**An Analysis of Career Academy Participant Postsecondary Success—Entry, Persistence, and Completion as Demonstrated by USI, an Urban Serving Intermediary**

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## Abstract

Previous research has provided support that there is a relationship between career academy participation and improved academic and postsecondary preparation. However, the scope of career academy literature is limited regarding cross-sectional research focused on academy participants' postsecondary success. The focus of this study was to examine the impact of health career academy participation on participants' postsecondary success (enrollment, persistence, and completion rates) by examining USI's academy participants' postsecondary data compared to non-participated student data. This study used a quantitative causal-comparative research design using archival data from USI, an urban-serving intermediary in Kansas City. The sample size (n = 543) included USI Health Academy participated students (n = 317) and non-participated (n = 226) demographically matched students as a comparison group. All students attended USI's partner high schools and graduated between 2011 and 2019. All three research questions focused on postsecondary enrollment, persistence, and completion (two-year, four-year, or certification) and were analyzed using the chi-square test of independence to examine the impact of USI health academy participation on postsecondary outcomes. Results from the study were consistent across all three hypotheses: a statistically significant difference, indicating that USI Health Academy participation may positively impact postsecondary enrollment, persistence, and completion for academy participants.

## Dedication

The paper is dedicated to my angels, Alice Rebecca Newman, Alexis Eva Haynes, and Ella Davis.

Lawrence Christopher, love conquers all.

Mom, thank you for teaching me how to dream big.

Mom, Laverne, and Sunny thank you for loving me as your daughter.

Dad, Rudi, and DaVon, this is just the beginning of the Binion legacy.

Avery, Olivia, Miles, and Brookie Baby—GeeGee loves you. Thank you for your unconditional love and snuggles.

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# Chapter 1

## Introduction

According to the U.S. Department of Education National Center for Education Statistics (NCES), in 2016, if you were Black in America, you were four times less likely to attend college (NCES, 2016). Per the NCES reports, not much has changed for historically excluded students; from 2000 to 2019, the percentage of college students at degree-granting institutions increased incrementally across Black (from 12% to 13%) and Hispanic (from 10% to 19%) students, while White student enrollment decreased (from 70% to 55%) (NCES, 2021a). These statistics are disheartening, especially for urban school districts mainly serving low-income Black and Hispanic students. According to Nichols, Eberle-Sudré, and Welch (2016), college-going trends in urban communities have shown an increase in the achievement gap for postsecondary completion between White and Black students. Although many high schools have implemented college and career-ready standards within the school framework and curricula to close the achievement gap under the Race to the Top Program, many historically excluded students still leave high school either underprepared for success in postsecondary programs or without a viable postsecondary plan (USDOE, 2015). Additionally, fewer Black students are enrolling in college; the percentage of Black high school completers who enrolled in college in 2019 was 49.8% compared to 62% in 2010 (NCES, 2021b). The drop in enrollment for White students was less than 3% from 2010 to 2019, with the current percentage of recent White high school completers enrolled in college as 68%. As a mid-point benchmark between 2010 and 2019, the achievement gap stratified by race and socioeconomic status was further evidenced by the NCES reports of immediate college

enrollment in 2015—which indicated an 83% rate for students from high-income families compared to 63% for students from low- and middle-income families (NCES, 2017a). For that same year, NCES also reported the percentage of children under 18 living in poverty was highest among Black, Hispanic, and American Indian/Alaskan Native communities, and children in these historically excluded groups also had the highest percentages of parents who had not completed high school (NCES, 2017a).

Similarly, a longitudinal study of high school students graduating in 2006 reviewed college enrollment and employment across different socioeconomic statuses and found in 2016, the percentage of lowest socioeconomic status students who were neither enrolled in college nor employed was around five times larger than the corresponding percentage for the highest socioeconomic status students (NCES, 2019). While college enrollments have increased, they continue to remain lower for historically excluded students—low-income and Students of Color (Carnevale, 2019; Shapiro et al., 2017).

Since they were developed in 1969, career academies have been part of the solution for improving student outcomes during and after high school (Kemple, 2001; Kemple & Scott-Clayton, 2004; Kemple & Snipes, 2000; Kemple & Willner, 2008; Stern et al., 2010). Career academies have aided many students to successfully transition from high school to postsecondary education. Due to the expansion and success, career academies have grown from one academy in Philadelphia, Pennsylvania, to approximately 7,000 nationally (Stern et al., 2010). Per Stern, Dayton, and Raby (2010), this increasing number of career academies can be attributed to the success of academy

students, who perform better in high school than their demographically matched peers in terms of grades, attendance, and discipline.

Based on research conducted by the What Works Clearinghouse (WWC), a career academy has three critical features as defined by the National Career Academy Coalition (NCAC), and when these characteristics are present, more low-income students finish high school and college (Maxwell & Rubin, 2000). The three critical features are small learning community clusters, career themes relevant to local economies, and partnership development with industry, community, and postsecondary education who advise on curriculum and support the career academy framework (USDOE, 2015). Dayton (2010) confirmed these three critical features and noted them as the standard definition of a career academy adopted by the following national organizations: The California Partnership Academies, the Center for the Social Organization of Schools, MDRC (formerly Manpower Demonstration Research Corporation), the National Academy Foundation (NAF), the NCAC, the Philadelphia Academies, Inc., and the Southern Regional Education Board.

In addition to career academies' effects on student achievement and attendance, Haick (2010) showed students in a career academy setting felt an increased sense of belonging, motivation, and confidence. As a result, students in the career academy setting also felt more connected to their school, reporting they had better relationships within the school community (Haick, 2010). Other research studies have found evidence that career academies have positively affected the success and engagement of students compared to those of non-academy students. Charlton, Lepley, and Workman (2013) found the career academy model effectively increased student achievement and engagement, as

demonstrated by increased graduation rates and test scores. The Charlton et al. (2013) study was conducted in the Metropolitan Nashville Public Schools with an analysis of student assessment scores (e.g., PLAN and End-Of-Course/EOC testing) and average yearly graduation rates to measure the success of the academies. PLAN is a product of ACT and is a standardized assessment measuring academic development and future performance on the ACT (PowerScore, 2022). EOC tests assess the state academic standards and measure students' competency with those standards (TNDOE, 2022). A similar study conducted with the North Carolina Wake County Public School System (cohorts of 2009-10 to 2012-13) provided evidence that participating in a career academy positively impacted high school and college outcomes (Hemelt et al., 2019). The authors found that students entering career academies were higher performing in comparison to their non-academy peers. Further, the study found that career academy participation increased the likelihood of high school graduation and college enrollment and reduced absences in ninth-grade students (Hemelt et al., 2019).

In alignment with Hemelt et al. (2019), this study sought to understand and examine the impact of an urban serving intermediary's (USI) career academy participation on improving student outcomes after high school in comparison to non-academy peers. This study focused on research questions related to the probability of success by examining USI's academy participants' college enrollment. For the purposes of this study, college enrollment and success are defined as postsecondary enrollment, persistence, and completion rates.

**Background**

USI, an urban-serving intermediary in Kansas City, Missouri, has a mission to prepare Kansas City's urban high school students for success in college and a career. USI works with 15 high schools, 13 middle schools, and 18 elementary schools; these schools collectively serve more than 27,950 students in kindergarten through 12th grade (USI, 2016a). USI utilizes three strategies to achieve its mission: Math and Literacy Benchmarking, College and Workforce Preparation, and Career Academies. USI created and facilitated seven academies: Business & Finance Institute (BFI), Design, Engineering, Health Academy (HealthStart and Life Sciences), Student Law Academy, Supply Chain, and TechStart (Pathways to Technology). USI's career academy strategy serves five urban (low-income) Kansas City school districts and two charter schools (USI, 2016a). USI's seven career academies prepare Kansas City's urban students for the regional workforce by providing intensive preparation for high-growth career opportunities.

Within the career academy structure, students can gain career awareness, exploration, and preparation through the following methods: industry-themed projects, guidance and mentoring from industry professionals, immersive summer institutes that extend academic learning, dual credit and enrollment opportunities, internships, and opportunities to obtain workforce credentials. USI's career academies partners include:

- School Districts and Charter Schools: Kansas City, Kansas Public Schools; Center School District; Hickman Mills School District; Grandview School District; Kansas City Public Schools (MO); Allen Village School; and Guadalupe Centers Charter Schools.

- Partner businesses include State Street; PricewaterhouseCoopers (PwC); BMO Harris Bank; Sprint Accelerator; Saint Luke's Hospital; Saint Luke's Neuroscience Institute; City of Kansas City, Missouri, Health Department; Children's Mercy Hospital; Truman Medical Centers; Area Health Education Centers (AHEC); CEVA Biomune; Kansas City Area Life Sciences Institute, Inc. (KCALSI); Burns & McDonnell; Honeywell; Cerner Corporation; Garmin; Google Fiber; Hallmark; Kansas City Start Up Village; KCNext; Lexmark; and PeopleAdmin.
- Partner postsecondary institutions include Avila University, University of Missouri-Kansas City (UMKC), Metropolitan Community College-Longview (MCC-Longview), Metropolitan Community College-Penn Valley (MCC-PV), Kansas Community College (KCKCC), University of Kansas Medical Center (KU Med), and Kansas State-Olathe (USI, 2016b, 2021b).

The USI career academy model has gathered support as a successful strategy, as evidenced by the following data points retrieved from the Career Academies Evaluation Report (USI, 2016b) during the 2015-2016 school year:

- On average, career academy students outperformed their peers in attendance, GPA [grade point average], and ACT scores.
- Seventy-nine students (17% of all academy students) completed a college course in the 2016-2017 school year; these students completed 337 college credit hours.

- Forty-eight graduates (66% of all academy graduates) completed a college course through the academy; these students completed up to five courses and 369 college credit hours.
- Forty students earned a workforce credential in the past year, and 21 students are graduating, having earned a workforce credential while in the career academy that will benefit them when they enter the workforce.
- Eighty percent of career academy students completed at least one workplace tour, career readiness exploration experience, or customized campus visit this year. (Summary Section, para. 2)

Since the 2009-2019 academy years, USI's career academies have collectively served 853 students within six urban public school districts (USI, 2019). USI's career academy students have shown considerable success, with 100% of the career academy participants graduating from high school, compared to the national 83% graduation rate for public high schools (NCES, 2017b). Additionally, USI's career academies have a 74% college enrollment rate compared to the national 63% college enrollment rate of students from comparable (low-income and middle-income) socioeconomic statuses (NCES, 2017a). USI reports 119 active students in Life Sciences Academy and 68 graduates in 2021 for the 2020-2021 school year (USI, 2021b). Of the active Life Sciences Academy students, 30 students (25%) earned market value assets, defined as a workforce credential (17 earned a Certified Nursing Assistant or Central Services Processing credential), college credit coursework (43 completed a college course; 25 completed nine or more college credit hours), or high-value scholarship (ten students earned high-value scholarship) (USI, 2021b).

## Statement of the Problem

USI has achieved considerable success with various student outcome measures for career academy graduates. For example, focusing on the Health Academy, students outperform their non-academy peers on attendance (97% as compared to the school rates of 88-96%) and GPA (average of 3.28 with a comparison to district averages, which fall between 2.07 and 2.78 for grades 9 through 12) (USI, 2016c). However, much remains unknown about the career academy participants' persistence and completion of postsecondary programs. Additionally, compared to peers from their high schools, composite ACT scores for Health Academy students were higher on average in all ACT subject areas (USI, 2016c). USI utilizes the National Student Clearinghouse (NSC) for postsecondary enrollment reporting and verification up to one year after high school graduation. However, analysis has not been conducted at year-four and year-six after high school graduation (USI, 2018).

For this study, a review of year-four and year-six health career academy student outcome data for postsecondary enrollment were used to provide long-term persistence and completion rates. Students choose varying pathways to degree completion, and the majority of students no longer follow the traditional pathway of two years for an associate's degree and four years for a bachelor's degree; longitudinal data demonstrate the time to degree for USI's career academy participants (Shapiro et al., 2017).

## Purpose of the Study

The purpose of this quantitative causal-comparative study was to examine the impact of USI's career academy on participants, by identifying cohorts of USI's Health Academy participants and examining their success post-high school graduation,

compared to demographically matched students interested in pursuing post-secondary education and/or career at the following intervals: year-one, year-two, and year-six. For these purposes, success was defined as entry, persistence, and completion of a postsecondary program (two-year, four-year, or certification).

**Significance of the Study**

Previous career academy research has focused on the impact of career academy participation on student outcomes in achievement, attendance, and discipline during high school (Stern, 2010). Previous studies have also focused on the career academy framework as a strategy for student success, engagement, and college preparation (Charlton et al., 2013). The scope of career academy literature is limited regarding cross-sectional research focused on career academy participants' success in postsecondary programs and measuring non-cognitive factors such as engagement, motivation, and persistence. The strength of this study was the established data sets regarding student outcomes for USI's career academies—national data, local data, and USI's Data Dashboard. The USI Data Dashboard includes partner districts' student attendance, engagement, achievement, and postsecondary attainment data. These data were expanded in this study to include postsecondary graduation outcomes.

Hazel (2005) provided a quantitative analysis of smaller learning communities within high schools to ascertain if career academies could be a future recommendation for modifying and improving instructional programs in public high schools. This study mirrored Hazel's intent to analyze urban schools organized into career academies and the career academy model's impact on student success (e.g., grade point averages, attendance, and standardized test scores) compared to non-career academy-organized

schools. This study will add to Hazel's work by reviewing additional student success measures, such as postsecondary success, that were not outlined in the Hazel study. This researcher evaluated this study's data to deepen the current literature about strategies for supporting students graduating from career academies through postsecondary completion. Furthermore, findings from this study may inform intermediaries and school districts organizing career academy learning environments when selecting and implementing strategies for increasing students' postsecondary success.

**Delimitations**

According to Lunenburg and Irby (2008), delimitations are boundaries set by the researcher on the purpose and scope which serve to narrow the study. To better understand USI's involvement as an intermediary, only schools partnered with USI were included in this study. Additionally, the focus was limited to only one of the six USI-themed academies, the Health Academy. Only students involved with health sciences between the graduation years of 2010 and 2019 were included in the analysis for the current study.

**Assumptions**

According to Lunenburg and Irby (2008), assumptions include the nature, analysis, and interpretation of the data, which provide meaning and context to the conclusion. This study included the following assumptions: (1) the archived data sets are accurate and based on a historical period of 2010 to 2019 graduation years; (2) career academy experiences are similar across different schools/districts; and (3) other in-school and out-of-school experiences do not influence career academy participation.

## Research Questions

**RQ1**. To what extent does participation in the USI Health Academy have an impact on postsecondary enrollment when compared to non-participated demographically matched students?

**RQ2**. To what extent does participation in the USI Health Academy have an impact on postsecondary persistence when compared to non-participated demographically matched students?

**RQ3**. To what extent does participation in the USI Health Academy have an impact on postsecondary completion when compared to non-participated demographically matched students?

## Definition of Terms

This section provides key terms and concepts that are utilized throughout this study and are provided for clarity. In other contexts, these terms may have alternative definitions.

**Career Academy.** "Career academies are designed to prepare students for both college and careers. They are schools within schools that link students with peers, teachers, and community partners in a structured environment that fosters academic success" (National Career Academy Coalition, 2019, para. 1). The career academy has three components of success: a small learning community (SLC), a career-themed curriculum, and an advisory board.

**Career Pathways.** A combination of rigorous and high-quality education, training, and other services to prepare students for success in various postsecondary education options and occupations (Workforce Innovation and Opportunity Act, 2014).

The training and education offered in a career pathway are often concurrent with workforce preparation activities and may include the accrual of stackable credentials and certificates. Career pathways align with industries' needs and regional and national economies.

**Career Technical Education (CTE).** CTE provides students with opportunities to learn technical and employability skills that integrate into a theme, complementing their academic studies. CTE programs offer specialized technical instruction and can culminate in postsecondary degrees or certificates, apprenticeships, or employment. (USDOE, 2019).

**Cohort.** A group of demographically matched students (age, graduation year, school, career academy).

**Comprehensive High School.** Comprehensive high schools are inclusive and meet the needs of all students—encompassing academically gifted to academically challenged (Maxwell & Rubin, 2000). Comprehensive schools are grounded in a core general education curriculum which includes vocational programs and college preparation. In the comprehensive school format, the teacher leads with pedagogy and curriculum differentiation to meet varying students' needs.

**Dual Credit.** Advanced coursework and placement opportunities allowing high school students to receive college credit for advanced high school courses. Typically,

dual credit courses are taught by a high school instructor who is certified to teach dual credit courses.

**Dual Enrollment.** Concurrent enrollment in a high school and a postsecondary institution; earning credits toward a postsecondary degree while enrolled in high school.

**Intermediary.** A nonprofit working in collaboration and on behalf of other groups (nonprofits, educational entities, and corporations) to create public/private partnerships that leverage funds and human capital to address social problems.

**Market Value Asset.** Workforce credential or certificate, dual credit or dual enrollment college coursework, or high-value scholarship (USI, 2021b).

**Postsecondary Completion.** Completion was measured by degree completion from a 2-year, 4-year, or postsecondary certification program within six years after high school graduation. The completion benchmarks were predetermined by the methodical approaches identified by NSC.

**Postsecondary Entry.** Entry was measured by enrollment in a postsecondary program in two categories—the first fall after high school graduation or the first year after high school graduation. The entry benchmarks were predetermined by the methodical approaches identified by NSC.

**Postsecondary Persistence.** Persistence was measured by enrollment from the first to the second year of postsecondary programming. The persistence benchmarks were predetermined by the methodical approaches identified by NSC.

**Postsecondary Success.** Entry, persistence, and completion of a postsecondary program (2-year, 4-year, or certification).

**Small Learning Community (SLC).** A community of learners identified by interests that are aligned to specific career clusters within a larger school setting. An SLC includes a core group of interdisciplinary teachers and support staff who cohort SLC students in core and elective courses.

## Organization of the Study

This study is organized into five chapters. This chapter provided an introduction, discussed the background of the study, statement of the problem, purpose of the study, significance of the study, delimitations, assumptions, research questions, and definition of terms. Chapter 2 provides a review of the literature, providing context and rationale for conducting this study. Chapter 3 details the research design, participant selection, data collection procedures, data analysis, hypothesis testing, and limitations of the study. Chapter 4 presents descriptive statistics and the results of the hypothesis testing. Chapter 5 provides a study summary, findings related to the literature, implications for action, recommendations for future research, and concluding remarks.

# Chapter 2

## Review of the Literature

This chapter explores currently existing literature relevant to this study's research questions. First, the theoretical and conceptual foundation guided by Kemple's model and Astin's theory of student involvement is presented. Second, an overview and history of comprehensive high schools and career preparation highlighting alignment with early college and dual enrollment models are reviewed. Third, a summary of career academies in conjunction with Career and Technical Education is examined. Lastly, career academies are defined from historical perspectives, and their benefit to students and their impact on high school participants' postsecondary entry and attainment are explored.

## Conceptual Foundation

While this literature review did not yield a specific theory addressing career academies, this study drew from Kemple's model and Astin's theory of student involvement to provide a conceptual foundation for this study.

### Kemple's Model

Career Academies are historically framed with the following features: small learning community or school-within-a-school, content-focused curriculum aligned to a career pathway or theme, and partnership models with industry and higher education. Kemple's (2001) conceptual model of a career pathway "through which the Career Academy approach is hypothesized to affect students' outcomes during high school and thereafter" provided a guiding organizational structure for this study (p. 3). As shown in Figure 1 in Appendix A, Kemple's (2001) model outlines three fundamental elements of the career academy approach:

> (1) The intensive collaboration afforded by the school-within-a-school organization is hypothesized to enhance interpersonal supports; (2) the combination of academic and vocational courses is hypothesized to help focus curricula and enrich teaching and learning; and (3) the employer partnerships are hypothesized to increase career awareness and work-based learning opportunities. (p. 3)

Combined, these foundational elements intend to increase student's engagement in school, prevent dropout, enhance academic outcomes, increase graduation rates, and promote college and career readiness (Kemple, 2001).

### Astin's Theory of Student Involvement

Also guiding this study was Astin's (1984/1999) theory of student involvement, where involvement refers to "the amount of physical and psychological energy that the student devotes to the academic experience" (p. 518). By this definition, a highly involved student may spend considerable energy and time in their studies, activities, and relationships; oppositely, an uninvolved student will neglect those areas and relationships (Astin, 1984/1999). Astin (1984/1999) also connected the conceptual framework of student involvement to Freud's concept of cathexis and noted, "Freud believed that people invest psychological energy in objects and persons outside of themselves" (p. 518). Linking the conceptual framework of student involvement and the concept of cathexis forms an assertion: "It's not so much what the individual thinks or feels, but what the individual does, how he or she behaves, that defines and identifies involvement" (p. 519). A student can cathect on their studies, activities, and relationships; more investment or involvement can enhance retention, and according to the theory, "the

greater the student's involvement…the greater will be the amount of student learning and personal development" (Astin, 1984/1999, pp. 528–529).

Astin's (1984/1999) theory of student involvement has five guiding propositions:

> 1. Involvement refers to the investment of physical and psychological energy in various objects. The objects may be highly generalized (the student experience) or highly specific (preparing for a chemistry examination). (p. 519)
>
> 2. Regardless of its object, involvement occurs along a continuum; that is, different students manifest different degrees of involvement in a given object, and the same student manifests different degrees of involvement in different objects at different times. (p. 519)
>
> 3. Involvement has both quantitative and qualitative features. The extent of a student's involvement in academic work, for instance, can be measured quantitatively (how many hours the student spends studying) and qualitatively (whether the student reviews and comprehends reading assignments or simply stares at the textbook and daydreams). (p. 519)
>
> 4. The amount of student learning and personal development associated with any educational program is directly proportional to the quality and quantity of student involvement in that program. (p. 519)
>
> 5. The effectiveness of any educational policy or practice is directly related to the capacity of that policy or practice to increase student involvement. (p. 519)

Students dedicating time to the small learning community demonstrate increased involvement or engagement in the career academies framework. Increased involvement is

demonstrated by opting into the career academy, engaging in the content-focused curriculum aligned to a career pathway or theme, and the partnership models with industry and higher education, including dual credit coursework, mentoring, and summer programming (USI, 2021b). Astin's fourth and fifth propositions regarding educational programming and policy relate to career academies' capacity to directly impact student involvement or engagement within the academy and school district by informing policies on school structure and the career academy framework, e.g., school master schedule, college and career benchmarks, and graduation requirements. Astin's student involvement theory also provides a tool for educational practitioners "to design more effective educational programs" and prepare students for postsecondary success (Astin, 1984/2001, p. 519). An improved design could be fostered by modeling the tools and characteristics students will need to emulate in college to increase learning, engagement, and overall success post-high school. Astin's (1984/2001) model focuses on designing effective educational programs that increase student involvement and prepare students for postsecondary success. Developing an effective continuum of educational programs with interpersonal support for students aligns closely with Astin's second proposition, and it is the "ultimate goal of the Career Academies," which is "to prepare young people for postsecondary education and employment" (Kemple, 2001, p. 23). Kemple and Snipes (2000) reported in a ten-year MDRC Career Academies Evaluation that participating in academies increases students' level of interpersonal support. These interpersonal supports are increased as a continuum through career awareness and work-based learning activities, thereby decreasing dropout rates and improving school engagement for high-risk and medium-risk subgroups (Kemple & Snipes, 2000).

Figure 2 in Appendix B shows a conceptual model of the USI Career Academy approach, which provides a foundation of the continuum of support and best practices aligned to the career academy structure. The conceptual model of USI's Career Academy approach illustrates similarities to the fourth and fifth propositions of Astin's theory of student involvement—quality and quantity of student involvement and the effectiveness of educational policy or practice within Kemple's 2001 model (Astin, 1984/1999; Kemple, 2001). No specific theory addresses career academies' impact on postsecondary student enrollment and attainment; therefore, this study's conceptual foundation draws from Kemple's model and Astin's theory of student involvement.

**Overview of Comprehensive High Schools and Career Preparation**

The role of the 20th century comprehensive high school was to prepare American youth for the labor market and serious jobs and facilitate college access and productive citizenship (Grubb & Lazerson, 2004). According to Maxwell and Rubin (2000), the current model of the comprehensive high school has at least three defining characteristics:

> First, it is inclusive, striving to meet the needs of all students, including the academically gifted and the academically challenged, the vocational and the college-oriented student, the wealthy and the poor. Second, the high school's curriculum is grounded in a core program of general education that allows for differentiation in the course of study. This curriculum differentiation is targeted to meet the needs of specific groups of students. Third, a teacher-centered pedagogy dominates the learning environment. A teacher is the "sage on the stage" who provides relevant material to students. Teachers consider themselves and are

> viewed by students as curriculum area experts who transmit information to students predominantly by lecturing and otherwise imparting facts and guidance. (p. 10)

The vocational aspects allowed schools to offer career-focused curricula, and students could specialize in their future college and career goals. According to Maxwell and Rubin (2000), this specialization occurred "in theory, within a setting that promoted unity among students," and simultaneously, "businessmen on school boards began promoting the scientific principles of Frederick Taylor as a way to administer education efficiently" (p. 11). There was an evolution of managing increased enrollment from this framework by "producing, educational products, students, at the lowest possible cost" (Maxwell & Rubin, 2000, p. 11). Additionally, the framework proved effective for cost-efficient curriculum delivery and implementing vocational curricula to provide students with specific skills (Maxwell & Rubin, 2000). Further, this framework yields an enterprise approach that emphasizes efficiencies and predictability through standardized curriculum and assessments irrespective of where the diploma or degree is earned (Schapper & Mayson, 2004).

Since 2004, there has been a growing sentiment that comprehensive schools remained marginally unchanged since the mid-20th century and were not producing the graduates needed to compete and succeed after high school (Achieve, 2010). This sentiment of lowered expectations for comprehensive high schools is evidenced by low graduation rates and high college remediation rates compared to the increased education and skill requirements of new and growing occupations (Achieve, 2010). This gap is further exacerbated by the decrease in well-paying jobs for which a high school education

alone is sufficient (Achieve, 2010). Achieve conducted studies of employers and two- and four-year college faculty, which confirmed what states suspected: “There was a sizeable gap between what students knew leaving high school and the actual knowledge and skills they need to be successful in college and careers” (Achieve, 2010, p. 7). Achieve labeled this disconnect the “expectations gap’’ and issued a challenge to national and state leaders to close the gap by adopting and implementing college and career-ready standards and policies for all high school graduates during its 2005 National Education Summit on High Schools in partnership with the National Governors Association (Achieve, 2010).

During the Summit, governors, corporate CEOs, and education leaders from K-12 and higher education acknowledged that if states did not dramatically raise expectations and achievement in high schools, America’s ability to compete globally would be at risk (Achieve, 2010). Consequently, Achieve and 13 states launched the American Diploma Project (ADP) Network (Achieve, 2010). ADP Network, which now includes 35 states, educates 85% of the nation’s students; it is committed to closing the expectations gap by adopting and implementing the following college and career-ready policies:

> Aligning high school academic content standards in English and mathematics with the demands of college and careers; Establishing graduation requirements that require all students to complete a college- and career-ready curriculum; Developing statewide high school assessment systems anchored to college- and career-ready expectations; and creating comprehensive accountability and reporting systems that promote college and career readiness for all students. (p. 7)

In 2014 and 2015, Achieve reported the expectations gap was closing, but narrowly. At that time, regarding preparation, employers (62%) and college faculty (78%) thought that public high schools are not doing an adequate job of preparing students for success in college and careers; in 2004, these rates were 38% for employers and 65% for college faculty (Achieve, 2004, 2014, 2015, 2016). Comparatively, 96% of two-year college faculty and 88% of four-year college faculty also reported students arriving at college with gaps in their preparation (Achieve, 2014, 2015).

In 2016, Achieve performed a comprehensive review of student performance against college and career readiness indicators identified through the ADP Network for high school graduates' enrollment, persistence, and remediation rates at two-and four-year colleges across all 50 states and the District of Columbia (Achieve, 2016). Achieve found that "states report on their graduates' postsecondary outcomes at very different levels of comprehensiveness" and vary in definitions of enrollment, remediation, and persistence (2016, para. 3). A common language around definitions and reporting can simplify challenges when comparing data regionally and nationally; the 2016 Achieve report represented the first time these publicly available data had been compiled to provide a national snapshot of college and career readiness (Achieve, 2016).

The college and career readiness benchmarks included students' performance on assessments, completing a rigorous course of study, and earning college credit while in high school (Achieve, 2016). Although the analysis was limited due to differing definitions, remediation for any course was reported for Missouri (MO) at 48% (two-year) and 21% (four-year); and Kansas (KS) at 42% (two-year) and 16% (four-year) (Achieve, 2016). The definition for remediation in the 2016 Achieve report for MO and

KS reported rates for first-time, degree-seeking students who enrolled in math, English, or any remedial courses at the state's two- and four-year institutions for the class of 2014 (Achieve, 2016).

Current schools of thought on reimagining school design note that comprehensive schools' current vision is antiquated and not challenging for students; as a result, comprehensive schools leave students behind, requiring remediation in postsecondary coursework (Ewing Marion Kauffman Foundation, 2019; Lippman et al., 1996). Likewise, Lippman et al. (1996) reported that "many Americans believe that urban schools are failing to educate the students they serve" (p. v). There is a pervasive critique and "perception, fed by numerous reports and observations," that "urban students achieve less in school, attain less education, and encounter less success in the labor market later in life" (p. v). Lippman et al. (1996) noted reports on the "condition of urban schools feed the perception that urban students flounder in decaying, violent environments with poor resources, teachers, curricula, and with limited opportunities," hence, urban schools have been unable to provide an adequate education to all student groups (p. v.).

According to Maxwell and Rubin (2000), "curriculum tracking and teacher-centered pedagogy are heavily criticized for their failure to motivate and to meet the educational needs of all students" (Maxwell & Rubin, 2000, p. 12). Lippman et al. (1996) noted that comprehensive schools fail to educate the students they serve; higher education institutions, the likely succession plan, are also struggling. Similarly, higher education institutions are working to determine if students are ready for postsecondary education rigor and becoming more focused on what readiness means and how it presents.

Previously, GPA was a measure of success; however, today, high school GPA does not solely translate to postsecondary success. According to Adcock and Surface (2019):

> It used to be that a student's grade-point average (GPA), attained during his or her final years of high school, was the guide many institutions used to determine if a student was ready for higher education. Researchers in this topic have shared that leaders at all levels of education believed that students with a high GPA could complete college successfully and acquire a good career. Today, GPA is not enough to be successful in college and, later, in careers. Therefore, college-to-career readiness needs further scrutiny about what readiness means and how to determine whether students are ready. (pp. 37–38)

With the reinvention of the antiquated "Taylorism" approach, an efficiency framework of comprehensive schools adopted from scientific management techniques to produce skilled industrial entry-level workers with high school diplomas as an expansion of the US industrialization, the focus is now on preparing problem solvers who are ready for the world of work, college, and career (Au, 2011; Heller, 2020). Educational attainment is highly valued in the United States as trends for attainment and high school completion of all race groups have increased (Schmidt, 2018a). Comprehensive schools are designing curricular programs and partnerships to assist students in developing employability and critical thinking skills and experience to achieve higher earnings over a lifetime. Schmidt (2018b) noted the increase in value of educational attainment and postsecondary enrollment in the United States:

> The value placed on education is evidenced by the fact that 89 percent of people 25 years and older have completed high school, and 60 percent have studied

> beyond the high school level. The value placed on education is also seen in the increase in college enrollment over time, from 2.4 million students in 1955 to 19.1 million students in 2015. (p. 1)

Still, college readiness is dependent on quality K-12 education, and not all students, especially those attending comprehensive schools, have access to quality college and career preparation. Comprehensive schools are assigned based on district catchment areas deeply impacted by systemic racism, racial segregation, and redlining—the *de jure* segregation of neighborhoods along racial lines enforced by law and public policy (Rothstein, 2015). Despite the desegregation efforts of the 1960s and 1970s, "education policy is constrained by housing policy: it is not possible to desegregate schools without desegregating both low-income and affluent neighborhoods" (Reardon et al., 2019; Rothstein, 2015). Comprehensive schools are highly segregated, with persisting social and economic disadvantages in racial and economic homogenous schools, depressing student performance (Rothstein, 2015; Rumberger & Palardy, 2005). Reardon et al. (2019) asserted while the country has retreated from the notion that segregation as a standalone is harmful, "quietly settling for an education policy regime that accepts segregated schools as a given and asserts that it is possible to have equally high-quality schools in every neighborhood, regardless of racial or economic composition" (p. 2). Rothstein (2015) disagreed, noting:

> But the conventional wisdom of contemporary education policy notwithstanding there is no evidence that segregated schools with poorly performing students can be "turned around" while remaining racially isolated. Claims that some schools,

> charter schools in particular, "beat the odds" founder upon close examination. (para. 31)

Still, "racial segregation may concentrate minority students in high-poverty schools that provide significantly lower levels of educational opportunity than schools serving higher-income students" (Reardon et al., 2019, p. 8). Likewise, Reardon et al. (2019) noted, "Racial segregation also concentrates white students in advantaged neighborhoods with better early childhood programs, less crime, more highly educated neighbors and better public services with support" (p. 8). Stratification of educational opportunity occurring in and out of school and within higher education may be considered a source of inequality, where students do not have the same access to opportunities based on historical and systemic racism—inequitable access to education, distribution of income, and geographic and territorial inequalities (Mostafa, 2009). Systemic racism directly impacts Black, Indigenous, and other non-Black Students of Color who attend schools statistically more likely to be under-resourced schools with less financial resources, failing infrastructures, and opportunities (Shapiro et al., 2013; U.S. Government Accountability Office [GAO], 2020).

A growing body of evidence indicates that increased college enrollment is a value judgment of postsecondary attainment and successful workforce entry. Carnevale, Rose, and Cheah (2011) noted, "having some postsecondary education, even without earning a degree, adds nearly one-quarter of a million dollars to lifetime earnings" (p. 4). According to Carnevale et al. (2011), a person's earning potential increases as their postsecondary completion increases. Obtaining "an Associate's degree adds another bump of nearly $200,000"; in contrast, "Bachelor's degree holders earn 31 percent more

than workers with an Associate's degree and 74 percent more than those with just a high school diploma" (Carnevale et al., 2011, p. 4). Inadequate preparation in high school leaves students with fewer choices as they graduate and enter the workforce—these few choices present gaps in their pathway to postsecondary entry, persistence, completion, and higher wages (USDOE, Office of Planning, 2016). This gap in preparation and opportunity is especially pervasive for many Students of Color; fewer high schools with high percentages of Students of Color offer advanced coursework opportunities like dual credit and advanced placement (AP) compared to high schools with low populations of Students of Color (USDOE, Office of Planning, 2016). The USDOE (Office of Planning, 2016) also reports many Students of Color, particularly from lower-income areas and in comprehensive schools, "have lower levels of academic preparation than their white peers upon entering college, which can affect degree attainment rates" (p. 6).

Tierney, Bailey, Constantine, Finkelstein, and Hurd (2009) noted to improve college entry rates, two challenges need to be addressed: 1) academic preparation by the 12th grade, and 2) students need to be guided and supported through the college-going process. Tierney et al. (2009) reported the approaches toward solving the preparation and guidance challenges include academic preparation, setting college aspirations and expectations, and assisting students in completing the necessary steps for college entry. Tierney et al. (2009) provided evidence of these steps as follows: 1) Academic preparation—courses and college-ready curriculum by the 9th grade and in-time interventions to overcome deficiencies; 2) College aspirations and expectations—college-going school culture; and 3) steps for college entry—students completing critical benchmarks for college entry including entrance exams, submitting applications,

completing financial aid applications, and selecting an institution (Tierney et al., 2009). Historically, comprehensive schools have not ensured these steps are completed for all students primarily due to the resources and staffing capacity and turnover of teachers, counselors, and principals to provide mentoring, postsecondary advising, and college and career experiences in and out of the school setting (Tierney et al., 2009; Yan, 2020).

While the traditional high school model continues to work for some students, many posit that more students are underserved by this comprehensive framework of learning and may not be at a level supporting future workforce needs (Pew Research Center, 2016). Expanding college and career opportunities from the traditional comprehensive model (six- to seven-hour school day within the confines of one high school building, moving from 45–50-minute courses) has proven to be an essential strategy for schools and districts looking to be more innovative and provide extended access to opportunities, especially for students living with unique needs and challenges (Alliance for Excellent Education, 2011; Lynch et al., 2018).

Innovative models that expand learning opportunities to include college and career-based experiences benefit students and provide continuous learning within and outside the school building while maximizing partnerships, intermediaries, and nontraditional school hours (Lynch et al., 2018). Often these innovative models stretch the confines of the comprehensive school model through personalized learning, STEM (science, technology, engineering, and math) learning, and improved administrative and opportunity structures that fit students' needs and career interests (Lynch et al., 2018).

For students, this personalized learning can be both college and career-focused with early college courses—virtual or on a college campus, through internship

experiences, in the community, and through producing quality projects within a company setting. The benefits of personalized student learning include 1) expanding student motivation and engagement, 2) increasing alignment with high school academics to postsecondary and workforce demands to reduce achievement gaps, and 3) enabling students to acquire skills while obtaining postsecondary credits (Alliance for Excellent Education, 2016; Friedman, 2020). The personalized learning approach of blending college and career is consistent with the Early College High School model of promoting students' college and career readiness, motivation, and aligning career exploration and goals (Alliance for Excellent Education, 2011; Bailey et al., 2003; Hackmann et al., 2019; Tang et al., 2008).

**Comprehensive High School and Career Academies Dual Enrollment and Early College Models' Impact**

The Early College High School was launched by the Bill & Melinda Gates Foundation in 2002 in partnership with Carnegie Corporation of New York, Ford Foundation, W.K. Kellogg Foundation, and the Early Colleges model (formerly known as the Early College High School Initiative, ECHSI). The Early College High School was a reinvention of the comprehensive school framework. The "explicit goal of the initiative to increase the opportunity for students who are disadvantaged to earn a postsecondary credential" (Song & Zeiser, 2019, p. 1). The theoretical underpinning of the Early Colleges model was the partnership with "colleges and universities to offer all students an opportunity to earn an associate's degree or up to two years of college credits toward a bachelor's degree during high school at no or low cost to the students"—the incentive of earning college credit, reducing time to graduation and debt loads were a built-in

motivation for participating students and families (American Institutes for Research [AIR], 2013 p. iv).

The five guiding core principles of the (ECHSI) were:

1. Early College (ECs) are committed to serving students underrepresented in higher education.
2. ECs are created and sustained by a local education agency, a higher education institution, and the community, all of whom are jointly accountable for student success.
3. ECs and their higher education partners and community jointly develop an integrated academic program so all students earn one to two years of transferable college credit leading to college completion.
4. ECs engage all students in a comprehensive support system that develops academic and social skills as well as the behaviors and conditions necessary for college completion.
5. ECs and their higher education and community partners work with intermediaries to create conditions and advocate for supportive policies that advance the Early College movement (Jobs for the Future, 2008, p. 2. as cited in Song & Zeiser, 2019, pp. 1–2).

In 2013 and 2019, studies by AIR and its partner, SRI International, published findings on the Early Colleges model and its impact on 1) postsecondary outcomes, 2) student outcomes based on "background characteristics (i.e., gender, race/ethnicity, low-income status, and prior mathematics and English Language Arts [ELA] achievement)" (Song & Zeiser, 2019, p. viii.). Additionally, the studies reviewed the

relationship between the Early Colleges model and "students' high school experiences (i.e., dual credit accrual during high school, instructional rigor, college-going culture, and student supports)" (Song & Zeiser, 2019, p. viii).

Sample populations from the 2013 and 2019 AIR studies included 10 Early Colleges that:

> (1) enrolled students in Grades 9-12, (2) had high school graduates by 2011, (3) used lotteries in their admission process for at least one of three incoming student cohorts (i.e., students who entered ninth grade in 2005-06, 2006-07, or 2007-08), (4) retained the lottery records, and (5) implemented the EC as a whole-school program. (Song & Zeiser, 2019, p. viii)

The AIR (2013) findings concluded:

- Early College students (86%) were significantly more likely to graduate from high school than comparison students (81%) (AIR, 2013, p. v).
- Early College students (80%) were significantly more likely to enroll in college than comparison students (71%) (AIR, 2013, p. v).
- Early College students (22%) were significantly more likely to earn a college degree than comparison students (2%) (AIR, 2013, p. v).
- The Early Colleges model's impact on college degree attainment did not differ based on first-generation college-going status, but it was generally in favor of underrepresented groups, e.g., female, minority, lower-income, higher middle school achievement). (AIR, 2013, p. vi).
- It is noted in the 2013 report that these Early Colleges models "likely attract academically prepared and ambitious students to their lotteries," and prior to

high school, “lottery applicants generally performed above the state average in the ELA and mathematics assessments” (AIR, 2013, p. vi).

The AIR findings concluded:

- Early College students (84.2%) were significantly more likely than control students (77%) to enroll in college each year between the fourth year of high school and six years after expected high school graduation (Song & Zeiser, 2019, p. ix).
- Early College students (65.8%) were significantly more likely than control students (46.8%) to enroll in 2-year colleges each year between the fourth year of high school and six years after expected high school graduation (Song & Zeiser, 2019, p. ix).
- “Early Colleges students and control students were similarly likely to enroll in 4-year colleges and selective 4-year colleges over time” (Song & Zeiser, 2019, p. ix).
- Early College students (45.4%) were more likely than control students (33.5%) to complete a postsecondary degree (certificate, two-year, four-year degrees) each year between the fourth year of high school and six years after expected high school graduation (Song & Zeiser, 2019, p. x).
- Early College students (29.3%) were more likely than control students (11.1%) to complete a two-year degree or certificate each year between the fourth year of high school and six years after expected high school graduation (Song & Zeiser, 2019, p. x).

- Early College students (30.1%) were more likely than control students (24.9%) to complete a four-year degree each year between the second and sixth years after expected high school graduation (Song & Zeiser, 2019, p. x).
- Early College "impacts on college enrollment and degree completion outcomes were similar for students with different family background characteristics," e.g., gender, race/ethnicity, or eligibility for free or reduced-price lunch. (Song & Zeiser, 2019, pp. x–xi).
- Early College "impacts on some postsecondary outcomes were stronger for students with higher levels of Grade 8 achievement" (Song & Zeiser, 2019, p. xi).
- "High school experiences significantly explained the EC impact on enrollment in any type of institution"; these experiences were measured by instructional rigor, college-going culture, and student supports. This explained, "approximately 30% the EC impact on enrollment" (Song & Zeiser, 2019, p. xi).
- "College credit accrual during high school was the strongest mediator for degree completion outcomes, particularly bachelor's degree [four-year degree] completion." This explained, "approximately 87% of the EC impact on bachelor's degree completion within six years after expected high school graduation" (Song & Zeiser, 2019, p. xi).

Another study with impactful data on early college programming is the College Now (CN) dual enrollment partnership between New York City Public Schools and the public college system, The City University of New York (CUNY). The CN and CUNY

relationship “commenced in 1984 at Kingsborough Community college, one of the public community college campuses in New York” (College Now Program, Kingsborough Community College, n.d., as cited in Britton et al., 2019, p. 3). As purported by CN, the program is the most extensive “urban dual enrollment program in the country” (Britton et al., 2019, p. 4). The CN study “sheds light on whether dual enrollment programs are successful at scale for the marginal college students in large urban districts with numerous public community colleges and a large proportion of students who are Black, Latinx, and low-income” (Britton et al., 2019, p. 4).

In CN, a city-wide dual enrollment program, students can earn up to twelve college credits during their 11th- and 12th-grade years in high school. The CN dual credits are offered across 18 participant colleges and over 440 New York City public high schools (Britton et al., 2019). The CN Central Office oversees the 18 college programs with campus teams (directors and liaisons) responsible for program partnerships and implementation (Britton et al., 2019). CN’s public high school partners receive support through “professional development for instructors and curriculum development” (Britton et al., 2019, pp. 6–7).

As noted by Britton et al. (2019), the CN study used “a quasi-experimental regression discontinuity design that compares outcomes for students who just met the criteria for CN with the outcomes for students who just missed the benchmark score for college credit course enrollment” (pp. 4–5). For the participation sample, CN used the “2016 cohort of on-time high school graduates (i.e., completed grades nine to 12 in four years),” students were enrolled in grades 11 and 12 during the 2014-2015 and 2015-2016 school years (Britton et al., 2019, pp. 4–5). The CN study found that being eligible for

CN leads to a 7% increase in the likelihood of college enrollment (73% compared to 63%) and an 8.6% increase in the likelihood of enrollment in a four-year college (Britton et al., 2019). Students eligible for CN and enrolled in CN were 20% more likely to enroll in college (Britton et al., 2019).

Similar to early college, dual enrollment is a growing college model that builds capacity across high school teaching staff and promotes college access in dual enrollment programs (Cassidy et al., 2010). Dual enrollment programs typically enroll high school students from grades 10 through 12 in college courses within the high school. Courses are taken with peers, and upon successful completion, students receive college credit (Bailey et al., 2003; Cassidy et al., 2010). Successful completion is usually measured by end-of-course exams or assigned letter grades (Cassidy et al., 2010). Dual enrollment programs require "a partnership between school or district and a local institution of higher education," and earned credit is documented on both high school and college transcripts (Cassidy et al., 2010, p. 1). Due to the breadth of offerings within the high school setting, dual enrollment is increasingly seen as an opportunity to provide equitable college access to historically excluded groups who may not have the financial and transportation resources to take courses outside the high school campus. Rivera, Kotok, and Ashby (2019) noted dual enrollment policies "have the potential for school leaders to create a more equitable pathway, but it also creates a pathway for the already advantaged students to subsidize their post-secondary education, widening the opportunity gap among students" (p. 23).

Dual enrollment widens the opportunity gap among students, but it can also create equity challenges based on social-economic status [SES], the cost of courses, and access to enrollment opportunities. Rivera et al. (2019) noted,

> Our study Access to Dual Enrollment [DE] in the United States suggests a mix of policy goals and outcomes across the United States, but DE tends to benefit the relatively advantaged students. Specifically, we find that higher SES students seem to be more likely to participate in DE. (p. 24)

"Although the magnitude of this difference was not massive, it demonstrates that DE is not necessarily closing the national opportunity gap as promised in the rhetoric" (Klein, 2017, as cited in Rivera et al., 2019, p. 24).

While racial disparities exist in the DE pipeline, most contrasts seem related to achievement and socioeconomic status. Rivera et al. (2019) noted, "these differences seem to be mostly related to being lower-SES and having lower prior achievement since the race/ethnic gap was not statistically significant in the latter logistic models" (p. 24). Still, this finding is critical to policy discussions governing dual enrollment models, equity, and further research to determine the impact and longitudinal benefit for historically excluded students. Rivera et al. (2019) took notice of this intersection of equity and access and hoped "to see an overrepresentation of low-income minority students rather than a continuation of grouping and tracking practices by income and prior achievement, which often result in racial stratification" within dual enrollment models (pp. 23–24).

In Rivera et al. (2019), the three DE trends that were found and presented were "females participate in DE at higher rates than males; socioeconomic status is a strong

predictor of DE participation; and that DE may predominantly be for high achieving students" (p. 25). Based on those three trends, the paper purported, "As investment in DE programs continues to grow under the guise of human capital development, policymakers should engage in cost-benefit analyses, contemplate the opportunity costs involved, and ensure that opportunities are not being hoarded by already advantaged students" (Rivera et al., 2019, p. 25). Rivera et al. (2019) noted that rather than subsidizing DE programs for better-resourced students, resources could be allocated toward upstream measures:

> Since 9th grade GPA and SES seem to be important indicators of participation in DE, it seems that subsidizing these programs has not been effective at closing the gap and improving access for disadvantaged students. Rather than subsidizing DE for students with more affluent backgrounds, a more effective use of resources would be geared towards interventions that seek to close this gap at younger ages. (p. 24)

Another equity perspective Rivera et al. (2019) presented was DE's popularity among higher achieving 9th graders to serve as advanced and more rigorous coursework to replace advanced placement courses. Rivera et al. (2019) found, "The descriptive statistics and model estimations suggest that high achieving students are predominantly participating in DE. Although the GPA requirements can be as low as 2.0 in some states, the participants' ninth-grade GPA around 3.1" (p. 24). The Rivera et al. study also showed that

> GPA averages increase more over the high school years for non-participants than for DE students. In other words, GPA does not seem to change much during the

> high school years. Therefore, high achieving 9th graders will have a clear path to advanced coursework if they decide to take it. (p. 24)

These findings are consistent with DE's roots, which viewed concurrent college enrollment as reserved for high-achieving students as an opportunity to provide a more challenging alternative to regular high school coursework (Bailey et al., 2002). In conclusion, Rivera et al. (2019) noted, "At the least, excellence is being considered in conjunction with equity and maybe limiting opportunities based on implicit biases associated with poverty and race" (Rivera et al., 2019, p. 24). Mehl, Wyner, Barnett, Fink, and Jenkins (2020) shared education leaders must be committed to better preparing historically excluded students for college and careers through dual credit by integrating "intentional investments in staff and resources, shifting mindsets and cultures, and when necessary [*sic*], workarounds to policies and structures that disadvantage certain students" (p. 13).

The focus on equity and improving outcomes for historically excluded students is a vital component of the career academy model, which blends learnings from CTE, EC, and DE (Fletcher & Cox, 2012, p. 4). Two programs highlighting these learnings and shared outcomes are the Concurrent Courses Initiative (CCI), supported by The James Irvine Foundation from 2008 to 2011, and the Oakland Health Pathways Project (OHPP). CCI funded secondary and postsecondary partnerships in California to implement or enhance career-focused dual enrollment programs. OHPP was a joint initiative of Oakland Unified School District, Alameda Health System, and Alameda County Health Career Services Initiative, applying the Linked Learning approach combining real-world

work experience with student services, including CTE, college and career preparation, and dual enrollment programs (Chen et al., 2019).

CCI partnership programs "specifically targeted youth who were low-income, struggling academically, or within populations historically underrepresented in higher education, aiming to improve their high school and college outcomes" (Rodriguez et al., 2012, p. 1). With CCI, "The James Irvine Foundation pursued an approach that combined CTE and dual enrollment," providing support to eight high school and postsecondary partnerships for three academic years, starting in 2008-09 (Rodriguez et al., 2012, p. 2). CCI's network included seven sites during the 2008-09 academic year, with an eighth site beginning in 2009-10. The CCI network focused on various CTE areas, including health, renewable energy, teaching careers, business, and multimedia. According to Edwards, Hughes, and Weisberg (2011), "none of the partnerships were given a script for implementing dual enrollment; they only had to include dual enrollment opportunities within a career-focused pathway linking high school to college, and to provide supplemental supports." These courses could be delivered on the high school or college campus, based on local decision-making (p. 23).

Additionally, "CCI programs also provided supplemental supports, such as college visits and career preparation activities, for participating students" (Rodriguez et al., 2012, p. 2). Overall, the CCI study results showed that "Career focused dual enrollment with supports—as it was implemented across the eight CCI sites—has the potential to promote high school and college success" (Rodriguez et al., 2012, p. 4). Further, CCI dual enrollees had higher high school graduation, persistence in college, and college credit accrual rates than non-participated district peers (Rodriguez et al., 2012).

The CCI dual enrollment data is consistent with a review of research on dual credit using institutional panel data from the Integrated Postsecondary Education Data System (IPEDS) and 2006, 2007, and 2008 incoming freshman cohorts. The review of research from IPEDS found college students who earned dual enrollment credit in high school had "better first-year and overall GPAs, better course sequencing, less major switching, more credits earned in the first year, and shorter times to degree completion" (Myers & Myers, 2017, p. 7).

The OHPP initiative was "designed to improve educational and long-term employment outcomes for youth of color in Oakland" while expanding and diversifying the health workforce—combining college and career preparation, classroom learning, and real-world work experiences (Warner et al., 2020, p. 1). As part of the course offerings, many OHPP schools included dual enrollment courses in partnership with local community colleges; some courses were aligned to the health pathway theme, like medical assisting, psychology, and kinesiology (Chen et al., 2019). OHPP's evaluation documented pathway enrollment between 2014 and 2019 and purported an increase in the number of students from underrepresented groups in health pathways, an increase in self-efficacy and belonging reported by teachers, and "health pathways students significantly outperformed traditional high school students in high school course credits earned and graduation rates" (Chen et al., 2019; Warner et al., 2020, p. 4). In terms of postsecondary transitions, "health pathway students significantly outperformed traditional high school students in a number of college eligibility requirements met and college enrollment" but were "no different in completion of college eligibility requirements and, among those who enrolled in college" (Warner et al., 2020, p. 4). Chen et al. (2019) noted that despite

success in the OHPP model, students still faced barriers such as internship participation, seeing themselves demographically represented in the career options presented, and acquiring personalized support to be successful as they entered college. Still, many programs are unable to account for unobserved characteristics and barriers that many underrepresented students in traditional high schools face—motivation, engagement, and stability of their home environment (Chen et al., 2020). To produce more equitable outcomes, students must have equitable access to learning opportunities, and intentional actions must be taken to remove structural barriers and create additional supports for students with the greatest need (Chen et al., 2019; Chen et al., 2020).

**Career Academies Defined and Historical Perspectives**

Like the comprehensive high school model, the career academies model (also known as career pathways), has broad goals that allow the model to be "both a catalyst for school change, and in some respects, a hostage to schoolwide inertia" (Maxwell & Rubin, 2000, p. 28). Dayton (2010) noted that a career academy is a small learning community (SLC) within a larger high school where the curriculum is focused on careers, college entrance, and partnerships with industry and higher education (p. 5). Partners are invited to serve on a committee, and meetings are scheduled regularly to oversee the SLC student outcomes and create opportunities for students. Advisory committee members help organize industry tours, mentor programs, internships, and dual credit programming for the academy students.

As a catalyst, the SLC focuses on creating a learning community in which teachers develop close relationships with parents/guardians and students (Maxwell & Rubin, 2000). Students in an SLC are organized in cohorts over a two-, three-, or four-

year period taking core and career coursework within the SLC (Maxwell & Rubin, 2000). Depending on the SLC and school size, each SLC is provided an administrator and counselor team who uniquely supports the SLC students and teachers (Maxwell & Rubin, 2000). This model's key features include career exposure, shared planning time for SLC teachers, strong student relationships, and engagement (Dayton, 2010; Fletcher et al., 2019; Hackmann et al., 2018; Maxwell & Rubin, 2000).

According to Dayton (2010), the first career academy was formed in 1969 at Edison High School in Philadelphia. This academy was focused on applied electrical science and was supported by the Philadelphia Electric Company as its industry partner (Dayton, 2010). Nearly 20 years later, during the early 1980s, the first reported academy evaluation occurred in California; it found that academy students, in comparison to similar groups, achieved the following student outcomes: "better attendance, earned more credits, obtained higher grades, and were more likely to graduate" (Reller, 1984 as cited in Dayton, 2010, p. 8). Further studies of the first ten state-funded academies in California showed "substantial and statistically significant advantages for academy students in attendance, credits earned toward graduation, grade point averages, and retention through high school" (Dayton, 2010, p. 8). Also noted in Dayton (2010):

> Academy graduates are more likely to come from high schools with large proportions of low-income minority students. After taking this into account, the academy graduates were less likely to need remedial coursework at the university, and they were more likely to receive their bachelor's degrees, compared to the other graduates from the same district. (p. 9)

Historically, the structure of the career academy includes benchmarks at each grade level that will span career and college exposure with going to college and career sites for visits (Kemple & Snipes, 2000; MDRC, 2013). As students progress, sophomore through senior year, they will participate in job shadowing, mentoring, internships, and project-based instruction (Kemple & Snipes, 2000; MDRC, 2013). Dayton (2010) noted that students in the career academy are exposed to projects that blend academic skills with workforce skills to create relevance to academy learnings. This relevance is often in a framework called "plans of study." Plans of study, also known as career clusters, are based on knowledge, skills, and courses students need to acquire and complete before high school graduation (Dayton, 2010, p. 14). Career clusters can be based on the school's geography and the projected job growth of the region—these plans of study guide instruction and individual goals.

To date, many career pathway programs and academy models are still aligned to the CTE programming with the Departments of Education (USDOE) and Labor (DOL) and embody the CTE approach by fitting occupational course sequences (career clusters) with the academic coursework needed for college (Stern, 2010). Much of this alignment, supported through legislation, occurred in the 1980s and 1990s when vocational education (VE) aligned to direct, full-time work like agriculture and manufacturing began to shift to CTE (Malkus, 2019; Stern, 2010). Comparative to VE, CTE intended to prepare students for college and careers with concentrations in new occupational avenues like computer science and healthcare (Malkus, 2019; Stern, 2010). The first legislation tied to VE was the Smith-Hughes Act of 1917, which provided federal support for programs teaching agriculture, trades, and home economics (Malkus, 2019; Stern, 2010).

The Smith-Hughes Act was explicitly designed to create separate vocational tracks for semiskilled labor workers educated at a level lower than college grade (Malkus, 2019; Stern, 2010). Rebranding CTE from VE was solidified with the Carl D. Perkins Vocational and Applied Technology Education Act Amendments of 1990 (Perkins II), embracing more alignment to secondary and postsecondary paths of students, academic offerings, and workforce needs (Malkus, 2019). As CTE gained more popularity, the passage of Perkins IV in 2006 formally replaced the outdated VE term with CTE and a renewed purpose of developing academic, career, and technical skill sets for secondary and postsecondary students (Malkus, 2019).

Career Academies and CTE programming have similar frameworks—cohorts, courses of study, and student profiles. According to Cox, Hernández-Gantes, and Fletcher (2015), "students who enrolled in CTE coursework as part of their middle school experience were also more likely to enroll in a career academy as part of their high school experience in general," further hypothesizing that a student's decision to enroll in a career academy and CTE models may be attributed to early exposure to career awareness and prior learning programs in middle school (Cox et al., 2015, p. 24).

Further demonstrating alignment between CTE and career academies, the Workforce Innovation and Opportunity Act (2014) defines Career Pathways Definition as follows:

> (7) Career pathway
>
> The term "career pathway" means a combination of rigorous and high-quality education, training, and other services that—

(A) aligns with the skill needs of industries in the economy of the State or regional economy involved;

(B) prepares an individual to be successful in any of a full range of secondary or postsecondary education options, including apprenticeships registered under the Act of August 16, 1937 (commonly known as the "National Apprenticeship Act" 50 Stat. 664, chapter 663; 29 U.S.C. 50 et seq.) (referred to individually in this Act as an "apprenticeship," except in section 3226 of this title);

(C) includes counseling to support an individual in achieving the individual's education and career goals;

(D) includes, as appropriate, education offered concurrently with and in the same context as workforce preparation activities and training for a specific occupation or occupational cluster;

(E) organizes education, training, and other services to meet the particular needs of an individual in a manner that accelerates the educational and career advancement of the individual to the extent practicable;

(F) enables an individual to attain a secondary school diploma or its recognized equivalent, and at least 1 recognized postsecondary credential; and

(G) helps an individual enter or advance within a specific occupation or occupational cluster. (29 U.S.C. § 32-3102, Lines 7 A-G)

According to the USDOE, CTE provides an essential pathway for students to explore interests and personalize their education plans for current and emerging professions. Further, the USDOE (2019) notes that:

> At the high school level, CTE provides students with opportunities to explore a career theme of interest while learning a set of technical and employability skills that integrate into or complement their academic studies. High school CTE is meant to connect with and lead to postsecondary programs of study or additional training after high school, which may include more specialized technical instruction. These pathways can culminate in postsecondary degrees or certificates, apprenticeships, or employment. (para. 1)

The USDOE definition aligns with Jenkins's (2006) definition as a "particular framework or approach by which regions can better align publicly supported systems and programs to build a knowledge economy workforce customized to the needs of local labor markets" (p. 6). Likewise, the DOL relates to Jenkins's (2006) definition that a career pathway is a "series of connected education and training programs and support services that enable individuals to secure employment within a specific industry or occupational sector and to advance over time to successively higher levels of education and employment in that sector" (p. 6). Each component of that framework is intentionally designed to better prepare students for the next level of employment and education, including an entry-level position with a stackable credential or a portion of their requirements satisfied toward a degree. Effective CTE and career pathway programs "target jobs in industries of importance to local economies" and are "designed to create both avenues of advancement for current workers, jobseekers and new and future labor market entrants and a supply of qualified workers for local employers" (Jenkins, 2006, p. 6). To this end, CTE serves "as a strategy for strengthening the "supply chains" that produce and keep a region's knowledge workforce up to date" (Jenkins, 2006, p. 6.).

The framework for CTE career pathways and academies was defined by three federal departments (USDOE, Health and Human Services, and Labor) who issued a joint commitment in 2012 to use Career Pathways as a strategy to help youth and adults "acquire marketable skills and industry recognized credentials" (Office of Family Assistance, 2012, para. 1). The Departments also included the following definition and elements of successful Career Pathways systems and implementation: Career Pathways are a "series of connected education and training strategies and support services that enable individuals to secure industry-relevant certification and obtain employment within an occupation area and to advance to higher levels of future education and employment in that area" (Office of Family Assistance, 2012, para. 4). Per the Departments, the essential components of a career pathway include:

> Alignment of secondary and postsecondary education with workforce development systems and human services;
>
> Rigorous, sequential, connected, and efficient curricula, that "bridges" courses to connect basic education and skills training and integrate education and training;
>
> Multiple entry and exit points;
>
> Comprehensive support services, including career counseling, child care [*sic*] and transportation;
>
> Financial supports or flexibility to accommodate the demands of the labor market in order to allow individuals to meet their ongoing financial needs and obligations;

> Specific focus on local workforce needs, aligned with the skill needs of targeted industry sectors important to local, regional or state economies, and reflective of the active engagement of employers;
>
> Curriculum and instructional strategies appropriate for adults that make work a central context for learning and work readiness skills;
>
> Credit for prior learning and other strategies that accelerate the educational and career advancement of the participant;
>
> Organized services to meet the particular needs of adults, including accommodating work schedules with flexible and non-semester-based scheduling, alternative class times and locations, and the innovative use of technology;
>
> Services that have among their goals a focus on secondary and postsecondary industry recognized credentials, sector specific employment, and advancement over time in education and employment within a sector; and,
>
> Is founded upon and managed through a collaborative partnership among workforce, education, human service agencies, business, and other community stakeholders. (Office of Family Assistance, 2012, pp. 1-2)

The institution and scalability of CTE programs are evidenced by the number of CTE programs across the country, with "Almost all public school [*sic*] districts (98 percent)" offering CTE programs to high school students during the 2016-17 school year (USDOE, 2019, para. 10). The impact of career pathway models through data presented from the Department of Education CTE programs showed the following:

- 9th-grade public high school students in 2009 who were CTE concentrators (94%) graduated from high school at higher rates than their non-concentrator peer (86%). (USDOE, 2019, para. 12)
- CTE concentrators who graduated high school by expected graduation year 94%; by three years after expected graduation year 98%. (USDOE, 2019, para. 12)
- Non-CTE concentrators who graduated high school by expected graduation year 86%; by three years after expected graduation year 92%. (USDOE, 2019, para. 12)
- 10th-grade public high school students in 2002 who were CTE concentrators (72%) enrolled in postsecondary education within eight years of their expected high school graduation at slightly higher rates than non concentrators [*sic*] (70%). (USDOE, 2019, para. 13)

Still, despite the representation of positive impact and historical significance of being one of the oldest and most widely established high school reforms, career academies are not offered to every public school student (Hemelt et al., 2019; Kemple & Snipes, 2000). Moreover, the lack of school-wide implementation and reliable studies on academies' effectiveness for different groups across a broad cross-section of students are limited (Hemelt et al., 2019; Kemple & Snipes, 2000; Maxwell & Rubin, 2000).

**Career Academies' Impact on High School Participants**

A study of the Career Academy structure found that academy students have significantly higher cognitive and emotional engagement levels than their peers in comprehensive school settings (Fletcher et al., 2019). Fletcher et al. (2019) defined

cognitive engagement as “a student’s psychological investment in learning and the utilization of self-regulation techniques” (p. 152). This could include the student’s attendance in school, assignments, and homework, class-related activities and discussions, and participation in extracurricular activities. For the purposes of their study, emotional engagement was defined as “emotions, interests, perceptions, and dispositions toward schooling,” as identified by forming a sense of belonging and setting aspirations toward schooling (Fletcher et al., 2019, p. 152). Based on Fletcher et al.’s (2019) findings, participation in the academy model was found to have the “potential to increase high school students’ levels of cognitive and emotional engagement, particularly those from underrepresented and ethnically and racially diverse backgrounds” (p. 144).

Similarly, Kautz, Heckman, Diris, ter Weel, and Borghans (2014) and Lanford and Maruco (2018) suggested the effectiveness of Career Academies may relate to the academies’ ability to improve students’ non-cognitive skills—lauding internships, amplified teacher involvement, personalized support, and other related real-world experiences offered during the Academy structures as motivation to learn and acclimate to the world of work. Compared to comprehensive high schools, Career Academies expose students to career-oriented activities, including job shadowing, career fairs, resume writing, and interview preparation. These environments encourage students to work together to achieve success and project completion. This motivation to learn and increased engagement also drives attendance. “When asked about their interest and attendance patterns in school, most participants stated that they became more interested in school due to being enrolled in the career academy and attended school 75% of the time or more” (Bernard, 2021, p. 65). Kautz et al. (2014) noted, “Programs that integrate

school and work not only motivate students to learn relevant academic material but also integrate adolescents into the larger society and teach children the skills valued in the workplace and in society at large" (p. 65).

Further, Kautz et al. (2014) found, "Non-cognitive skills predict later-life outcomes with the same, or greater, strength as measures of cognition. They have strong effects on educational attainment but have additional effects on important life outcomes beyond their effects on schooling" (p. 81). Regarding academic performance, the literature review for this study yields two previous studies focused on students' academic performance conducted by Maxwell and Rubin in 2001 and Rodriguez in 2020. Maxwell and Rubin (2001) have shown that the career academy increased academic knowledge and skills, evidenced by an increase in grade points for many student groups, especially in terms of a D/D+ average to a C average (pp. 2–3). Maxwell and Rubin (2001) noted, "Even though the average is still low and is hardly an indicator of postsecondary success, the increase suggests that the career academy increased the knowledge and skills that students took away from school" (p. 2). Additionally, the career academy helped improve high school persistence and graduation rates and found "students who were not in academies had dropout rates that were over two times higher than those for students in career academies" (Maxwell & Rubin, 2001, pp. 2–3).

Maxwell and Rubin (2001) also reported, "Approximately two years after leaving high school, more than 92 percent of former academy students had a high school diploma or equivalent, compared with 82 percent of students from other programs" (p. 4). However, their "multivariate analysis showed that the career academy increased graduation rates for academy students only by building their academic knowledge and

skills" (Maxwell & Rubin, 2001, p. 4). The Maxwell and Rubin (2001) study inferred that "academy enrollment increased high school GPA, which in turn increased the probability of graduating" (pp. 2–3).

Similarly, Rodriguez (2020) found that the career academy model positively affected student academic performance as determined by student math and ELA state test scores (pp. 4-5). In their study, Rodriguez (2020) reported a 30.35-point higher average on the 10th grade ELA and a 14.82 higher average for 10th grade math scores for academy students than non-academy students when controlling for previous academic performance (p. 93). This study found that the career academy model "can be an effective model in facilitating students' success in the area of student achievement, particularly for students from low-income backgrounds" (p. 96). Additionally, it found that career academy implementation can address many challenges large comprehensive schools face to make learning more meaningful and should be considered an effective reform model.

Conversely, Kemple and Snipes (2000) reported that career academies did not improve student achievement "as measured by the standardized math and reading tests" (p. ES-23). Their study noted career academies face the same challenges as other high schools regarding academic curricula, instructional strategies, and ensuring support for teachers and students to meet specified learning objectives. Although career academies increase engagement, it simply is not "sufficient to improve student achievement" (Kemple & Snipes, 2000, p. ES-23). Kemple and Snipes (2000) reviewed standardized achievement tests for 490 students in their sample. They noted, "Although impacts on test scores followed trends found for other outcomes, such as academic course-taking, there was no clear pattern of increases or decreases" (p. ES-15).

Previous studies of the career academy and CTE structures reported positive outcome indicators of the models' combined impact on exposing students to careers, creating relevance in learning by aligning career and technical curriculum to industry standards, and encouraging students to complete high school and earn better GPAs. Studies by Maxwell and Rubin (2000), Kemple and Snipes (2000), Hazel (2005), Dayton (2010), Stern et al. (2010), Haick (2010), Lanford and Maruco (2018), and Rodriguez (2020) found positive relationships between career academy participation and exposure, relevance, engagement, personalized academic support, and academic achievement. The career academy structure transforms comprehensive high schools, and there are many federally funded initiatives providing robust research and overviews of career academy and CTE models as successful school reform initiatives (USDOE, 2015; USDOE, 2019; USDOL, 2014).

**Career Academies' Impact on Postsecondary Entry**

Studies have shown that dual enrollment, career programming, and the career academy model can promote postsecondary success (Hemelt et al., 2019; Kemple, 2001). Maxwell and Rubin's (2001) study found, "Former academy students were more likely than their counterparts to attend postsecondary education" with the "magnitude of the difference" depending on whether the student was attending a "two- or a four-year institution" (p. 4). When attendance rates at community colleges and four-year institutions were aggregated, "only about a 10% difference existed between academy and nonacademy [*sic*] students" (Maxwell & Rubin, 2001, p. 4). The study further found, "Most career academies did not independently increase the probability of attending college. Instead, they increased the probability of attending a four-year college by

building academic knowledge in high school, which increased postsecondary education" (Maxwell & Rubin, 2001, p. 4).

Castellano et al. (2007) organized a five-year longitudinal study to examine the effect of career-based comprehensive school reform models or career academies on preparing youth for postsecondary education and careers at three high school programs. Their study measured high school engagement, achievement, and the transition to postsecondary and a career (Castellano et al., 2007). In the Castellano et al. (2007) study, high school engagement and achievement were measured using attendance, dropout, course-taking, and graduation rates. High school transition data was achieved through qualitative surveys, preparation, course enrollment, dual credit course taking, and college achievement data. Castellano et al. (2007) reported positive outcomes with CTE investments by noting that "the odds of dropping out of high school declined as the proportion of the high school experience invested in CTE courses increased" (p. 135).

Castellano et al. (2007) also found that more students reported having a post-high school plan than their comparison counterparts, and many students (41% to 62%) remained in their course of study after the transition to postsecondary education. Although Castellano et al. (2007) found neutral effects of career-based comprehensive reform efforts on engagement, achievement, and transition of traditionally underserved students, their report noted other positive impacts. Castellano et al. (2007) found that career-based reforms provide students with opportunities to explore careers and give greater coherence, which improves focus and competence.

Hemelt, Lenard, and Paeplow (2019) found that not only do career academies serve an increasingly wide range of students but enrollment in a career academy increases

the rate of college enrollment for males but not females. Their study noted that in terms of college enrollment, career academy participation increased the likelihood of college attendance within one year of on-time, expected high school graduation for males at an 8.5 percentage point advantage compared to a male counterpart who did not enroll in an academy. Hemelt et al. (2019) suggested that the stated effect of academy enrollment on college entry operates through a "change in students' propensity to attend college than through an increase in the opportunity to attend college" (p. 174).

The literature review conducted for this study yielded four related studies on career academies' impact on participants' postsecondary entry; none of the studies found were published after 2019.

**Career Academies Impact on Participants' Postsecondary Persistence and Completion**

Though there have been prior studies on postsecondary entry (Maxwell, 2001; Maxwell & Rubin, 2002; Orr et al., 2003; Stern et al., 2010), it was even more challenging to date to find the breadth and depth of studies focusing on the impact of career academies on postsecondary persistence and completion than postsecondary entry. Supporting this assertion, Visher and Stern (2015) noted:

> Despite the array of programs now operating in many cities and states, surprisingly little is known about the effectiveness of most of these in making a real difference in the lives of students who participate in them. Most research on these programs lacks the rigor needed to attribute with confidence any improvement in outcomes to the program itself, rather than to the characteristics

> of students who choose to enroll. There are a few notable exceptions to this pattern. (p. 11)

Maxwell (1999) asserted that as an educational reform, the "long-term consequences of the reforms [career academy] are unknown" (p. 1). Further, "Career academies have not yet been the explicit focus of research efforts that examine postsecondary educational outcomes" (Maxwell, 1999, p. 3).

Focusing on the impact on postsecondary enrollment, persistence, and completion, the USDOE reported: "High school students who were CTE concentrators were more likely than non-concentrators to earn an associate's degree as their highest level of educational attainment within eight years of their expected high school graduation" (USDOE, 2019, para. 14). Additionally, "High school students who were CTE concentrators [72%] were employed full-time at higher rates eight years after their expected high school graduation compared to non-concentrators [67%]" in comparing 2002 CTE students to 2012 employment (USDOE, 2019, paras. 17–18). In their longitudinal study, the USDOE found that "Eight years after their expected high school graduation, the median annual earnings for CTE concentrators [$23,950] were higher for non-concentrators [$20,015]" in comparing 2002 CTE students to 2012 median annual earnings (USDOE, 2019, para. 19).

Similarly, Morgan, Zakhem, and Cooper (2018) found in terms of immediate college enrollment, persistence, and graduation (completion), there is a "positive relationship between college preparatory coursework participation in high school and college enrollment, persistence, and graduation" (p. 16). This study defined college preparatory coursework as participation in Advancement Via Individual Determination

(AVID) courses, concurrent enrollment (dual credit/dual enrollment) courses, CTE courses, honors courses, and AP courses (Morgan et al., 2018). Morgan et al. (2018) noted the difference in student demographics was not significant in terms of gender, socioeconomic status, and race/ethnicity; therefore, their data support the notation that college preparation coursework is effective in reducing "disparate and adverse outcomes for students who are traditionally under-represented in postsecondary educational setting" (p. 15). Their study also found:

> Students who complete the FAFSA have a greater chance of being immediately enrolled after high school. Students immediately enrolled after high school increased their probability of persisting in college through the second year. Students who persist through the second year increase their probability of graduating. (Morgan et al., 2018, p. 15)

As reported by the National Skills Coalition, the Arkansas Center Pathways Initiative (CPI) provides work-based learning and the completion of a degree or certificate program by combining "skills instruction and postsecondary training" with critical supports for advising, tuition, transportation, and testing fees (National Skills Coalition, 2017, p. 5). According to the National Skills Coalition, CPI is a state case study for successful career pathways and academy structures. As reported by the National Skills Coalition (2017), CPI outcomes are favorable for increased college persistence and completion rates between 2006 and 2013, "52 percent of CPI participants completed at least one postsecondary credential compared to 24 percent of non-CPI community college students statewide" (p. 5). Of note, CPI's historically excluded students also exhibited improved postsecondary outcomes (National Skills Coalition, 2017). As

reported, “African-American CPI students are three times as likely and Hispanic students four times as likely as their non-CPI community college student counterparts to earn a postsecondary credential” (National Skills Coalition, 2017, p. 5).

Kemple and Scott-Clayton (2004), in a report to the MDRC, examined the impact that Career Academies have on educational attainment and postsecondary labor market experiences for participants three to four years following high school graduation. This study collected survey data from 1,458 graduates, with around 85% of the sample size reported as Hispanic or African-American (Black). This study found career academy participation produced positive and sustained impacts within labor market outcomes, as evidenced by career academy participants earning 18% more than non-academy participants’ average monthly earnings. This report also indicated that career academies produce substantial increases in employment and wages for students at the highest risk of dropping out, evidenced by a reported 16% increased earnings over non-academy participants in a similar risk subgroup (p. ES-4). In terms of educational attainment, Kemple and Scott-Clayton (2004) and Kemple and Willner (2008) found no statistically significant difference or outcomes between treatment and control groups. However, high school completion and postsecondary enrollment rates were higher than the national averages (Kemple & Scott-Clayton, 2004; Kemple & Willner, 2008). Kemple and Scott-Clayton (2004) found by the end of the four-year post-high school surveying period, over half of the participants, both in the Academy and non-Academy groups, “had either completed a post-secondary credential (a bachelor’s degree, an associate’s degree, or a training license or certificate) or were still working toward a credential” (p. ES-5).

Kemple's (2001) findings similarly suggested that although career academy participation enhances the high school experience, those effects did not translate to sweeping impacts on initial transitions to postsecondary education. The study found that those of the "non-Academy group" matched the "Academy's group's relatively high outcome levels in terms of initial postsecondary education (p. iii.). Kemple (2001) showed that relative to national rates, both academy and non-academy groups exhibited elevated high school graduation rates, college enrollment, and enrollment. Kemple's (2001) study suggested that career academies should recruit students who may not be motivated to participate in academies and who could significantly benefit from engagement.

Maxwell's 2001 study and Maxwell and Rubin's 2001 and 2002 studies determined other measures of postsecondary outcomes. Maxwell's (2001) study examined a high school career academy's influence on participants' exiting a four-year comprehensive, urban university. Data in the 2002 study were drawn from students coming from a single high school district who participated in a strong career academy program. The findings suggested that career academy students have higher academic achievement upon leaving high school, less need for remediation in English during college, and experienced increased college completion rates than students who did not participate in a high school academy.

Maxwell and Rubin's (2002) study reviewed the potential of career academies to improve the postsecondary experience of students in traditional curriculum programs. In their research, Maxwell and Rubin compared data for students by "analyzing both a detailed data set that contains post-secondary information for general, academic,

vocational and career academy students from a single school district and the urban, public school students in the National Education Longitudinal Study (NELS)," which showed "students from career academies attend two- and four-year colleges at the same level as students describing themselves as having had an academic track program" (p. 138). Maxwell and Rubin (2002) noted that "Because career academies often draw students from backgrounds that typically define them as "at-risk" of school failure, these gains are realized for individuals who are often considered less likely to achieve post-secondary success" (p. 138). Further, in their study, students who enrolled in the career academy program were found to be less academically prepared when they entered high school as compared to students from the general or traditional programs. Their results show the career academy model has the potential for increasing education levels for participants, "the "average" career academy student has…an 11.6 percentage point increase in attending a two- or four-year post-secondary institution, and a 17.9 percentage point increase in attending a four-year post-secondary institution" (p. 145).

To assess the NAF career academy model's impact, the Institute on Education and the Economy conducted an evaluation spring of 2000-2001 across multiple sites (Orr et al., 2003). The study, which compiled survey and transcript data for 199 career academy seniors, compared them to 190 graduating non-academy seniors. The study also drew 157 alumni from nine NAF-affiliated career academy teachers, non-academy teachers, and employers. Orr, Hughes, and Karp (2003) reported the NAF-affiliated career academies "positively impacted students' postsecondary transitions" as measured by their college enrollment, completion, improved career aspirations, and employment outcomes (p. 3).

Orr et al. (2003) noted by graduation, 77% of the academy seniors, compared to 64% of the comparison seniors, had already been accepted into colleges and planned to attend. The program alumni also exhibited successful outcomes, as evidenced by the postsecondary completion data. According to Orr et al. (2003), program alumni completed two-year or four-year college degrees within five to ten years after high school graduation—52% of the ten-year alumni and 44% of the five-year alumni completed a four-year degree. Additionally, 45% of those with either two or four-year degrees earned a degree in an academy-related industry (Orr et al., 2003). This study suggests positive postsecondary outcomes exist for students attending academies regarding postsecondary attainment and career aspirations aligned to their academy experience. Despite an array of programs operating in many regions, little is known about the effectiveness of Academy programs and the real-life impact on the lives of participants (Orr et al., 2003). However, most research on Academy programs can lack the rigor needed to assert with confidence any improvement in the program's outcomes rather than the individual characteristics of students choosing to enroll (Vishner & Stern, 2015).

**Summary**

Research shows that Career Academies have served as a viable pathway for their participants, presenting a range of postsecondary education and career opportunities. Prior research has provided support that there is a relationship between career academy participation and increased student engagement, attendance, immediate college enrollment, postsecondary attainment, and improved median outcomes (Castello, 2007; Hemelt et al., 2019; Kemple et al., 2004; Lanford & Maruco, 2018; Maxwell & Rubin, 2001; Morgan et al., 2018; USDOE, 2019). However, sweeping impacts on

postsecondary transitions and systemic effects on educational attainment have been questioned, as well as the Career Academies' ability to improve postsecondary education for all demographic groups compared to other non-Academy options, especially for females, African Americans, and Latinx students (Cox et al., 2015; Hemelt et al., 2019; Kemple & Willner, 2008; Maxwell et al., 2001). To date, academic research is limited in firmly establishing a relationship between career academy participation and postsecondary enrollment, persistence, and completion.

Chapter 3 provides the research methods used in the current study, including the research design, selection of participants, measurement, data collection procedures, data analysis, hypothesis testing, and study limitations.

# Chapter 3

## Methods

The primary goal of this study was to explore the impact of USI's Career Academy by examining the post-high school graduation success of Health Academy participants as compared to demographically matched students at the following intervals: year-one, year-two, and year-six. As stated in Chapter 1, post-high school graduation success was defined by their entry, persistence, and completion of a postsecondary program (2-year, 4-year, and certification). This chapter focuses on methodology and is organized into the following sections: research design, selection of participants, measurement, data collection procedures, data analysis, hypothesis testing, and study limitations.

### Research Design

This study utilized a nonexperimental, quantitative research design using causal-comparative methods, which intended to compare "two or more groups in terms of a cause (or independent variable) that has already happened" (Creswell, 2014, p. 12). This study examined the relationship between USI's career academy participation and success post-high school graduation for Health Academy participants. The independent variable was USI Health Academy participation status (categorical variable) with two categories, students who opted into USI's Health Academy (participated) and students who did not opt into USI's Health Academy (non-participated). The three dependent variables (DVs) were postsecondary success, including enrollment, persistence, and completion. The DVs were all categorical variables, with two categories indicating the specific status. More specifically, for enrollment, the two categories were enrolled and not enrolled; for

persistence, the two categories were persisted and not persisted; and for completion, the two categories were completion and no completion.

**Selection of Participants**

The target population of this study included two groups, participated students and non-participated demographically matched students, as a comparison group. Participated students attended one of USI's 16 partner high schools and enrolled in USI's health-themed academy. Non-participated demographically matched students also attended one of the 16 partner high schools, but they did not enroll in USI's health-themed academy. USI's 16 partner high schools have high populations of historically excluded and racially and ethnically minoritized students (61-100% low-income and 40-99% Students of Color). USI partner schools all fall in a 90% free or reduced lunch status category and are similar in demographics (i.e., age, race, and socioeconomic status).

The total number of students served through USI's academies across the following academy career areas: business and finance, design, engineering, health, supply chain, and technology) from 2010 to 2019 was 853. Purposive sampling was used to select participated students since it provided a means to examine postsecondary enrollment data based on the "researcher's experience or knowledge of the group" (Lunenburg & Irby, 2008, p. 175). Eligible participated students were identified through the USI Data Dashboard using the following criteria: health academy participation, participation length (one semester or more), and graduation year eligibility between 2011 to 2019. Three hundred thirty-seven participated students were included in the study.

Eligible non-participated students were identified through the USI data agreements from their 16 partner high schools for the graduation years of 2011 to 2019

and were obtained by USI. Data were compiled for all eligible non-participated students, and the combined data across USI school partners totaled 30,000 students. A stratified random sampling method was used to select non-participated students, and a total of 226 non-participated students were selected based on graduation year compared to the participated group defined above. For example, for the 2017 graduation year, five to six participated students were identified; therefore, five to six non-participated students were randomly selected from the same graduation year as the comparison group. Lunenburg and Irby (2008) defined stratified random sampling as "the process of selecting a sample in such a way that identified subgroups in the population are represented in the sample in the same proportion that they exist in the population" (p. 171).

## Measurement

**Academy Participation.** Participation was measured as categorical with two categories: participated or non-participated in USI's Health Academy. Academy participation data were retrieved from archived institutional data maintained as a data dashboard by USI and two master spreadsheets for the institution titled "NSC-Academy Master" and "Randomized Students." Students listed on the "NSC-Academy Master" include participated academy enrolled students by school enrollment, type, academy participation, academy participation length, postsecondary enrollment, postsecondary persistence, postsecondary completion, and other collected USI institutional data. Non-participated students listed on the "Randomized Students" include non-participated students enrolled by school enrollment, postsecondary enrollment, postsecondary persistence, postsecondary completion, and other collected USI institutional data.

Academy participation status for each participant is also identified in the "NSC-Academy Master" spreadsheet as "ever enrolled" and indicated as "1" for yes and "0" for no.

According to Lunenburg and Irby (2008), validity is the "degree to which an instrument measures what it purports to measure" (p. 181). Validity for academy participation was established using USI's definition of academy participation based on institution standards of the length of academy enrollment at one semester or more (USI, 2018).

Lunenburg and Irby (2008) defined reliability as the "degree to which an instrument consistently measures whatever it is measuring" (p. 182). Reliability for academy participation was documented using USI's participation and engagement records for Academy-related college and career experiences (e.g., academy participation, dual credit enrollment, and credential enrollment). USI administrators ensured these records were appropriately and consistently updated each semester in the USI Data Dashboard.

**Enrollment**. Enrollment was measured by enrollment in a postsecondary program as categorical with two categories: students either enrolled in a postsecondary program up to one year following high school graduation or not enrolled. Postsecondary enrollment for this study was retrieved from archived institutional data maintained in a data dashboard by USI and two master spreadsheets for the institution titled "NSC-Academy Master" and "Randomized Students," as listed above for academy participation. Enrollment status was identified in the two spreadsheets by corresponding semester and year of enrollment indicated with a "yes" or "no" for enrolled. Enrollment by type of postsecondary institution was also indicated by the institution's two-year and four-year

degree-granting status. Archived postsecondary enrollment data for participated and non-participated students were drawn from NSC through USI's StudentTracker membership. Validity for postsecondary enrollment was established using USI's Data Dashboard, which tracks postsecondary enrollment based on reporting from NSC. The system was maintained for the length of this study. Reliability for enrollment was established by utilizing the defined procedure and guidelines for postsecondary enrollment as NSC.

**Persistence**. Persistence was measured by enrollment from the first to the second year of postsecondary programming (fall to fall) as categorical with two categories: students either persisted to the next academic year of postsecondary or not persisted to the next academic year at an institution. Postsecondary data for this study were retrieved from archived institutional data maintained in a data dashboard by USI and two master spreadsheets for the institution titled "NSC-Academy Master" and "Randomized Students," as listed above, for academy participation. Persistence status was identified in the two spreadsheets by corresponding semester and year of enrollment indicated with a "1" (enrolled) or "0" (not enrolled). Archived postsecondary persistence data for participated and non-participated students were drawn from NSC through USI's StudentTracker membership. Validity for academy persistence was established using USI's Data Dashboard, which records postsecondary persistence based on reporting from NSC on postsecondary persistence. The system was maintained for the length of this study. Reliability for persistence was established by utilizing the defined procedure and guidelines for postsecondary persistence as NSC.

**Completion**. Completion was measured by degree completion from a 2-year, 4-year, postsecondary, or certification program within six years after high school

completion as categorical with two categories: students either completed a degree or not completed a degree from an institution within six years. Postsecondary completion data for this study were retrieved from archived institutional data maintained in a data dashboard USI and two master spreadsheets for the institution titled “NSC-Academy Master” and “Randomized Students,” as listed above for academy participation. Completion status was identified in the two spreadsheets as “degree obtained,” indicated with a “yes” and corresponding degree type, institution, and year obtained. Archived postsecondary completion data for participated and non-participated students were drawn from NSC through USI’s StudentTracker membership. Validity for academy completion was established using USI’s Data Dashboard, which records postsecondary completion based on reporting from NSC on postsecondary completion. The system was maintained for the length of this study. Reliability for completion was established by utilizing the defined procedure and guidelines for postsecondary completion as NSC.

**Data Collection Procedures**

A request for permission to utilize USI’s archival data was submitted to USI’s executive leadership team on December 16, 2020 (see Appendix C). USI granted the use of the archived NSC data on December 16, 2020 (see Appendix D). Prior to data collection, a request for permission to conduct research was submitted to the Institutional Review Board (IRB) of Baker University on September 16, 2022. Pending approval was granted on September 23, 2022. Archival quantitative data were collected from USI’s Data Dashboard and NSC. NSC data were transferred via Secure File Transfer Protocol (FTP), ensuring safe and secure collection, storage, management, and distribution of secure and sensitive information between USI and NSC using FIPS 140-2 validated AES

encryption (National Student Clearinghouse, 2022). Privacy and confidentiality were maintained by replacing health academy student biographical information with randomized identifying numbers assigned by the researcher. For the comparison group of health academy non-participated students, biographical information was replaced with randomized identifying numbers assigned by USI. The data were organized into spreadsheets format and integrated into IBM® SPSS® Statistics Faculty Pack 28 for Windows for statistical analysis.

**Data Analysis and Hypothesis Testing**

The following section includes the three research questions, associated hypotheses, and analyses.

**RQ1.** To what extent does participation in the USI Health Academy have an impact on postsecondary enrollment when compared to non-participated demographically matched students?

***H1.*** Participation in USI's Health Academy has an impact on post-secondary enrollment for academy graduates as compared to non-participated demographically matched students.

A chi-square test of independence was conducted to address RQ1 because the relationship between two categorical variables was analyzed. A (2 x 2) frequency table was constructed for the two categorical variables: academy participation (i.e., participated and not participated) and enrollment (i.e., enrolled in a postsecondary program up to one year following high school graduation and not enrolled). The observed frequencies were compared to those expected by chance. The level of significance was set at .05. An effect size is reported when appropriate.

**RQ2.** To what extent does participation in the USI Health Academy have an impact on postsecondary persistence when compared to non-participated demographically matched students?

***H2.*** Participation in USI's Health Academy has an impact on post-secondary persistence for academy graduates as compared to non-participated demographically matched students.

A chi-square test of independence was conducted to address RQ2 because the relationship between two categorical variables was analyzed. A (2 x 2) frequency table was constructed for the two categorical variables: academy participation (i.e., participated and not participated) and persistence (i.e., persisted to the next academic year of postsecondary program and not persisted). The observed frequencies were compared to those expected by chance. The level of significance was set at .05. An effect size is reported, when appropriate.

**RQ3.** To what extent does participation in the USI Health Academy have an impact on postsecondary completion when compared to non-participated demographically matched students?

***H3.*** Participation in USI's Health Academy has an impact on post-secondary completion for academy graduates as compared to non-participated demographically matched students.

A chi-square test of independence was conducted to address RQ3 because the relationship between two categorical variables was analyzed. A (2 x 2) frequency table was constructed for the two categorical variables: academy participation (i.e., participated and not participated) and completion (i.e., completed a degree and not completed a

degree). The observed frequencies were compared to those expected by chance. The level of significance was set at .05. An effect size is reported, when appropriate.

**Limitations**

Limitations are not under the control of the researcher; limitations may affect the interpretation of findings (Lunenburg & Irby, 2008). This study had the following limitations:

1. The number of students reporting their involvement with USI's career academies has been largely due to recommendations or referrals by a high school instructor, counselor, or administrator. This may pose an issue with controlling for selectivity.
2. Many variables outside of the control of the study may impact student success and achievement measures. These variables may include the school district, classroom size, pedagogy style of instructors, and diversity of course offerings.
3. Collection of missing NSC data from USI career academy alumni and high school graduates may be challenging due to contact information viability. Missing data may reduce the sample size of this study and could affect the representation of the sample.
4. All participants in this study were from USI-partnered schools, and specifically participated students were in the health academy, so the findings may not be generalized to understanding career academy success outcomes in other academies and non-partnering USI urban or suburban schools.

## Summary

Chapter 3 focused on the quantitative research design. Three primary research questions guided the study to examine the impact of career academy participation on postsecondary enrollment, persistence, and completion. This chapter described the methodology of the study, including the research design, selection of participants, measurement, data collection procedures, data analysis, hypothesis testing, and limitations. Chapter 4 presents the results of the data analysis.

# Chapter 4

## Results

This study examined the impact of USI's Health Academy on participants' success post-high school graduation compared to demographically matched students in pursuing postsecondary education (i.e., postsecondary enrollment, persistence, and completion). Chapter 4 includes a presentation of the descriptive statistics and hypothesis testing results.

### Descriptive Statistics

The 543 participants of this study included USI Health Academy participated students ($n$ = 317) and non-participated ($n$ = 226) demographically matched students as a comparison group. All participants attended one of USI's partner high schools and graduated between 2011 and 2019. Detailed descriptive statistics are presented in Table 1.

**Table 1**

***Descriptive Statistics***

| Graduation Year | Non-Participated Frequency | Non-Participated Percent | Participated Frequency | Participated Percent |
|---|---|---|---|---|
| 2011 | 1 | 0.4 | 3 | 0.9 |
| 2012 | 6 | 2.7 | 5 | 1.6 |
| 2013 | 19 | 8.4 | 22 | 6.9 |
| 2014 | 13 | 5.8 | 15 | 4.7 |
| 2015 | 3 | 1.3 | 23 | 7.3 |
| 2016 | 16 | 7.1 | 37 | 11.7 |
| 2017 | 46 | 20.4 | 53 | 16.7 |
| 2018 | 58 | 25.7 | 78 | 24.6 |
| 2019 | 64 | 28.3 | 81 | 25.6 |
| Subtotals | 226 | 100.0 | 317 | 100.0 |
| Total Participants | 543 | Total Percent | 100.0 | |

## Hypothesis Testing

The results of the statistical analyses are included in this section for the study's research questions. All three research questions were analyzed using the chi-square test of independence to examine the impact of USI Health Academy participation on postsecondary outcomes.

**RQ1.** To what extent does participation in the USI Health Academy have an impact on postsecondary enrollment when compared to non-participated demographically matched students?

The results of the chi-square test of independence indicated a statistically significant difference between the observed and expected values, $\chi^2(1) = 164.73$, $p < .001$. The null hypothesis was rejected. See Table 2 for the observed and expected frequencies for all the results.

For non-participated students, the observed frequency ($n = 130$) was higher than the expected frequency ($n = 63.7$) in the not enrolled category, and the observed frequency ($n = 96$) was lower than the expected frequency ($n = 162.3$) in the enrolled category. For participated students, the observed frequency ($n = 23$) was lower than the expected frequency ($n = 89.3$) in the not enrolled category, and the observed frequency ($n = 294$) was higher than the expected frequency ($n = 227.7$) in the enrolled category. The research hypothesis was supported, indicating that USI's Career Academy participation may have a positive impact on postsecondary enrollment in participated students compared to non-participated demographically matched students. The effect size indicated a large effect (Phi = 0.55).

**Table 2**

***Observed and Expected Frequencies for H1, H2, and H3***

| Row Variable | Column Variable | Frequency Observed | Frequency Expected |
|---|---|---|---|
| Postsecondary Enrollment for Non-participated Students | Not Enrolled | 130 | 63.7 |
| | Enrolled | 96 | 162.3 |
| Postsecondary Enrollment for Participated Students | Not Enrolled | 23 | 89.3 |
| | Enrolled | 294 | 227.7 |
| Postsecondary Persistence for Non-participated Students | Not Persisted | 164 | 98.6 |
| | Persisted | 62 | 127.4 |
| Postsecondary Persistence for Participated Students | Not Persisted | 73 | 138.4 |
| | Persisted | 244 | 178.6 |
| Postsecondary Completion for Non-participated Students | Not Completed | 212 | 193.5 |
| | Completed | 14 | 32.5 |
| Postsecondary Completion for Participated Students | Not Completed | 253 | 271.5 |
| | Completed | 64 | 45.5 |

**RQ2.** To what extent does participation in the USI Health Academy have an impact on postsecondary persistence when compared to non-participated demographically matched students?

The results of the chi-square test of independence indicated a statistically significant difference between the observed and expected values, $\chi^2(1) = 131.64$, $p < .001$. The null hypothesis was rejected.

For non-participated students, the observed frequency ($n$ = 164) was higher than the expected frequency ($n$ = 98.6) in the not persisted category, and the observed frequency ($n$ = 62) was lower than the expected frequency ($n$ = 127.4) in the persisted category. For participated students, the observed frequency ($n$ = 73) was lower than the expected frequency ($n$ = 138.4) in the not persisted category, and the observed frequency ($n$ = 244) was higher than the expected frequency ($n$ = 178.6) in the persisted category. The research hypothesis was supported, indicating that USI's Career Academy participation may have a positive impact on postsecondary persistence in participated students compared to non-participated demographically matched students. The effect size indicated a medium to a large effect (Phi = 0.49).

**RQ3.** To what extent does participation in the USI Health Academy have an impact on postsecondary completion when compared to non-participated demographically matched students?

The results of the chi-square test of independence indicated a statistically significant difference between the observed and expected values, $\chi^2(1) = 21.01$, $p < .001$. The null hypothesis was rejected.

For non-participated students, the observed frequency ($n$ = 212) was higher than the expected frequency ($n$ = 193.5) in the not completed category, and the observed frequency ($n$ = 14) was lower than the expected frequency ($n$ = 32.5) in the completed category. For participated students, the observed frequency ($n$ = 253) was lower than the expected frequency ($n$ = 271.5) in the not completed category, and the observed frequency ($n$ = 64) was higher than the expected frequency ($n$ = 45.5) in the completed category. The research hypothesis was supported, indicating that USI's Career Academy

participation may have a positive impact on postsecondary completion in participated students compared to non-participated demographically matched students. The effect size indicated a small effect (Phi = 0.19).

**Summary**

The purpose of this study was to examine the impact of USI Health Academy participation on postsecondary outcomes. The results were consistent across all three hypotheses, and all research hypotheses were supported, indicating that USI's Health Academy participation may positively impact postsecondary enrollment, persistence, and completion for academy participants compared to non-participated demographically matched students.

Chapter 5 of this study includes an overview of the problem, a summary of the purpose statement, research questions, and a review of the methodology. Findings related to the literature reviewed are also discussed. Additionally, Chapter 5 includes recommendations for future research, implications for action, and concluding remarks.

# Chapter 5

## Interpretation and Recommendations

This study intended to examine whether participating in USI's Health Academy had an impact on post-high school graduation success for postsecondary enrollment, persistence, and completion for Academy participants compared to demographically matched non-participated students. Chapter 5 summarizes the study and provides an overview of the problem, a summary of the purpose statement, research questions, and a review of the methodology. Findings related to the literature reviewed in Chapter 2, recommendations for future research, implications for actions, and conclusions are discussed.

### Study Summary

Since their inception in 1969, career academies continue to provide support for high school students toward successfully transitioning from high school to postsecondary education. This study reviewed whether Health Academy participation impacted postsecondary (1) enrollment (fall or first year), (2) persistence (fall-to-fall or three semesters of enrollment), and (3) completion rates (two-year or four-year degree or certification) for participating academy high school students as compared to non-participated students who were demographically matched. This study focused on USI, an urban-serving intermediary in Kansas City, Missouri, and academy participant and non-participant data from its partnering high schools.

**Overview of the problem.** Educational equity is a systemic and complex issue with a disparate impact on diverse and historically excluded students (Mostafa, 2009; Reardon et al., 2019; Shapiro et al., 2013; Shapiro et al., 2017; USGAO, 2020). College-

going trends in urban communities continue to show significant gaps for historically excluded students in academic achievement, postsecondary preparation, and postsecondary completion. Studies have found the career academy model to be effective in improving equitable outcomes for participating students during and after high school in terms of student achievement, attendance, engagement, increased graduation rates, test scores, high school graduation, and college enrollment (Charlton et al., 2013; Hemelt et al., 2019; Kemple, 2001; Kemple & Scott-Clayton, 2004; Kemple & Snipes, 2000; Kemple & Willner, 2008; Stern et al., 2010). Additionally, several studies have touted the impact of career academy participation on students forming a sense of belonging, motivation, confidence, and improved relationships within the school community (Haick, 2010). However, the scope of career academy research is limited regarding career academy participants' postsecondary success for enrollment, persistence, and completion.

**Purpose statement and research questions.** This study aimed to examine the impact of USI's Health Academy on participants by reviewing their success post-high school graduation. For the purposes of this study, success post-high school graduation was equated to postsecondary outcomes—enrollment, persistence, and completion. Three research questions guided this study, examining the impact of participation in the USI Health Academy on postsecondary outcomes compared to non-participated demographically matched students. The first research question examined the extent to which academy participation impacts enrolling into a postsecondary institution (fall or first year). The second research question analyzed the extent to which academy participation impacts persistence in a postsecondary institution (fall-to-fall or three semesters of enrollment). The third question investigated the extent to which academy

participation impacts the completion of a postsecondary degree (two-year or four-year degree or certification).

**Review of the methodology.** This quantitative causal-comparative study used archival data and three dependent variables: postsecondary enrollment, persistence, and completion. Chi-square tests of independence were conducted to measure the impact of academy participation on all three dependent variables. Academy participation data were retrieved from archived institutional data maintained as a data dashboard by USI and NSC. Archival data included participated academy enrolled students by school enrollment, type, academy participation, academy participation length, postsecondary enrollment, postsecondary persistence, postsecondary completion, and other collected USI institutional data. Non-participated student data included school enrollment, postsecondary enrollment, postsecondary persistence, postsecondary completion, and other collected USI institutional data. Postsecondary data for USI were retrieved from NSC and included postsecondary enrollment by college characteristics (code, name, state), college type (two-year, four-year, public, private), enrollment (enrollment start and end date, status, class level, and major), graduation (status, date, degree title, degree major, and college sequence).

**Major findings.** The results of the three analyses were significant; all three hypotheses were supported. Statistically significant results were found with a large effect size for postsecondary enrollment, a medium effect size for postsecondary persistence, and a small effect size for postsecondary completion. Participating in USI's Health Academy significantly impacted academy students' likelihood of entering, persisting, and

completing college with a two-year or four-year degree compared to demographically matched students who decided not to participate in the academy.

**Findings Related to the Literature**

Research suggests that students enrolled in career academies have an increased likelihood of high school graduation, college eligibility, and college enrollment (Hemelt et al., 2019; Maxwell, 2000; Maxwell & Rubin, 2002; Morgan et al., 2018; Orr et al., 2003; Warner et al., 2020). Similar to these results, the current study found that career academy students were more likely to enroll in college in comparison to their non-participated peers. The career academy model provides increased alignment between academic standards and workforce skills, thereby creating motivational and educational aspects that allow students to succeed (Orr et al., 2003). Hemelt et al. (2019) noted that key elements of the career academies, including paid internships, cohorting (e.g., SLC), and shared planning time for teachers may lead to these positive results in students for improved high school graduation rates and college-going. There is a consistent positive relationship between career academy participation and engagement in school among students through forming a sense of community, participating in experiential learning opportunities, establishing supportive learning environments, and increased clarity around career choices, planning, and preparation (Maxwell, 2000; Maxwell & Rubin, 2002; Orr et al., 2003; Warner et al., 2020). This is noteworthy and may provide context to the career academies' capacity to improve engagement, provide wrap-around support, and drive connections between schoolwork, postsecondary education, and employment to yield successful post-high school outcomes.

Findings from the second research question indicated that Health Academy students were more likely to persist in a postsecondary institution (fall-to-fall or three semesters of enrollment) as compared to non-participated students. This finding was consistent with a limited number of previous studies that reported a positive correlation between career academy participation and college persistence (Maxwell & Rubin, 2002; Morgan et al., 2018; Orr et al., 2003). Persisting through the course of study is an important indicator for successful completion; previous studies found that career academy students are more likely to continue their education than students in general school programs and remain in their course of study after transition to postsecondary education (Castellano et al., 2007; Maxwell & Rubin, 2002).

Findings from the third research question indicated that Health Academy students were more likely to complete a degree program from a postsecondary institution (two-year or four-year degree or certification) as compared to non-participated students. Although prior studies related to this question were limited, the current findings were consistent with previous correlational studies noting that career academy students are more likely to obtain higher levels of education than non-participated students (Maxwell, 2001; Maxwell & Rubin, 2002; Morgan, et al., 2018; Orr et al., 2003). Maxwell (2001) reported a four percent higher graduation rate for career academy graduates as compared to non-participated students. Similarly, the National Skills Coalition (2017) noted career academy participants were more likely to earn a postsecondary credential than non-participated career academy students. These studies suggest distinctive qualities of student engagement, skill development, application, and strong student relationship in career academy and college preparatory programming during high school toward

effectively reducing barriers for traditionally under-represented students (Maxwell, 2001; Morgan et al., 2018). Moreover, career academies increase the educational attainment of at-risk students (Maxwell & Rubin, 2002), which is similar to the samples involved in this study.

Generally speaking, the findings of this study were in line with the existing body of literature, suggesting that health academy participation may be an effective model for improving student academic outcomes (i.e., postsecondary enrollment, persistence, and completion) after high school. Most significantly, this study's findings extend the limited existing literature related to high school health academies' positive impact on participants' postsecondary persistence and completion.

## Conclusions

School districts, schools, and intermediaries' partnership efforts to integrate the career academy as a school design and intervention model have influenced participating students' postsecondary outcomes. The results of the analyses for this study's research questions indicate that students who attended a health career USI academy are more likely to enroll, persist, and complete their degree programs as compared to students who attend the same high school but do not participate in the career academy.

**Implications for action.** The health career academies implemented in partnership with USI during the time of this study have had a positive impact on academy participants' postsecondary enrollment, persistence, and completion. Based on the findings of this study, the following future actions are recommended:

1. The health career academy model improved student postsecondary success outcomes. School districts, schools and intermediaries should continue the

allocation of resources for supporting and expanding the career academy model within the high school setting.

2. The health career academy students attended historically underserved schools and school districts. When implementing health career academy models, educational attainment gaps and resources for historically excluded and underrepresented students should be considered.

**Recommendations for future research.** While the results of this study demonstrate a positive relationship between career academy participation and student outcomes for postsecondary enrollment, persistence, and completion, this impact cannot be attributed to all career academy types. There is a need for further research related to the impact of high school career academies on participants' postsecondary enrollment, persistence, and attainment (outcomes) that need consideration:

- This quantitative study could be replicated for other career-themed academies, such as business and finance, engineering, technology, and design, to explore the impact on career academy participating students' postsecondary outcomes.
- In a qualitative study examine the iterative design nature of career academies (e.g., program components can be redesigned based on a myriad of influences like the cultivation of new partnership agreements, relevant and innovative best practices in college and career theoretical designs, and lessons learned from prior cohorts) and explore the impact of these changes throughout the implementation of career-themed academies.

- In a quantitative study, examine the impact of dual credit/dual enrollment, and credential attainment on career academy participating students' postsecondary outcomes and degree alignment to their academy theme.
- In a qualitative study, examine the impact of experiential learning opportunities such as internships and field experiences at college and career sites on career academy participating students' postsecondary outcomes.
- In a qualitative study, explore the impact of high school career academy support services provided to participants, such as mentoring and tutoring, on career academy participating students' postsecondary outcomes.
- In a quantitative study, explore the relationship between demographic variables such as socio-economic status, race, ethnicity, gender, and high school career academy participants' postsecondary outcomes.
- In a quantitative study, examine the impact of high school career academies participants' postsecondary outcomes by institutional types (i.e., community colleges, four-year public, four-year private).
- Replicate this quantitative study with a variety of high school career academies in different states of the United States to better understand the impact of state policies and/or funding on career academy models.
- Examine the cost-benefit analysis and return on investment of career academies as an at-scale school improvement strategy for postsecondary outcomes in terms of teacher training, curricula, partnerships, scheduling, dual credit/enrollment, career certification, and experiential activities.

- This study was based on quantitative data; incorporating qualitative data in a mixed methods study to include academy participants, non-participated students, teachers, school administrators, and industry partners, could broaden the scope and provide context for the research. Doing so could reveal the perspectives regarding elements of career academies that those involved believe contribute to postsecondary success in any of the aforementioned future research suggestions.

**Concluding remarks.** This study contributed to the limited research regarding career academies' impact on participating students' postsecondary success outcomes. The results of this study, though limited in scope, provides valuable information about the positive impacts career academies have on participating students' postsecondary enrollment, persistence, and completion. During the Coronavirus pandemic of 2020, race, poverty, education, and opportunity inequities were amplified and widened (Goldhaber et al., 2022). With schools closed for months on end, it became glaringly clear that the educational system in the United States will need innovative and proven solutions to close gaps for the most vulnerable students (Carbonari et al., 2022; Dorn et al., 2020a, 2020b; Goldhaber et al., 2022). The results of this study suggest that career academies are one viable option for addressing the widening educational inequities noted by Goldhaber et al. (2022) and improving postsecondary enrollment, persistence, and completion for historically underrepresented students.

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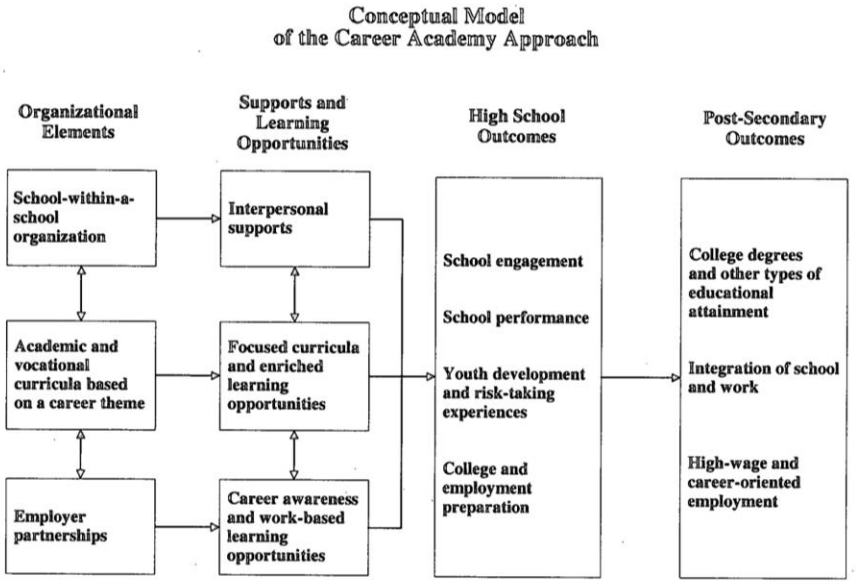
# Appendices

# Appendix A: Conceptual Model of the Career Academy Approach

**Figure 1**

***Conceptual Model of the Career Academy Approach***

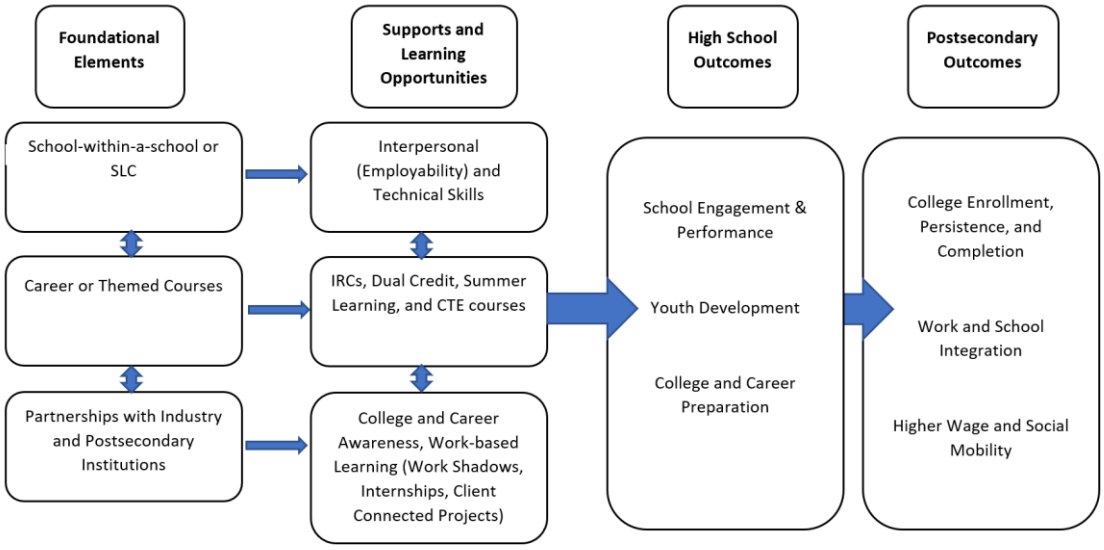



*Note.* This figure shows Kemple's (2001) career academy, conceptual model.

## Appendix B: USI Career Academy Conceptual Model

**Figure 2**

***USI Career Academy Conceptual Model***




*Note.* This figure shows USI's career academy, conceptual model. Definitions include Small Learning Community (SLC), Industry-recognized credentials (IRCs), and Career and Technical Education (CTE).

## Appendix C: Request for Permission to Conduct Research

On Wed, Dec 16, 2020 at 4:57 PM Danielle Binion <dbinion@prepkc.org> wrote:

Susan, Doug, and Kristin,

I'd like to request permission to utilize and evaluate PREP-KC's archival Career Academy participant data for my dissertation with Baker University. For the study, I will be reviewing postsecondary enrollment, persistence, and completion data using our National Student Clearinghouse queries and PREP-KC's data dashboards. For this study, I will maintain privacy and confidentially by omitting student biographical information and replacing it with randomized identifying numbers which Kristin has already assigned for our data-keeping. The data will be organized into spreadsheets and potentially integrated into IBM's SPSS Statistics platform for analysis.

For context, I have included below the purpose of the study along with the research questions.

Please reply all with consent and any questions you may have.

Thanks for your support!

Best,
Danielle

**Purpose of the Study**

The purpose of this quantitative casual comparative study was to examine the impact of PREP-KC's Career Academy participants by identifying cohorts of Health Academy participants and examining their success post-high school graduation compared to demographically matched students interested in pursuing health-related post-secondary education and/or career at the following intervals: year-one, year-two, and year-six. For these purposes, success is defined as entry, persistence, and completion of a postsecondary program (2-year, 4-year, or certification).

**Research Questions**

**RQ1.** To what extent does participation in the PREP-KC Health Academy impact on postsecondary enrollment when compared to nonparticipating demographically matched students.

**RQ2.** To what extent does participation in the PREP-KC Health Academy

impact on postsecondary persistence when compared to nonparticipating demographically matched students.

**RQ3.** To what extent does participation in the PREP-KC Health Academy impact on postsecondary completion when compared to nonparticipating demographically matched students.

*PREP-KC is seeking additional volunteers willing to share their career stories with urban students. Click here to get more information and RSVP for our upcoming events.*

**Danielle Binion** ● Career Academies Coordinator
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## Appendix D: Approval to Conduct Research

**From:** Kristin Kush
**To:** Danielle Binion; danielle.binion@yahoo.com
**Subject:** Fwd: Data Access Request re: Dissertation Research
**Date:** Wednesday, October 6, 2021 6:39:59 PM

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---------- Forwarded message ---------
From: **Danielle Binion** <dbinion@prepkc.org>
Date: Thu, Dec 17, 2020 at 1:27 PM
Subject: Re: Data Access Request re: Dissertation Research
To: Douglas Elmer <delmer@prepkc.org>
Cc: Kristin Kush <kkush@prepkc.org>, Susan Wally <swally@prepkc.org>, Andra Schneider <aculp@prepkc.org>

Doug, I absolutely would love for you to join the conversation.

I'll keep you posted on my next approval process.

Thanks,
Danielle

*PREP-KC is seeking additional volunteers willing to share their career stories with urban students. Click here to get more information and RSVP for our upcoming events.*

**Danielle Binion** ● Career Academies Coordinator
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On Thu, Dec 17, 2020 at 12:47 PM Douglas Elmer <delmer@prepkc.org> wrote:
> This works for me, let me know if you two would like me to sit in on the datasets discussion. Looking forward to seeing what you learn from this dissertation!
>
> Doug
>
> On Thu, Dec 17, 2020 at 11:53 AM Kristin Kush <kkush@prepkc.org> wrote:
> > I consent and don't have any questions. We can get together to talk about any questions you have on the dataset(s).
> >
> > On Wed, Dec 16, 2020 at 5:44 PM Susan Wally <swally@prepkc.org> wrote:
> > > Danielle, this study has the potential to add to our understanding of the 3 areas of impact you articulate and may be quite helpful in shaping future programs. I also have confidence in your integrity as a researcher.
> > >
> > > I'll wait to hear questions from Doug or Kristin, but absent that, I approve.