachers supported me during my ROP/CTE course of study”; 96.8% of the survey respondents agreed with the statement, whereas 3.2% disagreed (Figure 4). A 2014 GUSD high school graduate focus group participant responded that, “It was good to have that support from a teacher that really cares about your life . . . and makes people feel good about going to school.” A different student stated that she received support from teachers and counselors, but “not all of them, just the ones I had gotten really close to for the most part.” These teachers were not specifically identified as CTE pathway instructors. Yet, another female graduate from a continuation high school pointed out that she received “really great support, especially at a smaller school. More teachers tend to care about more students than maybe just one connecting with a couple students.”

Figure 4. Teacher support during CTE course of study.

The high school graduate focus group members agreed that students react positively to having a choice. One male respondent commented that he remembered
students in school: “I think that if it’s a CTE [class], an elective kind of thing where you can choose to go in and just learn, like a knowledge based thing—word will get around that it’s a great class and really helps.”

Survey question 6 sought to determine another type of support asking to what degree GUSD graduate respondents agreed that their “family supported (them) during (their) ROP/CTE course of study”; 84.1% of those surveyed agreed their family did support their CTE course of study, and 15.9% did not agree (Figure 5).

![Figure 5. Family support during CTE course of study.](image)

Former student focus group participants did not cite family members as support providers, but rather identified their family members as motivators and a source of inspiration. Focus group members mentioned that parents provided guidance and they found inspiration and motivation from family members who were younger than themselves. Two of the female participants noted that they wanted to set a good example for their younger family members.
Research Question 2

What are these students’ perceptions of the impact their integrated CTE and core curriculum or Linked Learning program had on their high school graduation and postsecondary opportunities, both career and college?

The first portion of the student online survey asked the GUSD 2014 graduates about their current postsecondary life status (Table 1). Eighty-seven percent of the respondents indicated that they were attending either a 2- or a 4-year college. Of those respondents, 14% stated that they were furthering their education in an area related to the CTE courses they took in high school. Eight percent of the survey respondents indicated they were employed in a job related to their high school CTE pathway, and 19% were employed in a job not related to their CTE courses.

The final four questions of the survey focused on high school graduate perceptions of how well their high school experience had prepared them for postsecondary opportunities. Survey question 7 asked whether the respondents agreed that their “ROP/CTE course of study helped (them) understand concepts in other academic classes such as math and English”; 79.4% of the respondents agreed with that statement, whereas 20.6% did not (Figure 6).

One student respondent who graduated from a high school with a business management-themed career academy commented that, “The Academy of Business truly helped me through school. I’m now eager for the future and working hard for a degree in college. I now feel more prepared to find a career after college.” Another student from the focus group stated that, “Those [CTE] were great classes. The ones that actually helped you do things later on in life.”
The eighth question from the online survey directly asked the respondents to agree/disagree with the statement that, “My ROP/CTE course of study prepared me for work after high school”; 76.2% of the respondents agreed with the statement, and 23.8% disagreed (Figure 7). It was also important to note that 27% of the survey respondents stated that they were employed. Therefore, 73% of the respondents could only predict how prepared they would be for work after high school.

Question 9 of the survey asked the respondents to record their level of agreement with the following statement: “My ROP/CTE course of study prepared me for classes
after high school.” With 87% of the respondents indicating that they were either at a 2- or a 4-year college, one would deduce that the respondents would have some experience to draw upon to increase the validity of their response; 82.5% of the survey respondents agreed with this statement, and 17.5% were at some level of disagreement (Figure 8).

![Figure 8. CTE prepared me for classes after high school.](image)

The final question of the GUSD graduate survey, question 10, was an all-encompassing question regarding postsecondary student preparation. The question asked the respondent’s degree of agreement to the statement, “Because of my ROP/CTE course of study, I feel better prepared for life after high school compared to other people my own age”; 79.4% of the respondents agreed with the statement, whereas 20.6% did not (Figure 9).

One of the high school graduate focus group participants stated that a core class helped them prepare for postsecondary life, but all of the participants talked about how their twenty-first century skills had improved. They identified skills such as meeting deadlines, time management, speaking, giving presentation, and life management skills in general as those they learned in high school that had been particularly helpful after high
school. Sixty percent of the focus group students cited speaking skills as a helpful skill they learned in high school (Figure 9). All focus group participants indicated that they are pursuing some sort of postsecondary education, but many of the skills and abilities identified are applicable to the work place as well as the classroom. Sixty percent of the participants also stated that they were pursuing a career directly related to their high school CTE program of study, so some of the more career-oriented skills they learned in high school would transfer to future jobs.

![Figure 9](image)

*Figure 9.* Feel better prepared than other people my own age.

The recent GUSD high school graduates then added some general thoughts that came to mind during the focus group. One respondent commented:

Everyone thinks that high school is preparing you for it [life after high school] but it’s really not. . . . If there was a class that could prepare you more, prepare you effectively, maybe hands on stuff, then that would be nice. CTE classes really helped.
The focus group participants then identified some other skills they thought were helpful, like filling out the W-9, interviewing, how to keep your job, and deal with your boss. The general and recurring theme throughout the focus group was that the respondents valued skills that could be applied. One participant stated, “Like, every day right now, I’m not using math. Math works and is useful like problem solving but other than that I’ve never [used it].”

Research Question 3

*What are administrators’ and teachers’ perceptions of the impact of integrated CTE programs such as Linked Learning on student engagement, graduation rates, and postsecondary opportunities, both career and college?*

**Engagement and social factors.** The principal from Casa Grande High School (CGHS) believed that it would not be difficult to mistake compliance with engagement. He stated, “We have great kids, so if you go tell a kid to go do this, that kid’s going to go do that, but that doesn’t mean that kid’s engaged and learning.” The CGHS principal went on to suggest that perhaps the student’s actions might suggest, “that kid is well-raised and [merely] did what you told them to do,” but really did not engage in learning.

The educators from both Casa Grande and Alexander Graham Bell high schools had mostly positive perspectives of the impact of CTE programs at their schools. The teachers at CGHS identified instances where they collaborated with other CTE teachers. For example, a student in an engineering class coordinated their actions with a teacher in a graphics design class and constructed a banner for an upcoming engineer competition. The principal from CGHS agreed with a collaborative approach and went further by
stating, “What we need to do a better job with is linking together the core subjects with the CTE courses.” He continued his thoughts stating the importance of “showing the relevance between screen printing and a math course [as an example] or screen printing and an English course. If they [the two linked courses] are interwoven, they’ll be stronger than if they’re just two separate entities working together.”

A teacher from the AGBHS staff focus group commented:

Students who may not be engaged academically in their other classes will become interested in school and really participate in classes that they are active in, such as food preparation or culinary arts or auto body where they’re hands on.

A GUSD CTE Administrator supported this perspective of linking courses together when he stated:

It was about that journey and that discussion of first understanding learning has a relevant place in each classroom, and that what you learn in one classroom is carried over to another classroom, although we often don’t see the connectivity as a student.

A different CTE district administrator observed that, “I am seeing classes that are being linked together on a number of our campuses where the teachers have shared preps, they work together on common projects, and that’s what we believe we need to do more of going into school year 2015-16.”

Another participant from the AGBHS staff focus group stated:

The reality of my English class is I have 36 students in each class five times a day, and I have to hammer curriculum, common core, rigor, rigor, rigor and then the bell rings, and they’re on their way where in say a cooking class there’s a
community project going on. They’re working on something together and they’re laughing and it’s enjoyable, and then you have a wonderful treat that you have at the end. The only treat my students get is the fact that the bell rings, and they get to leave. I mean, come on, it’s English.

One of the teachers from CGHS stated that he had taught English for most of my career and it’s only the last few years where I’ve been all CTE. I notice there is a huge difference between student engagement in the classes . . . they just seemed to be way more motivated to do the sort of hands on work we do [in CTE].

A different teacher from the same focus group taught both a core science class, Biology, and a CTE course, Biotechnology. She commented that not only was the CTE student’s engagement different, but so was “their motivation and sometimes attendance.” Another CGHS teacher believed that “the more hands on, the better.” She felt her “kids [were] always engaged and they [felt] sad when they [were] going to miss the lab or miss cooking.” The CTE Department Chairperson at CGHS noted that some of his students skip out on other classes, stating that “the attendance office gives us little slips saying you marked so-and-so here, they were marked absent in every other period.”

Other teachers from the department stated that scenario occurs in their classroom, as well. Teachers agreed that elective CTE courses that students “choice into” could motivate them to do the work necessary to remain in school. A teacher from AGBHS stated while in her focus group, “I don’t think kids are coming to school to take social studies and math and English, [but rather] something they choose on their own. I think [CTE] gives them an option to learn a different area of life.” The principal from AGBHS
supported the teacher observations by pointing out, “So whatever is of interest to kids, kids will find a way to stay in school if you offer something other than the traditional courses and classes to be successful.”

Teachers commented that their relationships with their students were different than in other classrooms around the school. Casa Grande High School teachers stated that students come in to CTE classrooms frequently requesting help in other core classes, such as English. Another CGHS CTE teacher remarked, “I think the students feel we’re more on their level sometimes and so I get a lot of, ‘I don’t understand what he’s trying to tell me,’ or ‘this is the assignment, can you explain what he wants?’” His colleague added, “I think [CTE teachers] are more in touch with what’s happening today out there in the workforce and the career pathway.” One other teacher who taught both a CTE and an English class stated:

There’s a completely different type of connection relationship, but I can remember the difference between just the vibe that I had in my English class—it’s almost a similar relationship that a coach and a player have. It’s different, a little bit tighter.

The principal from CGHS noticed, “I definitely think CTE hits a niche of students that may either slip through the cracks or in the middle, and they keep them together.” However, neither principal saw any difference in the number of behavior issues, such as referrals or suspensions, between CTE and non-CTE students.

Many teachers commented in their focus groups that they observed greater support and response coming from CTE, as opposed to core academic teachers. A teacher from AGBHS stated, “I have had children say that some of their academic teachers don’t know
their names. I think we [CTE teachers] get to know them a lot better, but it does depend on who the teacher is.” A teacher from the same focus group noted that, “some of these students are very needy. They need support and unless they come in after school they’re not going to get it.”

The current GUSD CTE Director stated that, in order to increase student engagement, it is important to provide CTE instructors with “standard high school teacher credentialed preparation models” that will give them more classroom and pedagogical skills. He went on to report that in district high schools that do not follow a Linked Learning model, “The teachers never have a chance to sit down together. And we’re hoping they can do it at lunch or maybe they can meet after school, and those opportunities are just not going to get the job done.” The director then suggested that a block schedule would provide more opportunities to create common prep periods for teachers.

His predecessor suggested that another way to increase student engagement could be to facilitate high school curriculum collaboration and alignment not only with higher educational institutions, such as universities and community colleges, but also with elementary and middle schools. He stated the need to “get the universities at the table and really take a look at the pre-K through grade 16 concept.”

**Readiness.** A district CTE Administrator looked through a broad-lensed perspective commenting that it is important to understand:

Engaging in any specialized program of study whether it be ROP or athletics or music, [it] is about developing all of the higher order thinking skills, all of the
scan skills, all of the P-21 [Partnership for 21st Century] skills that support students’ success.

Both teacher focus groups and principal interviews were replete with stories of former CTE students who graduated high school and went directly into employment or postsecondary training and education in the same field as their CTE class series. One teacher from AGBHS told of a CTE auto shop student who secured a job at a major collision center just after high school graduation. Another AGBHS teacher cited a student who applied what he learned in CTE culinary classes to gain employment at a fine dining restaurant while attending a prestigious culinary school.

Some students who are graduating pathways are better prepared for advanced university student responsibilities because of their pathway experiences in high school. A teacher from CGHS stated:

Routinely a lot of my students will go into college and apply for—even in their freshman year—to be lab technicians and so on at the colleges. And usually juniors and seniors at the colleges have a hard time getting those because they don’t have any experience.

The principal from AGBHS also recognized that graduates from his high school have options that may not be available to other students. He stated that once students progress through a particular pathway, they “are still eligible to go to college but then [they] have a choice. And because in most cases—there are jobs they can get into at the entry level while they’re simultaneously going to school.”

Teachers also knew of former CTE students who went on to a university, although the student “really had not even imagined that he would be able to go to a 4-year college”
until he was exposed to opportunities through the CTE class. The initial high school
graduate success stories that the teachers and administrators discussed were most
commonly from integrated CTE program graduates who went on to jobs, training, or
postgraduate schools that pertained directly to the high school CTE course of study.

The administrators and teachers who were interviewed also discussed former
students who went on to 4-year colleges, but talk of former students who continued their
education or careers in the teacher’s specialty was more abundant and detailed. However,
some teachers mentioned how pathway courses helped former students at the university
level. A teacher from CGHS talked about one of her former students who saw “the
application [of pathways classes] to other classes on campus.” She went on to state, “A
lot of my students are like, ‘Wow, chemistry is so much easier now that I’ve done that,’
or even their math and so on.”

Another teacher at CGHS talked about other classes that have benefitted high
school student graduates once they get in to college. He illustrated his perspective
through a story about his son:

My son’s a senior at San Diego State, a mechanical engineering student. He was
involved in First Robotics with me [at CGHS] when I had taught my engineering
clubs, and we’d do these different projects. He was telling me he still hasn’t
gotten to a point in his [college] classes where he’s doing the things we’d been
doing in the [high school] club. So actually controlling motors via software,
programming a sensor. And I went to San Diego State and I feel the same. I
didn’t do anything that was hands on and real until I was a senior, my senior
project. It’s amazing to teach these classes in high school. We get that all the time, engineering in high school? What?

Teachers told other stories of former students who were in other engineering classes or computerized graphic design who went on to start businesses in screen printing, or another student who “was on the news earlier this year” for doing “the design for the Louisiana Chicken and Waffles, and they actually featured the restaurant earlier this year on the morning news” after she graduated from a high school pathway program.

A district CTE administrator commented that he did not believe that the GUSD CTE system was preparing all students adequately, but that the current system is set up “to serve students that are the most in need.” He continued his thoughts stating:

While research studies are very conclusive about partnership academy approaches, integrated academic approaches, in terms of what it does for curriculum and instruction, as well the personalized learning environment for each student, is always focused on [students that are most in need]. This is what we do when things are not going well when students have a certain level of need. Integrated academics are great for students across the board.

Other Data Collected

When 59% of first-time, full-time students seeking a bachelor’s degree actually complete that degree within 6 years, 41% of those students leave college early (NCES, 2014). In 2014, just within the University of California (UC) system of nine universities, there were over 160,000 freshmen enrolled (California Colleges, 2015). Therefore, only considering the UC system, 65,600 students will not complete college nor receive a bachelor’s degree. It is conceivable that a percentage of those 65,600 citizens could have
finished college if they had increased their understanding of abstract concepts while in high school.

Attendance data from GUSD comparing CTE students to non-CTE students provides insight into the engagement of each group of students. The researcher asked both AGBHS and CGHS for data that could differentiate between each of those groups. Neither high school administrator had access to or was aware of these types of data. However, GUSD personnel were able to provide attendance data that differentiated between students who enrolled in a CTE program of study and those who were not enrolled.

The Senior Systems Analyst at GUSD compared rates of attendance between the approximate 1,400 students who received the email link to the survey and the remainder of high school graduates that year from the district. The rate of attendance for all district CTE participants during the 2013-14 school year who received the email survey was 88.49%, whereas the attendance rate for all non-CTE participants was 93.67%. The analyst considered all high schools within the district that offered CTE courses.

The GUSD analyst also provided data on graduation rates. In 2011, 4,607 freshmen enrolled in a CTE class within the district, while 7,850 other freshmen enrolled in classes other than CTE. In 2014, 2,590, or 56.2% of the students who had enrolled in CTE courses back in 2011, graduated from a GUSD high school, while 4,065 or 51.8% of the students not enrolled in CTE as freshmen graduated. Some of the students who enrolled in CTE as freshmen and did not graduate may have transferred to other schools or graduated from a GUSD school at a later date. Additionally, it is possible that some of
the students who did not enroll in CTE as freshmen enrolled in a CTE program of instruction after their freshmen year.

**Summary**

A teacher from AGBHS stated that not every child needs to attend a university to be successful and that “the parents are possibly aware of this too and they’re in full support of another path of study that will suit the needs of their child.” Data collected indicate that CTE courses are a critical component of the high school course offerings. Both student and educator respondents seemed to agree that having course options for students and allowing them to take classes they are interested in helps students engage and remain engaged in their classes. The two principals interviewed in this study indicated that they are constantly looking to introduce improved and more popular choices for their students. A significant majority (between 82-90%) of high school graduate respondents indicated that the CTE pathways they took in high school helped them enjoy high school more, motivate them to remain in school, and ultimately graduate from high school.

The survey also revealed that 62% of the respondents stated that they chose their particular CTE program of study or course of study because they were interested in pursuing a career. According to respondents, other social influences such as parents and family had a more limited impact on a student’s decision to pursue a specific pathway, although younger siblings were motivating factors in some instances.

Significantly, 96% of the survey respondents agreed that their high school teachers supported them during ROP/CTE classes. The fact that teachers reported that they valued building close relationships with students may have indirectly contributed to
that finding. Recent high school graduates also reported that they valued skills, such as organization, presentation, and public speaking skills, noting the universal utility of such skills. Career Technical Education instructors commented that students are engaged when learning hands on skills that can be directly applicable to the “real world.” It was suggested that this approach could also explain why former students and teachers reported stronger connections between students and their CTE teachers. In fact some CTE teachers who had, at a different time during their career, taught a core academic subject, reported closer bonds with their students.

While strengthening relationships between CTE teachers and students may have contributed to student engagement, 79.4% of those high school graduates surveyed indicated that their ROP/CTE course of study helped them understand other academic subjects, as well. That increased comprehension may have also assisted the transition of those students into college as 82.5% reported that they were better prepared for classes after high school.

Of those surveyed, 60% reported that they were pursuing a career directly related to their CTE course work, although 8% indicated they were employed in a line of work related to the same high school CTE pathway. However, since 87% of the respondents indicated they were attending a 2- or 4-year college, it is possible that some of those students may be employed while attending college. Part time jobs may not always be aligned with a career path.

The research indicated that students generally perceived that they were better prepared for postsecondary life because of their CTE course of study. Many teacher and administrator focus group participants supported that finding by providing many
examples of former students who, after receiving their high school diploma, informed their past CTE teachers that they were having success in the work and/or the college environment. Although it would be less likely for a returning student to self-report negative personal information, teachers and/or administrators did not provide any anecdotes of failure.

Finally, district CTE administrators seemed to agree that student engagement and readiness would benefit from more of an integrated academic and project based learning approach at the high schools. They also supported the perspective that it was important to allocate time and resources to teacher training and to encourage career and college collaboration for programs of study from pre-Kindergarten all the way through college.
CHAPTER 5—DISCUSSION AND INTERPRETATION

This chapter analyzes and discusses the study findings and provides recommendations for further research. Conclusions were analyzed in the context of past research in order to more completely understand the perspective of high school students and educators regarding how well CTE programs of study ultimately prepare students for post-high school life in the 21st century.

Restatement of the Problem and Purpose

High school dropout rates remain at approximately 30% in the United States, while high school graduation rates of other developed countries surpass 90% (Swanson, 2009). Those revealing statistics become more disturbing in the context of a global society where it is progressively more important for high schools to provide American workers with the skills and abilities necessary to contribute and compete with potential foreign employees (Wachen et al., 2011).

The American high school graduates who make it to college are faced with more challenges. The National Center for Educational Statistics (NCES, 2014) reported that 59% of first-time, full-time students seeking a bachelor’s degree actually complete that degree within 6 years. Therefore, one might question whether high school students are adequately prepared for collegiate academic challenges. It is imperative to increase high school graduation rates through effective student engagement strategies and, while students attend classes, provide instruction that will give them the skills and abilities necessary to succeed in college and/or career.

Notwithstanding the potential of CTE programs of study to increase college readiness, high schools often place emphasis on preparing students for college. Too
many high schools focus on the number of their graduates who have been accepted to college, the amount of prestige those colleges possess and the amount of academic scholarships their graduates received. The majority of time and attention at high school awards presentations is too often directed at students receiving academic accolades and scholarships to major universities. When schools focus on increasing the number of advanced placement and college preparation classes offered, other students who may possess skills in areas other than academics are too often not recognized. Celebrating a high school student who is graduating into a respectable job, an apprenticeship, or a reputable trade school could communicate a message to all stakeholders.

During the study’s interviews and focus groups, teachers and principals noted how CTE programs of study contributed to engagement and helped prepare students for postsecondary life. However, some of the same individuals also demonstrated a prevailing attitude that did not promote, request, nor demand a deeper integration of CTE with core academic classes. One of the district’s CTE department directors commented that Grand Union School District (GUSD) is not doing enough to fully integrate CTE and core academic courses. He stated, “So even as we look and we say improving integrated academics in the age of common core, it would be most useful to start by having a platform by which all academics have gotten to an integrated state.” The students mentioned how their high school CTE program of study helped them prepare for higher education, but if educators do not realize the potential of an integrated education, collaboration across CTE elective and core academic classes will likely fail to realize its potential.
This study’s purpose was to determine student and educator perceptions of how core academic programs that are linked with work-based curriculum and real world experiences found in programs of study such as Linked Learning contributed to engagement in high school and readiness for postsecondary life. The following research questions guided this study:

1. How do former students of CTE programs integrated with core academic classes, or Linked Learning, perceive their engagement in high school?
2. What are these students’ perceptions of the impact their integrated CTE and core curriculum or Linked Learning program had on their high school graduation and postsecondary opportunities, both career and college?
3. What are administrators’ and teachers’ perceptions of the impact of integrated CTE programs such as Linked Learning on student engagement, graduation rates, and postsecondary opportunities, both career and college?

The following discussion outlines the major findings to questions regarding students’, teachers’, and administrators’ perceptions of CTE pathway programs relative to student engagement, postsecondary opportunities, and curriculum design associated with the integration of CTE and core academics. Based on the analysis and triangulation of data from the survey, interviews, and focus groups, three significant areas are presented as a framework for examining the data within the context of other scholarly literature pertaining to CTE pathways.
Factors Motivating Student Enrollment in CTE Pathway Programs

Influencers

This study considered engagement through a student’s sense of connection to the school as reflected by the amount of time each student spends on school work, their active involvement in learning, attendance, and to the extent they perceive the relevance of school to their future (Furlong & Christenson, 2008; Newmann, 1992). Engagement could also be shaped by social and cultural influences (McInerney, 2012), so the study also considered the amount of influence and support others had on the students’ decision to enroll in and continue with their chosen CTE program of study.

Grand Union School District (GUSD) attendance data during the 2013-14 school year did not provide conclusive evidence to support data from the research in this report. Teachers from AGBHS and CGHS generally believed student attendance in their CTE classes was better than other classes. Yet, GUSD attendance data for non-CTE students was marginally higher when compared to CTE students during the same school year. Grand Union School District also reported that CTE students’ graduation rates were slightly higher than non-CTE students when students were tracked from freshman year to graduation. Grand Union School District compared data between the students who received the email survey against other GUSD students who graduated that same year. Both the GUSD attendance and graduation data had the potential for a wide degree of disparity and are not as useful as they could have been with more precise data on students who initiate and complete a series of integrated CTE classes through all 4 years of high school.
This study also looked at motivation and support as a contributing factor to student engagement. When Gaunt (2005) researched the influence the various people had on student decisions to enroll in a CTE program of study (POS), he did not include other reasons, other than people, that could influence a student’s enrollment decisions. However, Gaunt found that in regards to other people’s influence on enrollment decisions, friends and family (specifically the mother and father) were the two most common factors effecting a student’s decision to enroll in CTE. These data aligned with a finding in this study, supporting Gaunt’s finding that, of the people who influenced a student’s decision to enroll in a CTE POS, friends were the most influential. The respondents in this study, however, indicated that friends (27%) were the second most common reason why they chose a CTE course of study, and teachers (24%) were the third most common reason. However, 62% of the high school graduates surveyed indicated that the most common reason why they chose a particular CTE POS was because they wanted to train for a possible career.

For a broader scheme of comparison, 54% of the survey respondents in this study did not agree with the statement that they “took a CTE/ROP course of study because my friends were enrolling in the same program.” When considering both of these data, the influence that friends have on the decision making processes of students is undeniable, but not the most influential. Breaking down these data even further revealed that only 24% of survey participants either strongly agreed or agreed with that statement, whereas 41% either strongly disagreed or disagreed with the statement (Figure 4).

Students who might need more academic and social support are not as engaged and do not always perform as well in traditional school settings (Saunders & Chrisman,
Also Ream and Rumberger (2008) found that developing relationships can increase engagement, evidenced by decreased dropout rates. These findings agree with data from this research paper’s study where survey respondents reported they had received positive support from their teachers and family. Regarding teacher support, 96.8% of the respondents agreed that they felt supported by their teachers in their CTE/ROP class. Additionally, out of a total 84.1% in agreement, 68% either strongly agreed or agreed that their families supported them in their CTE/ROP class.

**Career Training**

Although various people influence a student’s decision to pursue a CTE POS, this research study found that influencers were not the primary reason why students chose a particular course of study. Considering that 62% of the respondents stated that they enrolled in a CTE/ROP course of study in order to train for a job leads to the belief that the respondents were more likely to enroll in a CTE/ROP class, because of the training and education they would receive as opposed to the social influences of friends or family. As survey respondents reflected on their high school class choices, a good majority were more concerned with their personal career path as opposed to any social approval or disapproval they may have received from friends or family. This finding suggests that high school students were engaged in career path decisions and selection while in and even before high school.

**Postsecondary Pathways to College and Career**

Because all respondents reported they were either attending college or employed, the data of this study would support that students are graduating from a CTE POS and initially entering postsecondary life successfully. The majority (87%) of GUSD graduate
respondents reported they were attending a 2- or 4-year college. A significantly smaller percentage (8%) of the respondents stated that they were employed in a job related to their high school CTE course of study, while 19% indicated they were employed in a job not related to their CTE high school POS. These statistics disturbed one GUSD CTE administrator who would have liked to have seen a higher percentage of students employed after high school in a field related to their CTE course of study.

The data from this study aligned with Saunders’ (2013) findings which indicated that Linked Learning alumni were more likely to attend either community college or a 4-year institution. Qualitative data from Saunders supported this claim, as her interview participants also reported that an integrated CTE POS helped prepare them for college and career.

A teacher from AGBHS gave an example of some low income families not having the same opportunities to provide artistic or creative outlets for their children. She talked about families with better economic circumstances providing music lessons, including students in youth sport teams, and giving them other opportunities. Elective classes in CTE can provide some differentiated opportunities, as well. Hearst-Blowe and Price (2012) found that integrated CTE students had a higher mean passing rate than non-CTE integrated students in math and English. Integrated CTE students also had a higher graduation rate, as compared to non-CTE students in the same study. Although the effects that an integrated CTE program of study may have of a site’s graduation rate are mixed, data from this and other studies reviewed in Chapter 2 indicated that an integrated CTE POS holds potential for increased comprehension of math and English.
Although not discussed as a primary consideration in previous studies reviewed in this dissertation, there appeared to be a lack of complete data from more affluent high schools regarding the efficacy of integrated CTE POS. The ability of integrated CTE POS students to understand and comprehend more abstract concepts found within subjects, such as mathematics, may have a positive effect on retention and graduation rates.

Teachers from the CGHS focus group were positive about the preparedness of students who graduated from their high school. The group cited multiple examples of former students who went on to college and were ahead of their peers or were gainfully employed, because of the skills they learned while in high school. These individual teachers also mentioned that they would help their students with other subjects, such as English, but did not discuss any collaboration or interaction with English teachers while mentoring these students. The structure of such channels of communication and collaboration could be facilitated through more integrated cross-departmental Professional Learning Communities (PLCs) at the site level.

Postsecondary life also requires universally applicable skills in almost all college and career post-high school options. All participants in the GUSD graduate focus group stated the CTE curriculum improved twenty-first century skills, such as public speaking, presentations, personal responsibility, meeting timelines, organization, and social skills. It is possible that some well-paying future jobs will only require limited training as supplied by certain CTE classes. A teacher from AGBHS described an auto-shop student graduate who was able to successfully find employment after high school based solely on the credentials and training he secured in high school. As stated in Chapter 2, however,
this will be more the exception than the rule into the future as at least some sort of postsecondary training will be required in most of the emerging industry sector jobs in the next 10 years (EDD, 2014).

**Career Technical Education Pathways Curriculum Design**

The principal from CGHS stated, “So if you ask me what the one thing our site is looking at and working on right now, I’m going to tell you it’s student engagement.” He observed a district that provided more resources to math, English, science, and history teachers for Professional Development (PD), leaving world language, special education, CTE, and other electives without the same PD opportunities. Although Saunders (2013) reported that the seed for collaboration between teachers across subject areas normally begins informally, school-sanctioned intervention and support was necessary to sustain an integrated POS. The current level of support within GUSD may not be meaningful or significant enough to justify some schools adopting an integrated CTE structure or approach.

**Integration With Core Academics**

The history of education in the United States formed a general perception of CTE as more of a viable option for certain minority races and ethnicities, as well as lower socioeconomic students. This common stereotype likely contributed to the stifling of some district CTE integration initiatives. The practices of separating students into college/academic and career/technical have carried a racial, social, and ethnic bias from their beginnings in the early twentieth century (Grubb, 2008). As a result, students categorized on the noncollege bound track often participated in the more hands-on courses found in a CTE program of study (Saunders & Chrisman, 2008). By segregating
different types of learners, the potential synergistic effects of collaboration between various learning types are not allowed to develop. Such biases can disrupt or completely derail efforts to increase horizontal or vertical planning or collaboration.

As discussed in Chapter 2, some educators, policymakers, and researchers proposed that integrating CTE with core academic classes will help schools increase engagement while decreasing dropout rates, especially for students needing additional support (Grubb, 2008; Richmond, 2010). The data collected in this study’s research agree with that finding. The principal from CGHS noticed that he “definitely [thought] CTE hits a niche of students that may either slip through the cracks or in the middle, and they keep them together.”

Grand Union School District attendance statistics, however, do not support findings from this study that integrated CTE pathway students attended classes more often than other non-CTE students. The rate of attendance for all district CTE participants during the 2013-14 school year was 88.49%, whereas the attendance rate for all non-CTE participants was 93.67%. If attendance is an indication of engagement, the GUSD attendance statistics do not support the claim that integrated CTE students were more engaged than non-CTE students. However, a CGHS staff focus group participant indicated that students were missing non-CTE courses, but consistently attended the CTE course. District attendance statistics did not differentiate which classes students were missing, so it is possible that CTE student attendance rates at non-CTE classes were lower than attendance rates at CTE classes. It may, on the other hand, be reasonable to infer that integrating CTE with other academic classes, such as English and math, could
increase engagement of students in all classes, hence increasing attendance rates across the board.

Studies conducted within the past 10 years have come to various conclusions regarding the effectiveness of an integrated approach on graduation rates (Bozick & Dalton, 2012; Castellano et al., 2007; Plank et al., 2005), although a growing body of evidence suggests that integrating CTE with academics has a positive effect on graduation while reducing dropout rates (Bozick & Dalton, 2012; Hubbard, 2012; Stone & Lewis, 2012). Schools with integrated CTE programs had higher graduation rates than schools from surrounding districts that did not operate integrated programs (LaFors & McGlawn, 2013). The GUSD does not track student attendance or graduation data by groups, such as those students in a CTE pathway program of study and those who are not. Longitudinal data on pathway enrollment, attendance, and graduation data would lead to a greater understanding of the effectiveness of pathway programs found in Linked Learning.

When each respondent in this research study determined whether a CTE/ROP curriculum helped them understand concepts in other academic classes, 79.4% indicated it did (Figure 7). Increased understanding could lead to better academic class performance and higher graduation rates. These findings align with more recent research which found that an integrated approach can increase student understanding and comprehension of other subject areas, such as math or English (Hearst-Blowe & Price, 2012; Saunders & Chrisman, 2008).

Despite these findings, high schools may display reluctance to take the time, energy, and resources to develop more integrated approaches found in Linked Learning.
pathways. Once schools or districts make the decision to adopt integrated programs of study, research identified the importance of support agencies to assist in the transition. Mentorship can significantly help site administrators build leadership capacity to develop integrated programs (Hubbard, 2012).

Insuring that GUSD high school teachers are allowed the opportunity and encouraged to vertically plan with feeder middle and elementary school, teachers could assist in that effort. High school educators interviewed in the context of this survey were not asked specifically about this facet of their planning processes. Therefore, it is possible that some vertical curriculum planning may already have been occurring. This type of activity must be encouraged and possibly expanded.

Implementing programs such as Linked Learning that integrate CTE courses with core academics could demand considerable time and energy. For example, preparing staff and curriculum to support the integration of a computer engineering class and a math class could present a major change for some high schools. The process would require initial and sustained collaboration across unfamiliar departments. Staff members would likely progress through orientation and training classes to begin initial planning phases. A high school could have to plan for and incorporate sweeping structural changes in order to facilitate the incorporation of an integrated program such as Linked Learning. The new structure would need to facilitate horizontal and vertical collaboration both within and external to the site. The master schedule would need to accommodate and align with structural modifications. Changes such as these could be deemed as too disruptive or intrusive by some educators who may question the value or overall worth of the potential gain. Confronted with the specter of uncomfortable change with an uncertain future, a
district or site may opt to choose a safer way to invest its energy and resources. Data from this research identify potential upside in the context of a global society that changes exponentially and at an ever-increasing rate.

Once the site or district commits to an integrated CTE philosophy, focus must shift to how the newly adopted strategy affects student performance and outcomes and how it can best be sustained. Saunders (2013) noted though that once initial cross-curricular collaboration begins and integrated projects develop, teachers and principals agreed that support would be necessary to sustain the initiative. She continues to add that in order to reach its potential, curriculum development needs to extend beyond the classroom in order to be relevant to the students. If site or district personnel are not fully committed to an integrated CTE POS from the onset, the likelihood of improving student engagement and positively affecting retention and graduation rates will be diminished.

**Constructivism**

Symonds (2011) stated that “there is a perceived disconnect between the classroom and the ‘real world’” (p. 21). Programs that apply classroom learning to a tangible life experience effectively engage students, increasing skill development, degree attainment, and eventually postsecondary job success (Stone et al., 2006; Symonds, 2011). Disconnected learning disengages students and undermines comprehension (Grubb, 2008).

Data from the survey support that students are more engaged when they are learning “real world” skills from a relevant curriculum that will apply to their postsecondary lives. The principal from AGBHS echoed these sentiments, commenting that students do not always understand the applicability of the Pythagorean Theorem:
“They don’t make that connection. But developing a computer engineering model of a house, they get that. They live in one.”

The principal from CGHS commented that “we put our woodshop teacher with our theater teacher,” but he went on to say that the school is still searching to “show the relevance between screen printing and a math course or screen printing and an English course.” Considering that comment with a CTE administrator’s thoughts that “it would be most useful to start by having a platform by which all academics have gotten to an integrated state.” The horizontal sharing of information and collaboration between high schools and districts must improve in order to effectively implement and sustain integrated CTE programs. Without that mentorship, teacher and curriculum support sustaining a Linked Learning program could be more difficult (Hubbard, 2012).

In addition, the segregation of CTE and academic tracks could cause educational leaders to ignore studies that supported increased understanding as a product of connecting concepts through the integration of subjects into a single curriculum (Bond & Navarra, 2012). Saunders and Chrisman (2008) also found that applying abstract concepts through project-based learning could help increase student comprehension. These findings were consistent with data results from this study where a significant majority or 79.4% of GUSD graduate survey respondents indicated that their CTE course of study helped them understand concepts in other academic classes, such as math and English. All GUSD survey respondents attended Title I schools.

Other research presented in Chapter 2 noted that Linked Learning programs helped increase student achievement in California districts (Guha et al., 2013; Rustique & Rutherford-Quach, 2012; Saunders, 2013), but none of the studies focused on a
more-affluent school or district. To date, data are inconclusive on how beneficial programs of study such as Linked Learning are in more-affluent districts. Many who attend schools that do not qualify for Title I funding within the GUSD likely benefit from a structure that does not routinely nor specifically endorse an integrated CTE syllabus.

During the high school graduate focus group, one of the participants who graduated in an architectural program of study and was working toward a college degree in architecture noted that his favorite classes were his CTE classes. He stated that although his instructor “just barely got his teaching degree, [h]e was actually in the field, so we were learning firsthand knowledge.”

**Personalized Learning Options**

Bishop and Mane (2003) noted that when students are given a choice to take CTE courses, those students experience an increase in retention and graduation rates. One of the GUSD graduate focus group participants concurred with that finding by stating, “If it’s a CTE, an elective kind of thing where you can choose to go in just to learn, like a knowledge based thing—word will get around that it’s a great class and it really helps.” This concept illustrates that applicability to real world utility is an important factor that will guide student enrollment decisions.

The data in this study support the belief that students demand control of their lives prior to coming in to high school. Providing students with the tools and capacity to develop higher order thinking skills and P-21 (Partnership for 21st Century) skills to support a successful transition to post-high school life must be a top educational priority. In order to best accomplish that goal, educational leaders must take a more holistic perspective. As the former GUSD CTE Director stated, educational leaders would be
best served if they were to “get the universities at the table and really [take] a look at the pre-K through grade 16 concept.” Data and information from external sources will need to be factored in to future structural and curricular decisions to an even greater extent.

Career Technical Education programs of study may have been designed, in some degree, to provide options to students with diverse interests. Grand Union School District graduates who participated in the focus group commented that having course options in school had a positive effect on engagement. The survey results also supported this position as 90.5% of the respondents agreed with the statement that they enjoyed high school because of an ROP/CTE course of study. In a different survey question, 88.9% of the students agreed that their ROP/CTE course of study helped them graduate from high school. The third survey question found 82.5% of respondents agreeing that a ROP/CTE course of study motivated them to remain in school.

These data align with the study by Castellano and colleagues (2012), which noted that students participating in an integrated CTE POS were significantly more on track to graduate than non-POS students. Other studies corroborated findings that students in CTE POS curriculums were more motivated, more likely to graduate, and more likely to persist in postsecondary education (Alfeld & Bhattacharya, 2013; Hughes et al., 2012).

Implications

In order to increase student preparedness, retention, and graduation rates for postsecondary challenges, it is critical to consider the skills and abilities students will need after high school. A significant number of students are identifying potential career paths prior to high school enrollment. This study identified a potential opportunity for high schools and their districts to consider restructuring their curriculum and their
organizational structure in order to improve postsecondary student outcomes. Although this prospect would demand the reallocation of resources, improved student readiness could result. Not all students will be able to definitively choose a career path entering their freshmen year in high school. However, the data suggest that arming students with more knowledge to make informed choices would be in their best interest. The implications of these findings could lead educators to expose students to a wider variety of career choices prior to high school in order to help them make a more informed choice when enrolling in high school classes as freshmen.

This research found that students and teachers supported a curriculum that offered constructivist options and complements to academic classes. Connecting abstract concepts to real world scenarios may increase engagement, as well as comprehension; thus that type of learning could be valuable to a broad variety of students. If the Common Core State Standards (CCSS) were designed to apply abstract concepts to real-life scenarios, the integration of CTE, with subjects such as English and math, would contribute to overall goals of CCSS. Giving students options that provide tangible ways to connect learning to their environment may warrant more serious consideration from districts and high schools, even some that have been benefitting from more traditional structures and curriculums.

It is important to expose students to information on a wide variety of possible career paths, so an informed decision may be made regarding high school and class choice. To support that plan, increased collaboration at every level from K-16 would best configure the system with the choices that best fit industry’s needs, as well as the interests of the students. Under these circumstances, secondary schools could act as an
informational conduit, as well as an education provider. Horizontal and vertical collaboration must be applied not only between officials and educators across educational levels, but must also increase across the business and community sectors. Unfortunately, with school budgets stretched, it is not always feasible for high schools or districts to provide structure to support the necessary collaboration.

However, nodes of communication and collaboration could be established, enhanced, and maintained by private business sources acting as advisors and mentors. These agencies could help guide the development of the most appropriate and responsive structure to support regional, state, and national requirements. These particular nodes of communication could then help provide the longitudinal data and feedback from district high school graduates/employees back to the high schools and other educational institutions that would use the data to adjust the curriculum and other factors that influence and prepare their students.

**Recommended Future Research**

More research is needed to clarify the utility and effectiveness of CTE pathways and academies in order to justify the resources that high schools and districts must redistribute to support the implementation of an integrated CTE pathway program. Research should not be limited to less-affluent urban schools, but should consider improving the experiences and outcomes of all high school students that will best prepare them for a global twenty-first century market economy. Educational innovators and leaders will need more longitudinal research to insure resources and energy are directed and concentrated where most appropriate. Longitudinal studies have been and are currently being conducted by a nonprofit university-affiliated research organization for
the National Center for Educational Statistics (NCES) since 1988. The organization’s
tri-annual report gathers information from surveys on outcomes of postsecondary cohorts.
Although this research is conducted at a national level, districts could refer and make
adjustments to the instruments used to model surveys that would best fit their needs over
an extended period of time. This type of research would supply data that would include
information on high school graduate employment and careers, job-related training,
certification and licensure, as well as postsecondary education. This longitudinal data
could also provide insight that could shape an integrated CTE program that would
directly contribute to CCSS standards and objectives.

Further longitudinal research that follows student cohorts from various
demographic backgrounds from freshman year, through postsecondary graduation, and
for years into their college and/or career is needed. Collecting data from graduates 1 year
after high school graduation provides too narrow a picture of postsecondary high school
experiences and outcomes. However, tracking student progression through integrated
CTE or Linked Learning pathways from freshman through senior year would provide a
more complete feedback for these integrated programs. As it stands, data on students
involved in integrated CTE programs are not providing enough information on student
engagement, attendance, and graduation rates in order to make informed and competent
curriculum adjustments.

It would be valuable to compare data from this study against data from CTE
programs of study in more affluent high schools. Student performance and attendance
data from a more affluent high school that adopted an integrated program would provide
a broader base for comparison and improve the accuracy and generalizability of the
findings. In many instances, data from other research studies cited in this report came from less-affluent high schools. Perhaps more affluent high schools are content with their current curricular structure, as it may have supported their students well. Perhaps educators and stakeholders from more affluent high schools believe that changing to an integrated CTE or Linked Learning philosophy or structure might adversely affect outcomes for their high school graduates. The implementation of integrated programs such as Linked Learning at more affluent high schools might also combat the persistent stereotypes associated with CTE programs of study identified in Chapter 2.

Based on the data collected, it is important to look for more opportunities to build on the potential benefits of cross-departmental vertical and horizontal collaboration for educators in order to improve student engagement and the understanding and application of abstract concepts to postsecondary options such as college or career.

Further research on the efficacy of horizontal and vertical collaboration in curriculum design and development is needed to better understand how data on student outcomes is influencing curriculum decisions. Studies would not necessarily be limited to district educational agencies, but could extend into institutions of higher learning, businesses, and other community and governmental agencies. This research should focus on the quality and quantity of communication and collaboration and how it helped insure students were receiving the maximum benefit possible. This research could also examine if building these nodes of communications would establish relationships that may affect the student’s level of engagement, attendance, retention, or graduation rates. A continual cycle of evaluation, application, reflection, and adjustment must be implemented as part of program sustainment.
As our high schools continue to transition to Common Core, new and innovative technologies will likely be applied during the implementation. Considering the pace of technological change, especially how it will be experienced in education, it would be easy to focus on the performance improvement potential created by those technological classroom advances. However, doing so might overlook the importance of student input on how those changes could be affecting postsecondary outcomes. Listening to, understanding, and responding to student feedback provides vital perspective to educational decisions.

Finally, further comparative research that considers student perceptions of various integrated CTE curricula should be conducted. Some CTE pathways such as international business may consist of a technical core of four or more courses that meet industry standards. Students in these more structured pathways would likely experience more work-based and real-world learning opportunities through all 4 years of high school. Many of these program types exhibit characteristics of a Linked Learning approach at a themed high school. Other integrated CTE programs of study are not as structured, allowing students to enroll in CTE courses as electives throughout high school, and are not linked to a particular pathway. Comparing student perceptions and outcomes between these different approaches to an integrated CTE program of study could provide important and persuasive data.

**Summary and Conclusion**

When 30% of students who begin high school do not graduate, there is a problem. When 85% of students who entered Linked Learning sites as freshmen graduate from
high school, it might cause some educational institutions to rethink their structure and practices.

School should be so much more than academia. With the passage of California Senate Bill 1458 (California Legislative Information, 2012), the effectiveness of a school will not solely be measured through student performance on standardized tests. Instead 40% of the school’s evaluation will be decided by other indicators, such as graduation rates, attendance, number of suspensions, postsecondary job placement, or a list of other criteria. If the only criteria to evaluate the success of a high school were the percentage of students who went on to enroll in a 4- or 2-year college, there would be a vast amount of other factors the criteria ignored. Other educational goals include the social development of students; building individual self-concepts, recognizing personal strengths, and helping them determine how to best contribute to society, while maintaining a positive standard of living. If the main measure of a successful high school program was enrollment and educational continuance in a 4- or 2-year college, success would be defined in terms that limit other possible educational outcomes.

Since it is estimated that nearly two-thirds of jobs through 2018 will require workers with at least some postsecondary education (Symonds, 2011), preparing high school students for some form of higher education is critical. Another alternative outcome for students who do not finish college, but have received some skilled training through postsecondary education or a CTE course of study could be a higher paying entry level job. In either case, people with a CTE course of study in high school could have more options upon arrival to and/or departure from college.
High school students are discerning consumers of information presented in high school. As one GUSD graduate stated when referring to the quality and utility of a class, “word will get around.” Communication links through social media and the internet will accelerate the speed at which students provide one another feedback on the utility of high school classes and how they have helped prepare students for postsecondary life. Communication nodes between high schools, middle schools, elementary schools, community colleges, and universities must keep pace with the ever-increasing speed of advancing technologies. Nodes of communication and collaboration must also extend out into the businesses and communities in order to better understand how to better prepare students for postsecondary life. However, educational institutions have not been nearly as adept at sharing information and data. Some longitudinal studies were presented during the literature review, but the GUSD could not access precise longitudinal data on the graduation rate of CTE pathway students. Improving the methods to track the progress and retention of CTE pathway students would be invaluable to evaluate the efficacy or viability of Linked Learning programs of study. Without proper feedback channels, educators may not be able to accurately initiate effective curriculum adjustments. If public education does not meet the needs of its customers, they could become impatient with an antiquated system that is “not relevant to life after high school” (Stone et al., 2008) and look elsewhere. It is, therefore, incumbent upon high school educational leaders to anticipate those needs through increased communication and data tracking and analysis.

It is important to foster an educational atmosphere where all students feel they can succeed and achieve—not only students who excel academically, but where every
student’s individual skills, talents, and abilities are recognized, nurtured, and appreciated. The global market of the twenty-first century will need a diversified work force capable of making unique contributions and solving problems that today’s society cannot yet fathom. Excluding any child by primarily acknowledging academic proficiency and not cultivating the potential growth that could be realized through the integration of CTE pathway programs and core academics may not be in the best interest of the child and could be detrimental to society.
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APPENDIX A

Career Technical Education Director Interview Questions

1. What can the SDUSD do to improve the preparedness of high school students who enroll in integrated curriculums who (R):
   a. Go on to college
   b. Go on to technical school or Community College
   c. Enter the work force

2. What are some of the district supports available to schools in pathway programs that may help increase student achievement (S)?
   a. Will any supports help build capacity for integrated curriculum pathway programs such as Linked Learning (S)?

3. What is one thing you would like to focus on that you believe would improve the achievement of students enrolled in integrated curriculum pathways within the district (E, S, R)?

4. What is your reaction to the research data presented? Does it align with your expectations?
APPENDIX B

Student Focus Group Questions

1. What motivated you to go to high school and complete your diploma requirements (E)?
   a. (Probe) What were some of the main reasons why you went to school (E)?
   b. (Probe) Which classes did you enjoy the most during high school (E)?

2. Describe the most important supports you received during high school that kept you focused and helped you succeed (S).
   a. (Probe) Who did you turn to for help with any challenges that came up in high school (S)?
   b. (Probe) Which teachers best prepared you for life after high school (S)?

3. Do you think you would have graduated from high school if you were not enrolled in
   a. ROP/CTE course of study (E, S)?

4. Would you identify any skills/abilities you learned in high school that were particularly helpful in your post-high school experience (R)?
   a. Which classes taught you the skills you find most useful in your post-high school life (R)?
   b. Where do you expect to go in the future (R)?
Thank you for your voluntary participation in this study. This study will seek high school graduate perceptions of the efficacy of integrated Career and Technical Education (CTE) and core academic programs and student outcomes from those programs. Your responses will be held in strict confidentiality and will not be connected to your name or other personal identification. Since this study is completely voluntary, you are not obligated to complete it and may stop at any time (The CCTE department of the SDUSD will tailor the introductory and statement of purpose to align with their intent of the survey. Information will reflect introductions and/or purposes from previous surveys). Your input and opinion is highly valued and greatly appreciated!

1. I am at least 18 years of age (check “Yes” or “No”—“Yes” response will prompt contact information at the end of the survey, respondents under 18 will not have option to come in for focus groups).
2. What high school did you graduate from? (drop-down menu, this information automatically populates “High School” in the volunteer registration at the end of the survey)
3. Please identify the academy, Regional Occupational Program/Career Technical Education (ROP/CTE), or Linked Learning program course of study you participated in at your high school (i.e., Technical Arts, Digital Media Design, or School of Business and Leadership)? (drop-down menu, linked to previous question)
4. Please identify the reason(s) you decided to take these ROP/CTE courses in high school (drop-down menu with the following choices; friends, family, teacher, to train for a possible career, other—please write in-)

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<th>Please check only one box that most closely applies to your current situation:</th>
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<tr>
<td>1. Serving in the military</td>
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<td>2. Attending a 2-year college</td>
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<td>4. Attending a technical school/certificate program related to your high school course of study</td>
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<td>5. Employment in a job related to your high school course of study</td>
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<td>6. Employment in a job NOT related to your high school course of study</td>
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<td>7. Combination of attending college and working in a job related to your high school course of study</td>
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<td>8. Combination of attending college and working in a job not related to your high school course of study</td>
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<td>9. Not working or attending a college or university</td>
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<td>My ROP/CTE course of study helped me graduate from high school</td>
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<td>I enjoyed high school more because of my ROP/CTE course of study</td>
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<td>My ROP/CTE course of study motivated me to stay in school</td>
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<td>I took a ROP/CTE course of study because my friends were enrolling in the same program</td>
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<td>8</td>
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<tr>
<td>My ROP/CTE course of study prepared me for work after high school</td>
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<tr>
<td>My ROP/CTE course of study prepared me for classes after high school</td>
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<td>10</td>
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<tr>
<td>Because of my ROP/CTE course of study, I feel better prepared for life after high school compared to other people my own age</td>
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*Key to Code defining the type or purpose of each question: (E = Engagement, R = Readiness, S = Social Factor, Sub-category of Engagement)*

Is there any other information you would like to provide that might have improved your educational experience?_____________________________________________________________________
___________________________________________________________________________
___________________________________________________________________________

(The following section is enabled providing the subject indicates at the beginning of the survey that they are 18 years old): Please indicate if you would like to volunteer for a follow-on discussion group designed to better understand student perspectives on high school experiences (Y or N drop-down menu—if “Y,” then student is able to fill in the prompts below)?

In order to volunteer, please type in your contact information (cell phone and/or email):
Name: _______________________________ High School: (populated from beginning)

Contact phone number: ______________________________

Email address: _______________________________

Thank you! You will be contacted within the next few weeks.
APPENDIX D

Interview Protocols—Educators

Informed Consent

San Diego State University
Department of Education Leadership
INFORMED CONSENT FOR ADMINISTRATORS AND TEACHERS

TITLE OF STUDY: Perspectives of Pathway and Linked Learning Outcomes for High School Student Graduates

RESEARCHER: Brian Josten, Doctoral Candidate
DISSERTATION CHAIRPERSON: Patti Chance, Ph.D.

Contact Information
If you have any questions or concerns about the study, you may contact Brian Josten at (760) 703-1310. You may also contact the Institutional Review Board at San Diego State University to report any problems or concerns related to this study at (619) 594-6622.

Purpose of the Study
You are invited to participate in a research study. This study will seek educator perceptions of the efficacy of integrated Career and Technical Education (CTE) and core academic programs, student outcomes from those programs and reactions to data gathered through a student survey.

Description of the Study
You are being asked to participate in this study because you are associated with a high school identified in a recent student survey that provided an integrated CTE and core academic curriculum. If you volunteer to participate in the study you will be asked to participate in one 45 minute face-to-face, focus group at your site. Focus groups and interviews will take place in a private office or room on your campus. Your identity will be coded in order to protect your privacy. Focus groups and interviews will be audio-recorded.

Risks of Participation
There are risks involved in all research studies. This study includes only minimal risks. You may feel uncomfortable answering some of the questions asked. You are encouraged to discuss this with the researcher and he will explain the questions to you in more detail. You may choose not to answer questions that make you feel uncomfortable and may discontinue your participation at any point.
**Benefits of Participation**
There may be no direct benefits to you as a participant in this study. However, the researcher hopes to learn about the effectiveness of integrated career and technical education pathways and the program’s effect on student engagement, graduation rates, and ability to succeed in the postsecondary, global 21st century.

**Cost/Compensation**
There will be no financial cost to you to participate in this study. You will not be compensated for your time. San Diego State University may not provide compensation or free medical care for an unanticipated injury sustained as a result of participating in this research study.

**Voluntary Participation**
Your participation in the study is voluntary. You may refuse to participate in this study and you may withdraw at any time without prejudice to your relations with the school or the university. You are encouraged to ask questions about the study at the beginning or at any time during the research study.

**Confidentiality**
All information collected for this study will be kept confidential. No reference will be made in written or oral materials that could link you to this study. All information gathered for this study will be stored in a locked file cabinet at the researcher’s home for at least 3 years after completion of the study. At that time information gathered will be destroyed.

**Taping**
I agree to be audio recorded for the purpose of the study.

**Participant Consent**
Please retain this copy for your reference.

_________________________  ________________________  ____________
Signature of Participant    Participant Name (Please Print)    Date

_________________________  ________________________  ____________
Researcher Signature        Researcher Name (Please Print)    Date
APPENDIX E

Interview Protocols—High School Graduates

San Diego State University
Department of Education Leadership

INFORMED CONSENT FOR HIGH SCHOOL GRADUATES

TITLE OF STUDY: Perspectives of Pathway and Linked Learning Outcomes for High School Student Graduates

RESEARCHER: Brian Josten, Doctoral Candidate
DISSERTATION CHAIRPERSON: Patti Chance, Ph.D.

Contact Information
If you have any questions or concerns about the study, you may contact Brian Josten at (760) 703-1310. You may also contact the Institutional Review Board at San Diego State University to report any problems or concerns related to this study at (619) 594-6622.

Purpose of the Study
You are invited to participate in a research study. This study will seek educator perceptions of the efficacy of integrated Career and Technical Education (CTE) and core academic programs, student outcomes from those programs and reactions to data gathered through a student survey.

Description of the Study
You are being asked to participate in this study because you volunteered to participate in a focus group after completing a survey on the impact of an integrated CTE and core academic curriculum on student engagement, supports, and how that program prepared you for post-high school life. If you volunteer to participate in this portion of the study you will be asked to participate in one 45 minute face-to-face, focus group at your site. Focus groups will take place in a private office or room on your campus. Your identity will be coded in order to protect your privacy. Focus groups and interviews will be audio-recorded.

Risks of Participation
There are risks involved in all research studies. This study includes only minimal risks. You may feel uncomfortable answering some of the questions asked. You are encouraged to discuss this with the researcher and he will explain the questions to you in more detail. You may choose not to answer questions that make you feel uncomfortable and may discontinue your participation at any point.

Benefits of Participation
There may be no direct benefits to you as a participant in this study. However, the researcher hopes to learn about the effectiveness of integrated career and technical
education pathways and the program’s effect on student engagement, graduation rates, and ability to succeed in the postsecondary, global 21st century.

**Cost/Compensation**
There will be no financial cost to you to participate in this study. You will be compensated for your transportation expenses. San Diego State University may not provide compensation or free medical care for an unanticipated injury sustained as a result of participating in this research study.

**Voluntary Participation**
Your participation in the study is voluntary. You may refuse to participate in this study and you may withdraw at any time without prejudice to your relations with the school or the university. You are encouraged to ask questions about the study at the beginning or at any time during the research study.

**Confidentiality**
All information collected for this study will be kept confidential. No reference will be made in written or oral materials that could link you to this study. All information gathered for this study will be stored in a locked file cabinet at the researcher's home for at least 3 years after completion of the study. At that time information gathered will be destroyed.

**Taping**
I agree to be audio recorded for the purpose of the study.

**Participant Consent**
Please retain this copy for your reference.

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APPENDIX F

Administrator Interview Questions

1. Do the programs or pathways that integrate or link various disciplines (such as math, English, social science, and CTE) help keep students enrolled and engaged (E)?
   a. (Probe) Could you provide any examples of students who you believe may have remained in school and graduated because of integrated Pathways or Linked Learning (LL) programs (E)?
   b. (Probe) Did you notice any difference in student attendance between students in integrated curriculum pathways such as LL and those students not in those programs (E)?
   c. (Probe) Are there any differences in behavioral issues such as suspensions or absenteeism that you have noticed between students from integrated curriculum pathway programs such as LL and students not in those programs (E)?

2. Are parents of students in integrated curriculum pathways such as LL more actively involved than those students not in those programs (S)?
   a. (Probe) What different parental behaviors did you notice with students in integrated curriculum pathways such as LL (S)?

3. Do you know what your students went on to achieve after they graduated (R)?
   a. Do you have any data on those outcomes (R)?
   b. How do you think integrated curriculum pathway programs such as LL helped to prepare your students for postsecondary life (R)?

4. What is one thing you would like to focus on that you believe would improve student achievement at your school (E, S, R)?

5. What is your reaction to the student data presented from the survey? Does it align with your expectations?
APPENDIX G

Teacher Focus Group Questions

1. Describe some of the pathways and integrated CTE/core academic curriculum at your school (Introductory).

2. How would you characterize engagement of students in integrated pathways or LL programs at your school (E)?
   a. (Probe) Is the attendance of students in integrated pathways different than other students at your school (E)?
   b. (Probe) Could you provide any examples of students who you believe may have remained in school and graduated because specific programs at this school (E)?
      i. (Probe) Were those students you described integrated pathway students?

3. Do students who complete an integrated pathway program at your high school seem to be better prepared than other students for postsecondary life in the 21st century (R)?

4. Do you know what your students went on to achieve after they graduated (R)?
   a. What were some of the outcomes for integrated pathway students (R)?

5. Do students in integrated pathways seek teachers outside of class any more often than other students in order to ask for assistance in academic areas (S)?
   a. (Probe) What about nonacademic areas (S)?
   b. (Probe) Are teacher relationships with students from integrated pathways any different than teacher relationships with other nonintegrated students (S)?

6. What is one thing you would like to focus on that you believe would improve student achievement at your school (E, S, R)?

7. What is your reaction to the student data presented? Does it align with your expectations?