A COMPARATIVE STUDY OF THE
IMPACT OF LINKED LEARNING ON THREE URBAN HIGH SCHOOLS

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A COMPARATIVE STUDY OF THE IMPACT OF LINKED LEARNING ON THREE URBAN HIGH SCHOOLS

Abstract

This study examines the impact of Linked Learning's Pathways on the three variables (a) student engagement; (b) school success; and (c) academic achievement of students in the three comprehensive high schools in an urban school district in the Bay Area.
California State University, East Bay  
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DEDICATION

To my parents, Barbara and Wendell Carlton Greer, Sr., who established a tradition of expecting the best of their four children; daily, I strive to honor them in all that I do. To my wife, Dr. Gail Spann-Greer, who has supported me in every step of this process. And finally, to my children, Jordan Anysia Greer and Wendell Carlton Greer, III, you give me hope for our future.
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CHAPTER 1

Introduction

Since the 2008 recession, policymakers have given the nation’s network of public schools and institutions of higher education in the United States a tough assignment. They hope these institutions will improve the availability of a qualified workforce for the knowledge economy. Their strategy rests on a belief that closer partnerships between the K-16 education sectors will lead to better systems for raising the skills of workers for better paying jobs in industry (Yarnall et al., 2011).

Economists predict the ripple effects of the 2008 recession will accelerate changes in the U.S. economy that were already well under way (Carnevale, Smith, & Strohl, 2010). United States workers will continue to see their jobs go overseas as global employers seek more affordable and better-trained employees. Technological innovations stemming from the Internet-driven information revolution will continue to shrink once robust job sectors and make it possible for distant workers to undercut the cost of local hires. Students entering the nation’s post secondary institutions from the K-12 education system are continuing to perform more poorly in all subjects, particularly mathematics and science, than their peers in Europe and Asia. Owing to demographic shifts and K-12 educational challenges, an increasing number of U.S. students come from immigrant families or families without a tradition of postsecondary education. Postsecondary
students abroad are attending and completing college in greater numbers than before, a
trend that has knocked the United States from its historically unique position of having
the highest proportion of its citizens with college credentials (Yarnall et al., 2011).

Because the workforce is highly differentiated, with workers in different sectors
requiring different knowledge and skills, high schools have developed a correspondingly
differentiated curriculum. Academic courses aim at preparing students for occupations
that require college degrees; more rudimentary classes and vocational programs ready
students for careers immediately following high school graduation or for postsecondary
technical training (Williams, 2005).

Farr et al. (2009) asserted that California schools, like most others in the nation,
too often have treated academic and technical studies as an either/or proposition. This
dichotomy has not served students or society well. Far too many students are dropping
out of school, and many others earn a diploma without truly mastering the knowledge and
skills necessary for life after high school.

In order to help students negotiate the complexity of the workplace, it is important
to place them on a pathway that prepares them for the responsibilities and expectations
they will encounter in the workplace. This pathway can involve various forms of work
experience integrated into the curriculum (Billett, 2001).
There are no simple solutions to this problem, no one right way. One promising strategy, however, is the multiple pathways approach—comprehensive programs of study that connect classroom learning with real-world applications outside school. Pathways integrate rigorous academic instruction with demanding technical curriculum and work-based learning—all set in the context of one of California’s 15 major industry sectors. These sectors include the arts, media, and entertainment; biomedical and health sciences; building and environmental design; engineering; information technology; law and government; and 10 others (ConnectEd, 2008).

According to Williams (2005), many policymakers are challenging the traditional split between the academic and vocational sides of the curriculum. This challenge stems from the growing perception that, with the profound economic and social shifts currently facing the nation, a curriculum divided into distinct academic and vocational groups is no longer either useful or fair. Instructional practices such as small learning communities, career pathways, and integration of academics into all subjects have a positive impact on student learning and retention.

Schneider and Stevenson (1999) pointed out that adolescents with aligned ambitions have complementary educational and occupational goals, those with misaligned ambitions have goals that are not realistically connected to a particular occupation. Those with aligned ambitions see life events as sequentially organized and
are more likely to strategically plan their actions to reach their goals. Defining an educational and career pathway for high school and college students, one that links high school, college, and work, makes a pathway explicit for students, enables them to experience career options, and supports their decision-making (Ryken, 2006).

Linked Learning

The California Linked Learning District Initiative is in its fifth year. Funded by the James Irvine Foundation and supported by a collection of partner organizations, the initiative has provided significant support to nine school districts to design, develop, and implement ambitious, career-themed pathways as a way to better prepare high school students for college, careers, and life after graduation. What began as a nine-district initiative, situated in small and large districts representing the state’s diversity, is now rapidly expanding. The state Linked Learning Pilot Program was authorized in 2011 with the passage of Assembly Bill 790, which encourages districts to form regional partnerships and work closely with community organizations and local businesses to implement career-themed Linked Learning programs. A total of 63 local educational agencies were selected to participate in the first year of the pilot program, which is managed by the California Department of Education, and when the pilot program is fully implemented, Linked Learning will be available to more than one third of the state’s high school students (Linked Learning Alliance, 2013).
Linked Learning shifted the paradigm from earlier vocational education programs. This initiative has attempted to respond to a changing economic world that demands that students develop the knowledge and skills provided by both an academic and career curriculum. To hold true to its promise and avoid the pitfalls of CTE (Career Technology Education) predecessors, however, Hubbard and McDonald (2014) recommended that reform-minded educators must face the structural and cultural challenges posed by the multiple contexts in which educators and students are embedded. It is likely that a successful marriage of academic and career readiness, an equitable path for all students, will be achieved only when the significant challenges at all levels of the system are taken into account.

In a study of the Linked Learning intervention, Hubbard and McDonald (2014) found that constructing change for the vast number of high school students who have previously been disengaged in school requires more than a technical fix. Although educators, policymakers, and communities participating in Linked Learning dismantled tracking arrangements and attempted to couple a career and an academic curriculum, they found that their efforts were challenged by several factors. These factors were most visible by examining the ways in which Linked Learning educators were embedded within wider school, district, and state contexts – contexts that presented both structural
and cultural challenges. One of these challenges included the teacher relationship or rapport with students.

Farr et al. (2009) suggested that one promising strategy for engaging students in learning that prepares them for several options after graduation is the multiple pathways approach being considered by high schools. Multiple pathways are comprehensive programs of study that connect classroom learning with applications in the real world outside school. Pathways integrate rigorous academic instruction with demanding technical curricula and work-based learning. This approach shows promise for being an effective method to enhancing the engagement and learning of students, while also preparing them effectively for a wide range of careers. The potential of this tactic warrants additional research attention, since the propensity of high school students to disengage and to feel disconnected from school is so well known.

According to Guha et al. (2014), Linked Learning combines four elements designed to advance student success

- Rigorous academics. An academic core that includes college preparatory English, mathematics, science, history, and foreign language courses for all students.
- Real-world technical skills. A challenging career-based component of three or more courses to help students gain the knowledge and skills that can give them a head start on a successful career.
• Work-based learning. A series of work-based learning opportunities that begin with mentoring and job shadowing and evolve into intensive internships, school-based enterprises, or virtual apprenticeships.

• Personalized support. Services including counseling and supplemental instruction in reading, writing, and mathematics that help students master academic and technical learning.

To date, the nine districts participating in the California Linked Learning District Initiative vary in size and include rural and urban geographies. High school enrollment in these districts ranges from nearly 5,000 to 200,000 students. Collectively, they serve more than 315,000 of the roughly 2 million high school students enrolled in California public schools. The nine districts include Antioch Unified, Long Beach Unified, Los Angeles Unified, Montebello Unified, Oakland Unified, Pasadena Unified, Porterville Unified, Sacramento City Unified, and West Contra Costa Unified. More than three-quarters of the students in each of these districts are non-White and over half in each are socioeconomically disadvantaged (Guha et al., 2012).

Linked Learning integrates rigorous academics with real-world experiences to provide students with a personally relevant, wholly engaging high school experience. The ultimate goal is to improve high school graduation rates and increase successful
transitions to a full range of postsecondary education opportunities, particularly for low-income and disadvantaged youth (SRI International, 2014).

The Linked Learning District Initiative has a strong equity agenda. In theory, the initiative aims to make pathways available district-wide to any student who chooses to enroll. The assignment of students to schools and programs is an annual event that is driven by district policies and processes around pathway recruitment and choice. Ideally, these policies and processes would build towards coherent district-wide recruitment and choice systems (Guha et al., 2012).

Farr et al. (2009) explained that in April 2006, The James Irvine Foundation created ConnectEd: The California Center for College and Career to promote innovative practice, policy, and research to better define and expand multiple pathways in California’s high schools. ConnectEd (2008) defined the multiple pathways approach based on four guiding principles and four components, as follows

1. Prepare students for postsecondary education and career. A pathway must always address both objectives. Acknowledging that career success depends on postsecondary education and a formal credential, ConnectEd staff affirm that a pathways approach cannot reflect separate programs for different groups of students.
2. Connect academics to real-world applications. Implementing a pathways approach means altering how core academic subjects are taught. Students master core subjects through applying them in the real world.

3. Lead to the full range of postsecondary opportunities. Pathways are designed to prepare students for all the options they might pursue after graduation from high school. Each pathway is tied to a particular industry theme that can engage any student, regardless of prior academic achievement.

4. Improve student achievement. Pathways are designed to produce higher academic and technical achievement, higher rates of high school completion, more successful transitions to postsecondary education and careers, and greater attainment of formal postsecondary credentials. They are also designed to support the development of students’ critical-thinking and problem-solving, communication, and collaboration skills.

As the initiative encourages districts to examine their assignment policies and consider any changes needed to address issues of equitable student choice, districts will need to consider who is attending Linked Learning programs and how they came to be
there. To that end, this chapter provides context on district pathway recruitment and choice policies and describes the characteristics of students who choose pathways (Guha et al., 2012).

**Background**

**The Achievement Gap**

Achievement gaps occur when one group of students outperforms another group and the difference in average scores for the two groups is statistically significant (National Center for Education Statistics, 2014). Two criteria must be met in order for the gap to narrow and eventually close: (a) achievement for lower-scoring subgroups must increase and (b) the increase must be at a faster rate than for the higher-scoring comparison group (Center on Education Policy, 2009).

Fusarelli and Fusarelli (2003) noted that the persistence of achievement gaps among ethnic groups has become a concern of federal and state policy makers as student achievement, particularly in urban schools, remains abysmally low. In 2000, for example, the Black-White gap in terms of high school graduation still favored Whites, although it had been reduced from 22 to 6 percentage points between Black and White racial groups. While there is some evidence that over the past 50 years, the Black-White gap in terms of educational attainment has been narrowly closing, the gap remains a cause for concern for many ethnic groups and children of poverty (Willie & Reddick, 2003).
Today, the achievement gap prevails. Data collected in 2009 by the U.S. Department of Education indicated that a substantial proportion of Latino students in grades four (37%) and eight (21%) are English Language Learners. These two facts - the growing size of the Latino population in the United States and the percentage of fourth- and eighth-grade Latino students that are English Language Learners - underlies the achievement gap between Latino and White fourth- and eighth-graders. Closing the Latino-White achievement gap remains a challenge. While Latino students’ average scores have increased across the assessment years, White students had higher scores, on average, on all assessments (National Center for Education Statistics, 2014).

The Center for Teaching and Learning (2010) divulged that overall student achievement trends in California have been rising. For example, since 2002–2003, the percentage of California students scoring proficient or above on the California Standards Test (CST) has risen from about a third to about one half. But the wide disparity between the academic achievement of African American and Latino students on the one hand and White and Asian students on the other has remained steady over the decade.

While the last decade of California Standards State testing outcomes (2002-2012) has reflected a certain degree of improvement in student academic performance, student achievement gaps persist in many urban school districts. For example, in 2013 at the state level, the gap in English Language Arts between the lowest performing subgroup
(African American) and the highest performing subgroup (Asian) in grade 10 depicts a difference of 38 percentage points (California Department of Education, 2014).

Miller (1995) argued that schools with diverse student populations are challenged by the pervasiveness of the student academic achievement gap. Beyond the moral and ethical responsibilities, the researcher contends, there is a just cause for the narrowing of the achievement gap. The continued existence of substantial minority-majority educational gaps is prohibitively costly, not only for minorities, but for the nation as a whole. Among the most compelling reason for seeking to eliminate this gap is simply that the achievement of significantly higher minority education levels is essential to the long-term productivity and competitiveness of the U.S. economy.

**The Common Core Standards Movement**

Jaquith, Martin, and Johnston (2014) recounted that intentionally open to all students, Linked Learning Pathways aimed to provide each student with a meaningful education. This requires having pathways that are replete with effective instruction and having district systems of assessment designed to improve student learning. Achieving these ambitious goals is difficult. Whatever approach a district takes to introduce and grow Linked Learning the process of change demanded by this reform movement is significant at all levels of the system: Districts must manage the integration of Linked Learning and the Common Core State Standards (CCSS); figure out how to design,
implement, and assess the work-based learning emphasis of their pathways; and support the creation of a system of performance assessments that are credible, defensible, and aligned to the expectations of the CCSS and stated pathway outcomes.

The Common Core State Standards (CCSS) offer a combination of social efficiency and liberal studies according to Beane (2013). Their purpose is to prepare young people for future roles in college and/or work, to meet the labor force skills the sponsors believe are needed, and to enhance the United States’ role in global economic competition. In the early days of the social efficiency movement, Snedden (1925) (as cited in Beane, 2013) defined training for various roles and occupations in terms of prescribed sequences of discreet skills called “peths”. The number of “peths” on the path to success in various roles or occupations might vary from the tens to the hundreds. The way the Common Core State Standards are detailed and parsed out by grade levels suggests that literacy and numeracy skills are the “peths” of the new, technical world (Beane, 2013).

The goals of the CCSS, to better align educational standards with workplace expectations and to encourage more rigorous skill development, are admirable cautions. The task now is to implement the standards in ways that will yield the greatest benefits to students and schools in this country. For teachers in the English/Language Arts, this
implementation raises important questions about the kinds of texts that best support these standards in our classrooms (Ostenson & Wadham, 2012).

The Standards define what all students are expected to know and be able to do, not how teachers should teach. For instance, the use of play with young children is not specified by the Standards, but it is welcome as a valuable activity in its own right and as a way to help students meet the expectations in this document. Furthermore, while the Standards make reference to some particular form of content, including mythology, foundational U.S. documents, and Shakespeare, they do not, indeed, cannot, enumerate all or even most of the content that students should learn. The Standards must therefore be complemented by a well-developed, content-rich curriculum consistent with the expectations laid out in the standards (Social Science Docket, 2013).

That the CCSS are a top-down policy thrust is inarguable. What is lacking from the CCSS movement, however, is a clear understanding of how standards like these are to narrow the achievement gap - the catalyst behind school reform (McIntyre & Kyle, 2006).

**Problem Statement**

In a study of high school reform models, Quint (2006) noted that the movement of high school reform to the top of the policy agenda was precipitated by rapidly growing concern about high dropout rates and low academic achievement, particularly among
disadvantaged young people. The message from this study was that structural changes to improve personalization and instructional improvement are the twin pillars of high school reform.

Smyth and Hattam (2004) indicated there are three key factors influencing students’ decisions to become non-completers and leave school before graduation (a) work and employment opportunities, (b) negative and unfulfilling school experiences, and (c) severe home and welfare problems. These three factors interact with each other and, combined with gender and ethnicity influences, affect students' decisions to leave school early. Similarly, Thomson (2005) found that students most likely to succumb to low level, temporary employment opportunities, courses leading to limited opportunities for on-going education, training or employment, failed transitions and poor quality retention experiences are those who are already struggling to deal with disadvantage. Early studies found students least likely to succeed were disaffected by their experience of school and appeared to have less realistic aspirations than their not-at-risk peers (Gray & Hackling, 2009).

In California, an examination of graduation rates revealed that the high school students who did not graduate in four years included 21% of all students; 27% of Latino students; and 34% of African American students (The James Irvine Foundation, 2014).
(2010), however, is not steep enough to meet the federal accountability requirement. When current trends are overlayed with federal accountability targets, it becomes apparent that California will need to significantly ramp up its efforts to have any chance of reaching those targets.

California’s high schools face a major and difficult challenge: how to engage young people in the serious learning that can ensure lasting success in further education, career, and the civic life of our state. The magnitude and severity of the problems are well known; far too many students are dropping out of high school and many others earn a diploma without having mastered the knowledge and skill needed to succeed in postsecondary education and the world of work (Farr et al., 2009).

Adapting from the work of Hemmings, Hill, Jin, and Low (1998), this study examines the capacity for the school experience to impact on students' active participation and retention in the high school years. This is the one factor that education systems can influence. This study, subsequently, seeks to address the prevalent issue identified by the literature that continues to plague public high schools in this country. Specifically, this study will examine the impact of an intervention like Linked Learning and its potential ramifications on student achievement in public high school settings.

**Purpose Statement**

This study focuses on how the dynamics of the public high school culture may
influence students’ decisions to remain in school, participate in their education, and eventually experience success in school.

Contemporary perspectives on student engagement define it as students' involvement with activities and conditions likely to generate high quality learning outcomes. Martin (2006) argued that student motivation and engagement could be conceptualized as students' energy and drive to engage, learn, work effectively, and achieve to their potential at school and the behaviors that follow from this energy and drive.

The social and emotional context for learning is considered critical in optimizing student engagement with their learning. Fredericks, Blumenfeld, and Paris (2004) made this explicit: Engagement is associated with positive academic outcomes, including achievement and persistence in school; and it is higher in classrooms with supportive teachers and peers, challenging and authentic tasks, opportunities for choice, and sufficient structure.

In his study of early school leaving, Hodgson (2007), as quoted in Gray and Hackling (2009), found that cultures and structures in schools support relationships and experiences impacting on a student's decision to stay or go. This relationship with educators could be defined by the capacity (or not) to feel included, responded to, to have one's particular learning and educational needs understood and respectfully
responded to, and to have a say in one's educational experiences.

This study posits that school cultures hosting a Linked Learning initiative have an impact on three constructs: student engagement, school success, and student achievement. This work also asserts that establishing such a school culture is critical to school policies and practices intent on maximizing participation and retention of senior students. For the purposes of this paper, students' sense of wellbeing within their senior secondary school learning environment is related to the extent to which it satisfies their social, academic, and aspirational needs (Gray & Hackling, 2009).

**Significance of the Study**

Guha et al. (2012) concluded that students who struggle early in high school and fall behind in credit accumulation are more likely to drop out than those who stay on track academically. Accordingly, credit accumulation and numbers of courses failed are key indicators of progress toward on-time graduation. Guided by the work of Gray and Hackling (2009), the significance of this study is based on three premises.

1. That students' perceptions of the school culture and the extent to which it satisfies their social, academic, and aspirational needs are indicators of the wellbeing of senior school students.

2. That the level of engagement of senior school students influences the quality of their participation and retention.
3. That there are critical dimensions of a supportive school culture conducive to quality retention and participation.

Thus far, this work has examined how the traditional structure of high schools has not been able to narrow the achievement gap or reduce dropout rates. Furthermore, this work has highlighted how an intervention entitled Linked Learning has been deployed as a means of impacting the student achievement gap as well as reducing dropout rates. This study will lend to the literature on the role that Link Learning Pathways may play in remedying course equity and access issues in comprehensive high schools. Furthermore, the results of this work pose implications for examining the impact that Linking Learning Pathways may pose in the development of a school’s organizational culture inclusive of the sense of personalization to students (Cotton, 1996).

**Conceptual Framework**

This section describes the logic model on which the design of the study is based as well as the key constructs that will be investigated in this research. In its assessment of the impact of Linked Learning in California’s participating schools, SRI has conducted four evaluation reports. The most recent, Taking Stock of the California Linked Learning District Initiative: Fourth-Year Evaluation Report (Guha et al., 2014), presented findings on the student outcomes from most districts in the initiative. For each district in their study, the researchers examined indicators of pathway students’ engagement in school,
their progress toward high school graduation and college eligibility, and their gains in knowledge. The study found that compared with similar peers, students in certified pathways make significantly more progress toward graduation each year, as measured by credits accumulated and on-track completion of the a-g courses required for admission to California’s public four-year universities.

Adapting the evaluation design used by Guha et al. (2014), this study will utilize the logic model shown in Figure 1. While a conceptual framework like this can make no claim to be a comprehensive picture of all the influences that shape changes in the high schools in this study, it does include a range of key constructs that research has shown to play particularly important roles (Shear, Novais, Means, Gallagher, & Langworthy, 2010). Student engagement, school success, and student achievement are the main focus of investigation in this study. The model focuses on three overarching constructs and include student engagement, school success, and academic achievement.
Figure 1.0. Conceptual framework.

The key constructs are described in more detail in the subsequent paragraphs, which include the specific definitions that operationalize each of the constructs for the purposes of this research and the methods through which each of the constructs will be measured.

Student engagement involves positive student behaviors, such as attendance, paying attention, and participation in class, as well as the psychological experience of identification with school and feeling that one is cared for, respected, and part of the school environment. Engagement, furthermore, emerged as the critical variable in
dropout prevention efforts (Grannis, 1994). The construct of student engagement is supported by one of two variables that Guha et al. (2014) found relevant - student attendance.

With regard to school success, Anderson, Christenson, Sinclair, and Lehr (2004) suggested that the relationships students develop with teachers and peers are an important aspect of their motivation, achievement, and school behavior. The construct of school success is defined by two variables substantiated by the work of Guha et al. (2014), which are progress toward graduation and progress toward college eligibility. For this study, progress toward graduation was used as the variable undergirding school success.

In addressing academic achievement, Klem and Connell (2004) concluded that there is a strong relationship between school connectedness and educational outcomes inclusive of higher grades and classroom test scores. The construct of academic achievement is characterized by two variables validated by Guha et al. (2014), which are passing rates in the PSAT and proficiency rates in the CAHSEE.

This conceptual framework, undergirded by the constructs of student engagement, school success, and academic achievement, enables a coherent research approach supported by studies focusing on issues and programs that are relevant to the schools in this study.
Research Questions

This study examines the impact of Linked Learning's Pathways on the three variables outlined in the conceptual framework (a) student engagement; (b) school success; and (c) academic achievement of students in the three comprehensive high schools. Specifically, this study will be guided by the following research questions.

1. When compared to traditional high school models, what affect does Linked Learning have on student engagement?
   
   1.1 What is the difference in attendance rates between students in Linked Learning Pathways and students in non-Linked Learning Pathways?

2. When compared to traditional high school models, what affect does Linked Learning have on school success?

   2.1 What is the difference in progress toward high school graduation between students in Linked Learning Pathways and students in non-Linked Learning Pathways?

3. When compared to similar peers in traditional high school models, what affect does Linked Learning have on student academic achievement?
3.1 What is the difference in the percentage of students proficient or above in PSAT between students in Linked Learning Pathways and students in non-Linked Learning Pathways?

3.2 What is the difference in the percentage of students mastering English Language Arts and Mathematics content standards in CAHSEE between students in Linked Learning Pathways and students in non-Linked Learning Pathways?

Definitions

The following terms are pertinent to the study.

1. Linked Learning Pathways – an intervention program in high schools aimed at increasing student engagement, improving graduation rates, and increasing postsecondary opportunities for low-income and disadvantaged youth.

2. Student engagement – one measure used to assess student engagement: attendance.

3. School success – student successful completion of necessary coursework from one grade level to the next is used as a measure of progress toward high school graduation.

4. Academic achievement – two sets of standardized tests are used to measure
academic achievement: student passing rates in the PSAT and passing rates in ELA and math in the CAHSEE.

5. Attendance rates – extent to which the student attends school.

6. Progress toward graduation – extent to which students in pathways accumulate credits in each grade level for successful progression through high school.

7. PSAT rates – student passing rates in composite PSAT scores.

8. CAHSEE passing rates – mastery of English Language Arts and math standards assessed by the CAHSEE scores.
CHAPTER 2
LITERATURE REVIEW

Introduction

Zanibbi, Munby, Hutchinson, Versnel, and Chin (2006) pointed out that themes emerging from the literature on exemplary Work-Based Education (WBE) Programs were generally consistent, had strong communication among partners, linked school learning with workplace learning through the creation of pathways between the school and the workplace, and had effective and meaningful student-teacher relationships. Murray and Greenberg (2001) found that active involvement, open communication, responsiveness, and warmth between teachers and students played an important role in determining the quality of these relationships.

Murray and Malmgren (2005) found that there were a number of barriers that could inhibit positive teacher–student relationships in high-poverty urban schools. Some of those barriers stem from broader needs within large, under-funded school districts that serve high numbers of students from lower socioeconomic backgrounds. For example, many urban schools suffer from a lack of sufficient resources and/or a mismanagement of resources, which can negatively impact the number of teacher vacancies, opportunities for teacher professional development, and availability of time for establishing and maintaining supportive teacher–student relationships. Many schools in such
environments have shortages of teachers, employ teachers who were not qualified to teach the subject area(s) they were assigned to teach, and have high teacher turnover rates.

**Student Engagement**

Gray and Hackling (2009) identified a growing body of research on school retention and sought institutional, socio-economic, and personal factors that might impact the completion of 12 years of schooling. Many of these studies, according to the researchers, identified students most at risk of leaving school without certification or adequate educational or training requirements for on-going employment.

In a school-based investigation of adult–student relationships, Anderson et al. (2004) examined how increased interaction between adults and students impacted student attendance and teacher-rated engagement. In this study, adult monitors met with students for approximately 20 months during the transition into secondary schools in a process called Check and Connect. These monitors checked on students by conducting ongoing evaluations of students’ progress in school and also made efforts to connect with students, their families, and their teachers in efforts characterized by persistent high expectations and positive support of students. Although this investigation did not utilize a control group, findings indicated that student–monitor relationship quality was a
predictor of attendance and academic engagement in school after controlling for baseline student risk status, tardies, and absences (Murray & Malmgren, 2005).

Gray and Hackling (2009) argued that the question of how to improve retention and participation rates for secondary students as well as how to improve the quality of the retention experience itself becomes paramount. Legislation alone, the researchers insisted, will not persuade students to remain at school. Although there has been a recent shift in conceptualization of retention to embrace school-to-work and school-to-training transitions, the challenge remains in providing a positive, purposeful, and productive experience for students that helps them attain the self-esteem, qualifications, and experiences needed to reach their goals.

Concern related to increasing the length of time students remain at school is a global issue. A recent report into school retention (White, 2003) found that compared with young people who complete secondary schooling, those who do not finish secondary schooling are more likely to experience extended periods of unemployment, obtain low-paid and low-skilled jobs, and have difficulty obtaining relatively stable jobs. They are more likely to earn less, rely on government assistance, and not actively participate in community life (White, 2003).

Anderson et al. (2004) reported on the positive impact of an intervention model designed to promote student engagement with school through relationship building,
problem solving, and persistence called Check and Connect. The results of this study indicated that after accounting for baseline attendance, and the other cumulative student risk factors that increase the likelihood for school failure, student perceptions of the closeness and quality of their relationship were associated with improved engagement in terms of student attendance and monitors’ perspectives of their relationships with students were a significant predictor of teacher ratings of academic engagement. In general, students with higher risk did not have significantly poorer relationships with their monitors or less favorable engagement at school and with learning.

**School Success**

Lamb, Walstab, Teese, Vickers, and Rumberger (2004) found that within Australia, the secondary school completion rate was 30% of students dropping out of school before completing 12 years of schooling. Variations in retention data across the Australian states are influenced by factors such as the proportion of Indigenous students, the remoteness of secondary schools from key metropolitan education districts, access to post compulsory education within the local school, and access to technical and further education colleges and workplace learning opportunities.

**Academic Achievement**

In their evaluation of the demonstration sites in the ConnectEd Network, Farr et al. (2009) found that the results on student achievement outcomes for those participating
in the programs indicated positive effects of the program on a number of indicators of student learning for the Network as a whole and for particular sites or subject areas. The researchers caution that it is not easy to demonstrate positive effects on achievement—particularly at the high school level—so these results should not be taken lightly. In addition, while these programs vary significantly in format and structure and in size and industry sector with which they are aligned, the students and teachers in the programs consistently report strong positive outcomes for students in terms of learning, attitudes, and behaviors and strong positive outcomes for teachers and administrators in their experiences with collaboration on curriculum and instruction and in their feelings of professionalism and efficacy (Farr et al., 2009).

Furlong et al. (2003) profiled the benefits of students affiliating with a positive peer group. Students' health and educational outcomes are influenced by the characteristics of their peers, such as whether the peer group supports pro-social behavior (e.g., engaging in school activities, completing homework assignments, and helping others). Being part of a stable peer network protects students from being victimized or bullied (Pellegrini & Bartini, 2000, as cited in Blum & Carr, 2010). However, if the norms in the peer group support socially irresponsible behavior (e.g., bullying, graffiti), students are less likely to be involved in school activities and their sense of
connectedness to school, achievement levels, and health behaviors can suffer (Blum & Carr, 2010).

A positive school environment, often called school climate, is characterized by caring and supportive interpersonal relationships; opportunities to participate in school activities and decision-making; and shared positive norms, goals, and values. One study found that schools with a higher average sense-of-community score (i.e., composite of students' perception of caring and supportive interpersonal relationships and their ability to be autonomous and have influence in the classroom) had significantly lower average student drug use and delinquency. In addition, schools that have higher rates of participation in extracurricular activities during or after school tend to have higher levels of school connectedness (Wilson, 2004).

**Related Literature**

**Workforce Transition**

In a study examining the impact of pathways in Denmark and Australia, Murray and Polesel (2013) found that in the area of education and training, different configurations of government with various institutional structures may produce similar or quite different educational and employment outcomes. Other factors come into play in assessing outcomes. For example, young people’s transitions from education to work are shaped by a variety of structural and institutional relations in education and the labor
market. Bosch and Charest (2008) argued that such developments in approaches to education and training are challenging to understand without including these perspectives.

According to Farr et al. (2009), schools seek to offer a variety of work-based learning opportunities (internships, job shadowing, mentoring), but the availability of these is spotty. School staff agree that work-based learning is valuable for many reasons, but that it is difficult to find the time and resources to build relationships with industry partners. Other challenges to implementing work-based learning include some students’ need to maintain jobs, matching student interests with learning opportunities, and ensuring that these opportunities provide meaningful experience and training. Lea, Tootell, Wolgemuth, Halkon, and Douglas (2008) recommended that schools team up with universities, cultural institutions, businesses, and community organizations to provide students with experiences that will help them develop career goals.

Brooks (2009) argued that the concept of transition from education to employment itself needs to be re-evaluated, as it can suggest a linear progression involving adult learning, when, in fact, young people’s movement from education to work is both complex and irregular. Young people’s transitions from education to work are shaped by different structures and relations in education and the labor market, but are also shaped by social welfare systems as well as the role of government agendas in
economic development. Simmonds (2009, as cited in Murray & Polesel, 2013) suggested on the basis of the United Kingdom experience that a major constraint on improving adaptability is the ability - or lack thereof - of the state to adequately reform the delivery of training, welfare systems, and employability programs to meet new challenges.

With support from state and federal policymakers as well as support from an array of technical assistance organizations, like ConnectEd, the Linked Learning movement is likely to continue to gain momentum in communities and schools across the state as it aims to change the learning experiences and life opportunities for youth. In districts with Linked Learning pathways, career themes vary across districts as they reflect local industry. Examples of career themes include engineering, environmental sciences, medicine, law, performing arts, agriculture, and teaching. While many high schools have only one or two career-themed pathways available to students, some districts, like Pasadena and West Contra Costa, have high schools that are wall-to-wall pathways, meaning that each student who matriculates to that school must enroll in a Linked Learning pathway. As the Linked Learning movement takes hold in California districts, some districts, such as Los Angeles Unified School District, are experimenting with extending the Linked Learning approach into middle school to ensure entering students are well-prepared (Jaquith et al., 2014).
Pecheone, Kahl, Hamma, and Jaquith (2010) maintained that a critical aspect of changing students’ learning experiences, and thereby altering students’ life opportunities, is providing all students with meaningful learning experiences. One sort of meaningful school learning experience connects workplace-relevant knowledge and skills to the classroom setting. The curriculum must challenge students and make new concepts and skills accessible. Importantly, meaningful learning also engages the learner in assessment experiences that provide opportunities for students to show what they know and can do, and it uses assessment experiences to provide feedback to students on their performance so that students can and do improve. Feedback is necessary for continuous learning.

Therefore, an important lever for improving teaching and learning in all schools, including Linked Learning pathways, is the development of a performance assessment system. California requires high school students who aspire to attend one of the state’s four-year public universities to complete a rigorous academic program, generally known as the UC/CSU a-g requirements (Guha et al., 2012).

Integrating these components in a clear and manageable system that aligns curriculum, instruction, and assessment is intended to support and guide students to become college and career-ready and to provide evidence of student proficiency in pathway outcomes. Developing Linked Learning pathways that are truly grounded in work-based learning, meet college readiness requirements for admission to the University
of California system, prepare students with twenty-first century career skills—like knowing how to work effectively in teams—and engage students in meaningful projects and worthwhile performance assessments during the course of a student’s high school career is an ambitious and complex undertaking (Jaquith et al., 2014).

**Theoretical Framework**

The theoretical framework undergirding this study is supported by the constructs that comprise the school culture.

Voelkl (1997) has examined two key concepts underpinning the establishment and fostering of participation and retention: student identification with school through a sense of belonging and valuing of school and related outcomes as well as trust relationships within the school. Fraser (2007) examined the effect of student perceptions of their learning environment, and especially their teachers, on achievement and learning. Although this growing body of research is shaping an understanding of the influence of the learning environment on students who leave school before completion, very few studies focus on understanding the perspectives and learning needs of those students who choose to complete their final two years of schooling (Gray & Hackling, 2009).

In addressing the research questions posed by this study, the researcher hopes to capture the impact that Linked Learning has on the constructs of student engagement, school success, and academic achievement. The theoretical framework provides
descriptive information regarding program variables characterizing the Linked Learning sites. It also presents a discussion of results from Linked Learning implementation factors to student outcomes and explicates key factors that seemed to affect implementation. These factors will be identified through a comprehensive analysis of the student quantitative data.

An assumption embedded in the theoretical framework was the research questions and methodology needed to be informed by student data rather than a particular Linked Learning program. The literature that contributed to the overall design of this study included leading studies and research on specific constructs related to school culture that were associated with positive student outcomes.

**Summary**

Murray and Polesel (2013) recounted that over the last five years, developed nations have faced high levels of youth unemployment. The average across the OECD nations has risen from 12.8% in 2007 to 17.1% in 2012 (Citation here). The role of transition systems defined as the relatively enduring features of a country’s institutional and structural arrangements which shape young people’s transitions according to Iannelli and Raffe (2007) is crucial in the creation of effective pathways for young people to higher education, post-school, or to work-based training, such as apprenticeships and opportunities directly into the labor market. These patterns vary to a considerable degree
by country with some nations experiencing youth unemployment rates of over 50% (Murray & Polesel, 2013).

Adolescents living in high-poverty urban environments are faced with numerous obstacles. Research investigations have documented many of these challenges, which included high rates of violence, increased levels of stress, poor-quality schools, dangerous neighborhoods, high rates of drug and alcohol addiction, limited opportunities for meaningful employment, and poor-quality health care (Citation here). Exposure to these and the many other stressful conditions present in many high-poverty urban settings can have sustained, negative effects on the health and wellbeing of individuals living in such settings. Youth with emotional and behavioral problems who live in poverty are faced with even greater challenges because these individuals are at an even greater risk of experiencing poor adjustment and poor long-term outcomes (Murray & Malmgren, 2005).
CHAPTER 3

METHODOLOGY

Introduction and Purpose of the Study

This section presents the approaches to the methodology that comprise this study. The purpose of this study is to investigate the impact of Linked Learning Pathways in three high schools in an urban school district setting. Specifically, this study will analyze the impact that Linked Learning Pathways has on three constructs: student engagement, school success, and student achievement as defined in the conceptual framework section in Chapter 1.

In their evaluation study of Linked Learning sites, Farr et al. (2009) found that the initiative offers participating students full access to a range of pathway options with expectations that improved academic performance and high school graduation and college attendance rates will result. Further, the initiative serves as a vehicle for the foundation and its various partners to develop and refine the Linked Learning approach, to determine what makes Linked Learning successful at a systemic level, and to demonstrate the viability of Linked Learning as a comprehensive approach to high school reform.

Guided by the Farr et al. (2009) methodology, this study sought to learn what features deemed critical to the effective implementation of multiple pathways were
evident in the high school sites and the extent to which multiple pathways impacted the three constructs (student engagement, school success, and academic achievement) than those achieved by more traditional high schools. The results of this study were used to identify areas of strength and weakness for the sites under study and, thereby, identify targets for recommendations. These recommendations may aid in such areas as needs assessment, strategic planning, program and curriculum development, professional development, assessment, and accountability and evaluation in the Linked Learning sites.

**Research Design**

This study will use quantitative analysis to understand the impact of Linked Learning practices on student outcomes. In terms of research design, this study will employ a quantitative methodology that will be sequential, with the three constructs used to help explain findings. Throughout all stages of analyses, this research design will be attuned in terms of rigor and integrity.

Quantitative student data will be collected to establish relationships and patterns of connectedness among and between the three constructs. These student data will include, but not be limited to, attendance rates, retention rates, course credits accumulated, the extent to which students in pathways complete coursework toward college eligibility, PSAT passing rates, and CAHSEE passing rates.
The congruence between the research questions and the actual impact on the three constructs will be kept at the forefront of this study. This research design is guided by the work of Gray and Hackling (2009) who employed a similar design in their investigation of secondary student retention.

**Research Questions**

This study will examine the impact of Linked Learning's Pathways on the academic achievement of students in three comprehensive high schools. Specifically, this study will be guided by the following research questions.

1. When compared to traditional high school models, what affect does Linked Learning have on student engagement?
   1.1 What is the difference in attendance rates between students in Linked Learning Pathways and students in non-Linked Learning Pathways?

2. When compared to traditional high school models, what affect does Linked Learning have on school success?
   2.1 What is the difference in progress toward high school graduation between students in Linked Learning Pathways and students in non-Linked Learning Pathways?
3. When compared to similar peers in traditional high school models, what affect does Linked Learning have on student academic achievement?

3.1 What is the difference in the percentage of students proficient or above in PSAT between students in Linked Learning Pathways and students in non-Linked Learning Pathways?

3.2 What is the difference in the percentage of students mastering Mathematics content standards in CAHSEE between students in Linked Learning Pathways and students in non-Linked Learning Pathways?

Participants

This section lays out the sampling guidelines of participants that make up this study. Three high schools in an urban school district in the East Bay in northern California were selected for this study because of their history of sustained implementation of the Linked Learning initiative and the student diversity that comprise these sites. The three high schools are in the same district and draw from the student population in the middle schools that are part of the feeder pattern. Table 1 outlines the student demographics for the three high schools as well as the district in this study (California Department of Education, 2014).
### Table 1

*Student Ethnic Breakdown*

<table>
<thead>
<tr>
<th>School</th>
<th>Enrollment</th>
<th>W</th>
<th>AA</th>
<th>Latino</th>
<th>Asian</th>
<th>LSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1,124</td>
<td>11%</td>
<td>25%</td>
<td>44%</td>
<td>12%</td>
<td>71%</td>
</tr>
<tr>
<td>B</td>
<td>1,341</td>
<td>19%</td>
<td>30%</td>
<td>28%</td>
<td>19%</td>
<td>53%</td>
</tr>
<tr>
<td>C</td>
<td>1,491</td>
<td>2%</td>
<td>6%</td>
<td>85%</td>
<td>4%</td>
<td>89%</td>
</tr>
<tr>
<td>District</td>
<td>30,720</td>
<td>11%</td>
<td>19%</td>
<td>52%</td>
<td>10%</td>
<td>71%</td>
</tr>
</tbody>
</table>

All students from Linked Learning pathways in the three high schools will be selected for analysis in this study. Additionally, all non-pathway students will also be selected for comparative analyses. This data set will ensure an accurate representation of the student participants inclusive of ethnicity, gender, and free or reduced-price lunch status.

**Setting**

This section describes the setting of the study in an urban school district in California’s East San Francisco Bay area. The school district is made up of an ethnic student profile of 52% Latino, 19% African American, 11% White, 10% Asian, and 8% Other ([Citation here](#)). English Language Learners comprise over 35% of the student
population. District-wide, 71% of the students are eligible for free or reduced-price lunch.

During the 2014-2015 school year, the total student enrollment for the district was 30,720. Over 1,511 teachers comprise the teaching force in the district assigned among 36 elementary schools, six middle schools, and seven high schools (Citation here).

**Instrumentation**

One important function of this study is to assess the quality of the instrumentation. The primary instrument for this study utilizes the district’s student information system, Power School. This approach focuses on the data source that features most strongly in quantitative analysis. Although a number of databases outside the instrument may also be utilized in the retrieval of student information, the researcher predicts that the range of data and scores derived from these instruments will be reliable.

**Procedures/Data Collection**

The researcher will collect student achievement data from the district’s student information system, Power School, from student databases hosting student attendance information, and from the California Department of Education website. These data sources represent important measures.

The goal of the data collection is to compare progress of students in pathways with non-pathway students in the same high schools to discern the answers to the research questions. The specific analyses to be undertaken are based on the availability of
three-year longitudinal data sources. The achievement data will be used to inform local analysis within the district only.

Data collection for this study will be conducted between January and March 2015. Quantitative analysis will be used to compare short- and long-term pathway student outcomes in the three high schools in the same district. The researcher will compile rosters for each school and identify the Linked Learning Pathways comprising each school.

To answer the first set of research questions, the researcher will analyze student attendance data from two district databases. The procedure will be duplicated for each comparison site. To answer the second set of research questions, the researcher will examine the accumulation of credits required for promotion from one grade level to another in a given year for three consecutive years in each of the high schools in the study. To answer the third set of research questions, the researcher will analyze aggregated data on passing rates for PSAT and CAHSEE. Outcomes assessed will include the percent of pathway and non-pathway students who passed the California High School Exit Exam (CAHSEE) and passing scores on the PSAT.

To conduct the student outcomes analysis, the researcher will examine data for the class of 2015 (students who began high school in 2011-2012). These data allow the
researcher to provide a detailed picture of the demographic characteristics and prior achievement levels of pathway students compared with non-pathway students.

**Data Analysis**

Once the data sets have been retrieved, sorted, and classified for each of the three research questions, the researcher will employ a two-phase data analysis process.

Phase 1 will involve descriptive statistics to analyze the data to classify, describe, and summarize, in a meaningful way, patterns that will emerge from the data. The data analyses in this phase will not, however, allow the researcher to make conclusions beyond the data that will be analyzed. This phase will simply describe the data. This preliminary phase is important because it will allow the researcher to present raw data in a way that can synthesize what the data are showing. Descriptive statistics enables the presentation of data in a more meaningful way allowing for simpler interpretation.

Phase 2 of the data analysis will include inferential statistics as a technique that allows for the use of data sets to make generalizations about the populations from which the samples were drawn. It is important that the student data sets accurately represent the student population in the three high schools in the study. This phase will allow the researcher to explore some associations between the Linked Learning Pathways and the three constructs undergirding this study. It is important to note that no correlational or cause-and-effect will be inferred from either of the two data analysis phases.
The researcher will conduct three types of comparative analyses. The data will first be presented comparing attendance rates of pathway students with non-pathway students in each of three sites. The disaggregation of the data is important for learning how the performance of pathway students compared with the performance of students in non-pathway programs.

Secondly, for each construct, the researcher will also present the data disaggregated by the three individual sites. The overall analysis will make transparent any differences among sites that may be important to highlight. Through discussions about the data with each site, the researcher will be able to clarify the differences in student performance and some potential reasons for them. These observations will be integrated in the discussion of results.

Finally, the researcher will present site-to-site comparison analyses. The differences between pathway and non-pathway student results on each of the constructs will be presented as individual tables and synthesized in the findings of this study.

**Limitations of the Study**

Limitations are inherent in any data collection and analysis technique. As with any descriptive statistics research, limitations exist when using archival student data. Four limitations of this study should be noted.
First, as mentioned previously, while it is important that the student data sets accurately represent the student population, it is worthy to reiterate that student mobility plays a role in the results of this study. Caution is heeded, therefore, in making generalizations about the findings in this study.

Secondly, another limitation in this study is the use of descriptive data minimizes the allowance to infer causal relationships among the constructs in this work. While this limitation does not necessarily undermine the validity of the findings caution again is heeded in generalizing the findings of this work.

Thirdly, the findings will be based on data sets of a student population in the context of a high school reform initiative – Linked Learning – in an urban school district. The generalizability of the findings to students in other high schools, or in the context of other high school reform models, still needs to be further investigated.

The fourth limitation is related to the paucity of research on this specific type of school reform initiative in high schools. While high school reform studies are plentiful in the literature, specific secondary school reform addressing pathways and their impact on student achievement is scarce.

**Subject-Positioning**

Employing a quantitative approach to discerning the answers to the research questions, the researcher takes the position that this form of study will allow for the
various forms of longitudinal student data including attendance, progress toward graduation rates, PSAT measures, and CAHSEE passing rates to triangulate ensuring validity of measures.
CHAPTER 4
RESULTS/OUTCOMES

Introduction

This study was designed based on three sets of research questions. The results of the data analysis are presented in this chapter. This chapter was developed to describe the procedures undertaken in responding to the research questions. The findings are reported in three sections coinciding with the three constructs that define the conceptual framework for this study: findings of the first primary research question addressing the affect of Linked Learning on student engagement; findings of the second primary research question investigating the affect of Linked Learning on school success; and, findings of the third primary research question examining the affect of Linked Learning on student academic achievement. Each of the research questions is restated and is proceeded by the results for each of the questions. The findings are described under question and are supplemented with tables supporting the results. A synthesis of the major findings is provided in the last section of this chapter.

From a theoretical perspective, this study focused on how the dynamics of the public high school culture may influence students’ decisions to remain in school, participate in their education, and eventually experience success in school. Additionally,
this study examined the capacity for the school experience to impact on students' active participation and retention in the high school years. Explicitly, this study assessed the impact of an intervention called Linked Learning and its potential ramifications on student achievement in public high school settings.

This work examined the impact of Linked Learning's Pathways on the three variables outlined in the conceptual framework (a) student engagement; (b) school success; and (c) academic achievement of students in three comprehensive high schools in an urban school district in the California Bay Area. Specifically, this study was guided by the following three sets of research questions.

**Research Questions**

1. When compared to traditional high school models, what affect does Linked Learning have on student engagement?

   1.1 What is the difference in attendance rates between students in Linked Learning Pathways and students in non-Linked Learning Pathways?

2. When compared to traditional high school models, what affect does Linked Learning have on school success?
2.2 What is the difference in progress toward high school graduation between students in Linked Learning Pathways and students in non-Linked Learning Pathways?

3. When compared to similar peers in traditional high school models, what affect does Linked Learning have on student academic achievement?

3.3 What is the difference in the percentage of students proficient or above in PSAT between students in Linked Learning Pathways and students in non-Linked Learning Pathways?

3.4 What is the difference in the percentage of students mastering Mathematics content standards in CAHSEE between students in Linked Learning Pathways and students in non-Linked Learning Pathways?

The section that follows explains the overall organization and aggregation of student data that were used to address each of the aforementioned research questions.

**Analysis Methodology**

This study used quantitative analysis to understand the impact of Linked Learning practices on student outcomes. Additionally, this study employed a quantitative methodology with the three constructs used to help explain findings. Throughout all stages of analyses, this research design was attuned in terms of rigor and integrity.
Three high schools in an urban school district in the East Bay in northern California were selected for this study because of their history of sustained implementation of the Linked Learning initiative and the student diversity that comprise these sites. The three high schools are in the same district and draw from the student population in the middle schools that are part of feeder patterns. Table 1 (see Chapter 1) outlines the student demographic profile for the three high schools as well as the district in this study.

All of the students from Linked Learning pathways in each of the three high schools were selected for analysis in this study as opposed to retrieving a representative sample. This decision was based on the ease of manageability of the analyses given the number of students in this study. Additionally, rosters of non-pathway students were selected for comparative analyses. These data sets ensured a comprehensive representation of the student participants inclusive of ethnicity, gender, and free or reduced-price lunch status. At no time during the data retrieval process were student names included in the analyses ensuring complete confidentiality of the subjects in this study.

One important function of this study was to assess the quality of the instrumentation. The primary instrument for this study utilizes the district’s student information system, Power School. This approach focused on the data sources that
feature most strongly in quantitative analysis. Although a number of databases outside
the instrument were utilized in the retrieval of student information, the researcher ensured
that the range of data and scores derived from these instruments were reliable.

The next section highlights the presentation of the results of the data analysis
supported by tables to explicate the findings for each of the research questions. The
vertical configurations for the tables merit elaboration. The comparison groups are
denoted by P (Pathway Students) and NP (Non-Pathway Students). Additionally, the
tables are categorized by Year 1 (2011-12); Year 2 (2012-13); and Year 3 (2013-14)
reflecting the longitudinal nature of this study.

Presentation of Results

Quantitative student data were collected and analyzed to establish relationships
and patterns of connectedness among and between the three constructs in this study.
These student data sets included, but were not be limited to, attendance rates, course
credit accumulation, PSAT passing rates, and CAHSEE passing rates.

The congruence between the research questions and the actual impact on the three
constructs were kept at the forefront of this study. This research design was guided by the
work of Gray and Hackling (2009) who employed a similar design in their investigation
of secondary student retention.
Student engagement, school success, and student achievement were the main foci of investigation in this study. Adapting the evaluation design used by Guha et al. (2014), this study utilized the logic model shown in Figure 1 (see Chapter 1). It merits to reiterate that while a conceptual framework like this can make no claim to be a comprehensive picture of all the influences that shape changes in the high schools in this study, it does highlight a range of key constructs that research has shown to play particularly important roles (Shear et al., 2010).

The results of the study are outlined in the remainder of this section through the reiteration of the three sets of research questions supported by tables reflecting frequency distributions.

The first set of research questions addressed by this study included

1. When compared to traditional high school models, what affect does Linked Learning have on student engagement?
   1.1 What is the difference in attendance rates between students in Linked Learning Pathways and students in non-Linked Learning Pathways?

To answer the first set of research questions, the researcher analyzed student attendance data rates from two district databases. The procedure was duplicated for each
of the comparison groups in each of the three high schools in the study. Table 2 reflects the attendance rates.

Table 2

*Attendance Rates*

<table>
<thead>
<tr>
<th>Site</th>
<th>Year 1 (2011-12)</th>
<th>Year 2 (2012-13)</th>
<th>Year 3 (2013-14)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P</td>
<td>NP</td>
<td>P</td>
</tr>
<tr>
<td>School A</td>
<td>N</td>
<td>253</td>
<td>361</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>95%</td>
<td>93%</td>
</tr>
<tr>
<td>School B</td>
<td>N</td>
<td>171</td>
<td>751</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>97%</td>
<td>94%</td>
</tr>
<tr>
<td>School C</td>
<td>N</td>
<td>686</td>
<td>419</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>94%</td>
<td>93%</td>
</tr>
</tbody>
</table>

A vertical analysis comparing attendance rates between pathway students and non-pathway students in each of the three high schools indicated that overall pathway students reflected higher attendance rates than their non-pathway peers. In all of the three years of the study and in all of the three high schools, pathway students reflected higher attendance rates than their non-pathway peers. A horizontal analysis reflects that these higher attendance rates of pathway students were sustained throughout the three years.
even when the number of pathway students increased from one year to the next. The highest attendance rates across the three years were reflected in School B while the lowest attendance rates were found in School C.

The second set of research questions addressed by this study included

2. When compared to traditional high school models, what affect does Linked Learning have on school success?

2.1 What is the difference in progress toward high school graduation between students in Linked Learning Pathways and students in non-Linked Learning Pathways?

To answer the second set of research questions, this study examined promotion rates via the accumulation of credits required for promotion from grade level to another in a given year for three consecutive years in each of the high schools in the study. District policy for each of the high schools considers students making progress toward graduation through the accumulation of credits that reflects the following configurations

- to enter tenth grade a minimum of 55 credits required;
- to enter eleventh grade a minimum of 110 credits required; and,
- to enter twelfth grade a minimum of 165 credits required.

Table 3 reflects the progress toward graduation rates for the three high schools in this study.
Table 3

Progress Toward Graduation

<table>
<thead>
<tr>
<th>Site</th>
<th>Year 1 (9th Grade) (2011-12)</th>
<th>Year 2 (10th Grade) (2012-13)</th>
<th>Year 3 (11th Grade) (2013-14)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P</td>
<td>NP</td>
<td>P</td>
</tr>
<tr>
<td>School A</td>
<td>N</td>
<td>253</td>
<td>357</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>20%</td>
<td>64%</td>
</tr>
<tr>
<td>School B</td>
<td>N</td>
<td>0</td>
<td>228</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>0%</td>
<td>74%</td>
</tr>
<tr>
<td>School C</td>
<td>N</td>
<td>1</td>
<td>351</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>0%</td>
<td>64%</td>
</tr>
</tbody>
</table>

It is important to note that in analyzing the data sets for this construct, without consideration to student mobility, this configuration theoretically follows a student cohort from grade nine in 2011-12 to grade eleven in 2013-14. As reflected in Table 3, students in non-pathways accumulated more credits by the end of the ninth grade compared with their pathway peers in their respective high schools. This effect may be attributed to the students’ initial acclimation to the Linked Learning Program in each of the high schools. In year two, the progress toward graduation appears to equalize for the pathway and non-
pathway students. The percentage of pathway students accruing the necessary number of credits to be on target in year two equaled or exceeded their non-pathway peers.

By year three (eleventh grade), the percent of pathway students making progress toward graduation exceeds their non-pathway peers in two of the three high schools. Overall, School C reflects the site with pathway students making the most progress toward graduation.

The third set of research questions addressed by this study included

3. When compared to similar peers in traditional high school models, what affect does Linked Learning have on student academic achievement?

3.3 What is the difference in the percentage of students proficient or above in PSAT between students in Linked Learning Pathways and students in non-Linked Learning Pathways?

3.4 What is the difference in the percentage of students mastering English Language Arts and Mathematics content standards in CAHSEE between students in Linked Learning Pathways and students in non-Linked Learning Pathways?

To answer the third set of research questions, the study analyzed aggregated data on passing rates for PSAT and CAHSEE. Outcomes assessed included the percent of pathway and non-pathway students who passed the California High School Exit Exam
(CAHSEE) and passing scores on the PSAT. Table 4 highlights the passing rates of pathway versus non-pathway students in the PSAT.

Table 4

**PSAT Passing Rates**

<table>
<thead>
<tr>
<th>Site</th>
<th>Year 1 (2011-12)</th>
<th>Year 2 (2012-13)</th>
<th>Year 3 (2013-14)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P</td>
<td>NP</td>
<td>P</td>
</tr>
<tr>
<td>School A</td>
<td>N</td>
<td>231</td>
<td>92</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>7%</td>
<td>12%</td>
</tr>
<tr>
<td>School B</td>
<td>N</td>
<td>153</td>
<td>381</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>22%</td>
<td>21%</td>
</tr>
<tr>
<td>School C</td>
<td>N</td>
<td>588</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>3%</td>
<td>2%</td>
</tr>
</tbody>
</table>

Table 4 reflects that in the three years of this study, overall pathway students had higher PSAT passing rates in two of the three high schools. The lowest PSAT passing rates for pathway students appears to be in School C with the highest passing rates residing in School B.
Table 5

CAHSEE Passing Rates English Language Arts

<table>
<thead>
<tr>
<th>Site</th>
<th>Year 1 (2011-12)</th>
<th>Year 2 (2012-13)</th>
<th>Year 3 (2013-14)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P</td>
<td>NP</td>
<td>P</td>
</tr>
<tr>
<td>School A</td>
<td>N</td>
<td>242</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>79%</td>
<td>59%</td>
</tr>
<tr>
<td>School B</td>
<td>N</td>
<td>168</td>
<td>387</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>86%</td>
<td>82%</td>
</tr>
<tr>
<td>School C</td>
<td>N</td>
<td>666</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>69%</td>
<td>61%</td>
</tr>
</tbody>
</table>

It is worth noting that students enrolled in pathways in the three sites reflected higher percentages in passing the ELA CAHSEE than their non-pathway students for all three years in the study. For year one, School B reflected the highest ELA CAHSEE passing rate at 86% for pathway students when compared to 82% for their non-pathway peers. Similar patterns were evident for year two. Eighty-one percent of pathway students passed the exam in both Schools A and B compared with 27 and 78% of non-pathway students, respectively. For year three, passing rates for pathway students were 80, 87, and 62% in Schools A, B, and C compared with 16, 75, and 37% for their counterparts in the
three schools, respectively. The highest passing rates for the pathway students were found in School B with the lowest passing rates clustered in School C.

Table 6

**CAHSEE Passing Rates Mathematics**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>School A</td>
<td>N 242</td>
<td>91</td>
<td>384</td>
<td>28</td>
<td>467</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>% 76%</td>
<td>64%</td>
<td>80%</td>
<td>32%</td>
<td>79%</td>
<td>38%</td>
</tr>
<tr>
<td>School B</td>
<td>N 168</td>
<td>380</td>
<td>209</td>
<td>366</td>
<td>177</td>
<td>413</td>
</tr>
<tr>
<td></td>
<td>% 79%</td>
<td>78%</td>
<td>78%</td>
<td>76%</td>
<td>84%</td>
<td>78%</td>
</tr>
<tr>
<td>School C</td>
<td>N 659</td>
<td>43</td>
<td>709</td>
<td>4</td>
<td>626</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>% 67%</td>
<td>61%</td>
<td>54%</td>
<td>0%</td>
<td>63%</td>
<td>49%</td>
</tr>
</tbody>
</table>

Similar patterns were evident for the CAHSEE Math assessment. In this set of analyses, the disaggregated results indicated that pathway students were more likely than the non-pathway students to pass the CAHSEE Math. The passing rates for pathway students in year one surpassed those of their non-pathway peers in all three high schools. A parallel trend appears to hold for years two and three for pathway students reflecting higher passing rates in the three high schools when compared to their non-pathway peers.
The highest passing rates for pathway students were clustered in Schools A and B while School C reflected the lowest passing rates for pathway students.

**Summary of the Findings**

While not consistently positive across all variables and all three years, these analyses resulted in some positive and interesting findings. However, the calculations of percentages for the pathway students and the comparisons to their non-pathway peers as a whole provided a limited view. Clearly further in-depth analyses are in order to specifically examine the impact of Linked Learning on student ethnicity, LSES, and gender.

Adapting from the work of Hemmings et al. (1998), this study examined the capacity for the school experience to impact on students’ engagement, school success, and academic achievement in the high school years. This study further sought to address the prevalent issue identified by the literature that continues to plague public high schools in this country: the issue of the lack of effective, sustainable high school reform models.
CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Introduction

Adapting the evaluation design used by Guha et al. (2014), this study utilized a logic model (see Figure 1) for a conceptual framework that makes no claim to be a comprehensive picture of all the influences that shape changes in the high schools in this study. The framework does, however, include a range of key constructs that research has shown to play particularly important roles (Shear et al., 2010). The model focuses on three overarching constructs that include student engagement, school success, and academic achievement. The constructs undergirding the conceptual framework enabled a coherent quantitative research approach supported by research focusing on issues and programs that are relevant to the schools in this study.

This study examined the impact of Linked Learning's Pathways on the three constructs outlined in the conceptual framework in three comprehensive high schools in an urban school district in the California Bay Area. Specifically, this study was guided by the following research questions.

Research Questions

1. When compared to traditional high school models, what affect does Linked Learning have on student engagement?
1.1 What is the difference in attendance rates between students in Linked Learning Pathways and students in non-Linked Learning Pathways?

2. When compared to traditional high school models, what affect does Linked Learning have on school success?

2.1 What is the difference in progress toward high school graduation between students in Linked Learning Pathways and students in non-Linked Learning Pathways?

3. When compared to similar peers in traditional high school models, what affect does Linked Learning have on student academic achievement?

3.1 What is the difference in the percentage of students proficient or above in PSAT between students in Linked Learning Pathways and students in non-Linked Learning Pathways?

3.2 What is the difference in the percentage of students mastering Mathematics content standards in CAHSEE between students in Linked Learning Pathways and students in non-Linked Learning Pathways?
Interpretation of Findings

Guha et al. (2012) concluded that pathways are designed to engage students who do not initially view high school as valuable or directly relevant for their future success, in addition to deepening the educational experiences of those who do. The researcher further asserted that small cohorts and student supports in the pathways are designed to help students feel more connected to their school community.

In addition to three constructs in this study, key elements suggest that students in pathways are making more progress than their non-pathway peers. This section now turns to how these experiences resulted in improved outcomes for Linked Learning students compared with their non-pathways peers in this study.

To assess student engagement the variable of attendance within the schools was used as a measure. In the three high schools, this study found evidence that students in pathways were more engaged than similar peers. Specifically, pathway students were more likely than their non-pathway peers to be more engaged in school, indicating that pathways may be more likely to engage students so that they are motivated to remain in school. This particular finding is an encouraging early indicator that pathways may be appealing to students in schools in ways that translate into tangible behavioral change in keeping adolescents engaged in education.
To evaluate school success the variable of progress toward high school graduation within the schools was used as a measure. Generally, this study found evidence that non-pathway students were making progress toward graduation at higher rates than pathway students. A site-by-site analysis indicated that this variable requires attention by the district and site leadership to discern the disparity in the findings.

To assess student academic achievement, this study utilized the variables of PSAT and CAHSEE passing rates. Overall, in more instances than not, the PSAT passing rates were higher for pathway students than their non-pathway counterparts. This may reflect an early indication of the effective preparatory nature of the pathways curriculum. A similar pattern was observed for the CAHSEE passing rates in both ELA and math. Analyses of student achievement indicators for the CAHSEE suggest that pathway students may be negotiating high school well. The CAHSEE outcomes analyses indicate that based on pathway student results, Linked Learning students have stronger outcomes than their school non-pathway peers.

In summary, in examining the three constructs undergirding this study, student engagement, school success, and academic achievement, with the exception of school success, pathway students appear to outperform their non-pathway peers.

In interpreting the results of this study, caution is heeded in that the findings from the student samples in this study are not representative of the entire Linked Learning
District Initiative pathways. These preliminary results indicate that Linked Learning in the three high schools is providing a scaffolding structure for increased student achievement and may provide positive experiences for pathway students in future years. This research has concluded that pathway students are having an above average high school experience.

**Implications**

The triangulation of the research literature, the methodology, and the findings of this study pose potent policy implications. Below are these implications.

**Program Structure**

While located in the same district, the structure of the Linked Learning programs in this study varied from high school to high school contingent on the size of the school and the leadership in the school. The three high schools in the study had flexibility in several important areas that may impact the structure of the program: graduation requirements, scheduling, and expanding or limiting the number of pathways offered. The implication for program structure becomes one of the district’s roles in ensuring a systemic approach of offering a well-balanced number of pathways to address the academic interest and job training needs of its student demographics.
Program Implementation

With the rollout of Common Core State Standards, the next logical implication is one of implementation alignment. In other words, how do the Linked Learning standards align to the Common Core State Standards and how will this alignment play out in the Common Core assessments? A key implication for the district in this study is in ensuring alignment of pathways curriculum, instruction, and assessment with Common Core State Standards.

Inter and Intra Program Coordination

Program coordination within the high schools varied, with some programs affording students flexibility in entering and exiting pathways while others offered targeted counseling to students in pathways. Similarly, coordination with postsecondary institutions varied among the three high schools in this study occurring through both formal articulation agreements and informal arrangements. The most effective inter and intra program coordination occurred when students were given the opportunity to earn dual credit by obtaining both high school and college credits for some courses offered at the high school.

In summary, the Linked Learning equity agenda remains a work in progress. The actions districts take to structure pathway choice and access help determine which students choose to apply to and enroll in pathways. Different district policies either
facilitate or hinder open and equitable access to certified pathways. As districts work to make Linked Learning pathways accessible for all students, district and pathway personnel will need to consider how their choice policies and recruitment practices influence student pathway selection and enrollment. Districts need to remain vigilant and carefully monitor enrollment patterns particularly for English Language Learners and special education students that more closely approximate the district’s demographic make-up (Guha et al., 2012).

**Recommendations for Further Study**

As with other research designs, one of the intents of this work was to recommend a direction for further studies in the area of Linked Learning. These recommendations are aligned to similar recommendations made by Guha et al. (2012) in their evaluative study of California’s Linked Learning District Initiative.

The impact of Linked Learning on *Curriculum, Instruction, and Assessment* is an area of consideration for further study. Improvement in student outcomes will come from changes in teacher and student relationships in high school classrooms. The Linked Learning Initiative poses potential for addressing this vacuum in secondary reform efforts with its focus on integrated curriculum, authentic assessment, and rigorous student-centered instruction more so now with the initial implementation of the Common Core State Standards.
The lack of a focus to teaching and learning continues to be prevalent among secondary reform initiatives. Another area that may merit further research could include an investigation of the impact of Linked Learning on Teaching and Learning. Guha et al. (2012) asserted that the incorporation of rigor and relevance into pathway teaching and learning could enhance teachers’ understanding of the levels at which they will need to prepare students to perform. Teachers become invested once they understand how clarifying pathway outcomes would align and focus their other efforts related to pathway curriculum and instruction.

In the area of Work-Based Learning, further studies could analyze the effect of Linked Learning on bridging or aligning the workplace competencies with schoolwork. Pathways are charged with building work-based learning experiences affording students the opportunity to gain exposure to and experience with the pathway theme. A closer examination of how pathways are making progress in developing an array of work-based learning experiences that align with the academic and technical components of a pathway theme could inform Linked Learning program improvement.

Finally, further studies could be conducted on the impact of Linked Learning on Career Navigation. In addition to equipping students with skills to succeed in a global economy, further research could be conducted on how pathways provide students with opportunities to learn how to navigate through the collegiate and professional worlds.
Conclusion

Since 2006, The James Irvine Foundation has invested more than $100 million in Linked Learning, a promising approach to transforming education in California. In 2009, Irvine launched the California Linked Learning District Initiative to demonstrate this approach in nine districts. Multiyear evaluations for this large initiative have been conducted by research agencies with the purpose of documenting the results and lessons from districts that are implementing Linked Learning systemically. Linked Learning integrates rigorous academics with real-world experiences. This approach aims to transform education into a personally relevant, wholly engaging experience — and open students to career and college opportunities they never imagined (Guha et al., 2014).

By focusing on a micro perspective of the impact of Linked Learning on a single urban school district, this study has added to this work.

The significance of this study was guided by three premises unveiled by Gray and Hackling (2009) in their research on Linked Learning.

1. That students’ perceptions of the school culture and the extent to which it satisfies their social, academic, and aspirational needs are indicators of the wellbeing of high school students.

2. That the level of engagement of high school students influences the quality of their participation and retention.
3. That there are critical dimensions of a supportive school culture that influence quality student retention and participation.

In their four-year evaluation study, Guha et al. (2014) concluded that as a major twenty-first century redesign of high schools with far-reaching implications for how given district does business, Linked Learning can succeed and be sustained as a systemic initiative when it is positioned and supported as a long-term priority. This district-wide approach requires tremendous up-front support from and planning by high-level district leaders who create and communicate a vision for Linked Learning, foster stakeholder buy-in, and establish supportive staffing, policies, and structures before shifting focus to the many details of pathway implementation.

In conclusion, through a literature review on Linked Learning, through the development of a conceptual framework that focused on three research-based constructs and three sets of research questions, this study has contributed to the research on the role that Link Learning pathways may play in remedying course equity and access issues (Cotton, 1996) in comprehensive high schools. This work has described the challenges and successes practitioners encountered when developing and implementing practices and systems in Linked Learning pathways as well as the conditions that enabled this work.
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