THE IMPORTANCE OF EARNINGS IN CAREER TECHNICAL EDUCATION FIELD OF STUDY CHOICE

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THE IMPORTANCE OF EARNINGS IN
CAREER TECHNICAL EDUCATION FIELD OF STUDY CHOICE

A Dissertation
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Education
in
Educational Leadership

by
Karen S. Childers
December 2019
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Approved by:

Edna Martinez, Committee Chair, Education

Kevin J. Fleming, Committee Member

James E. Smith, Committee Member
ABSTRACT

The purpose of this mixed methods research study was to examine factors influencing community college Career Technical Education (CTE) students in their field of study choice. The problem was twofold: (1) Community college CTE performance metrics include earnings goals, but there is little research to inform the performance metric (Harrington, Mbomeda, & Casillas, 2018; Roberts, Leufgen, & Booth, 2018); and (2) CTE students, who are disproportionately economically disadvantaged, pursue fields of study that do not lead to a living wage (Bahr, 2010; Booth & Bahr, 2012; Zhang & Oymak, 2018).

For this within-stage mixed model design (Johnson & Onwuegbuzie, 2004), I created an instrument to examine quantitative and qualitative data for CTE field of study choice. The Choice of College Major Survey (CCMS) had three domains: 1) student characteristics, which consisted of the 27 Likert items; 2) sociodemographic, which consisted of the seven demographic items; and 3) six open-ended items, which were the qualitative part of the study. I tested variables within the student characteristics domain and the career integration variable. I found statistically significant (p<.05), positive relationships between earnings concerns and CTE field of study choice (expressed in terms of median wage level) and career integration (e.g., exposure to careers, familiarity with career norms and professionals) and CTE field of study choice. Qualitative analysis affirmed and deepened quantitative results. The following four themes emerged: (a) Earnings are important in field of study choice; (b) Career interest is
the most important factor in field of study choice; (c) Connection to family; and (d)
Time is the price of entering the desired career. Taken together, my quantitative
and qualitative findings supported earnings and career interest as important
factors in CTE student field of study choice. Students were also influenced by
family and by pragmatic concerns such as whether or not the future career fit
within the student’s plan.

I used the conceptual model of Hirschy, Bremer, and Castellano (2011)
for community college CTE student success. Although I did not set out to
propose a new conceptual model, my findings led to a proposed conceptual
model for CTE field of study choice, based on the model by Hirschy et al. (2011).
My findings indicated a distinction between *influencers*, which were included in
the conceptual model by Hirschy et al. (2011), and *purposeful process*, which
was not included. Because the conceptual model by Hirschy et al. (2011) was
designed to explain student attainment of educational goals rather than field of
study choice, purposeful process was not relevant in the original model.

Further testing and validation of the CCMS and the proposed conceptual
model would add to theory and practice. In this paper I make recommendations
for policy and practice and suggest further research.
ACKNOWLEDGEMENTS

I wish to acknowledge the many people who have provided support and guidance in this process. I am a proud alumna of California State University, San Bernardino, and I first send a blanket thank-you to the educators who made it possible for me, a nontraditional student, to complete undergraduate and graduate degrees at times that did not conflict with my full-time employment. I could not have done it otherwise, and I am grateful for the institutional responsiveness to my needs and the needs of others like me.

I also wish to thank my committee. Dr. Edna Martinez, thank you for your expertise and support through this process. I have become a better educator and person because of your classes and your thoughtful review of my work. I feel very fortunate to have worked closely with you as my dissertation chair. Dr. Kevin Fleming, I deeply appreciate your time and point of view as a practitioner and scholar. I am inspired by your work and look forward to continuing to see students win because of what you do. Dr. James Smith, the respect you command in the community has come through as I have discussed this process with friends and colleagues in higher education. Thank you for sharing your knowledge and helping me to become a stronger researcher. I could not have asked for a more dedicated, expert, and helpful committee. Thank you all.

To my family, thank you for your love and support. To my wonderful husband David, thank you for your encouragement, humor, patience, and for still being my favorite dinner date. To my children, parents, siblings, niece and
nephews, and friends – I missed you! Thank you for understanding when I was unable to fully participate in gatherings, and for being kind and loving throughout.

Special thanks to Dr. Vanessa Kettering for proofreading and consulting, and to the many friends who are examples of what I hope to be.

Finally, thank you to the members of cohort 11. We traveled this road together, and I am excited to see what happens next. I'm also sad that we'll see each other less often after this term. I hope to cross paths frequently as we go forward. Thank you, my friends.
DEDICATION

This study is dedicated to career education students, educators, and supporters.
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CHAPTER ONE
INTRODUCTION

In this chapter, I introduce my study of Career Technical Education (CTE) community college students’ college major choice. I describe the research problem, purpose, research questions, significance of the study, and conceptual framework. I list the assumptions, limitations, delimitations, and key terms used in the study. This study took place at a public community college in San Bernardino County in Southern California.

Problem Statement

Even after completing their studies at community college, many students enter the workforce and earn less than the living wage (Bahr, 2016a, 2016b; Booth, 2015). This is problematic for two reasons: (a) CTE students are more likely than their non-CTE peers to be economically disadvantaged (defined below) or have financial responsibility for family members, and (b) living wage (defined below) is a performance metric for California community college CTE programs. According to 2019 data from all public community colleges in California, only 53 percent of community college students entered a job that paid a living wage within three years of exiting the community college (LaunchBoard, 2019).

Publicly available earnings data consistently show wide variation by CTE college major (LaunchBoard, 2019). Researchers have reported similar findings;
for example, in his study of 1.1 million CCC alumni, Bahr (2016a) found significantly higher median earnings in public and protective services than in family and consumer sciences. If potential earnings were the only factor in CTE students’ college major choice, it would be difficult to explain why some students select majors that lead to careers with lower earnings.

Purpose Statement

The purpose of this study was to examine factors influencing community college CTE students in their field of study choice. The problem was twofold: (1) Community college CTE performance metrics include earnings goals, but there is little research to inform the performance metric; and (2) CTE students, who are disproportionately economically disadvantaged, pursue fields of study that do not lead to a living wage.

While earnings are not synonymous with student success (Hirschy, Bremer, & Castellano, 2011), it is unclear whether students pursue low-wage fields of study for personal reasons or because of systemic barriers (Bailey, Jaggars, & Jenkins, 2015; Brint & Karabel, 1989; Clark, 1960; Dougherty, 1994; Kugler, Tinsley, & Ukhaneva, 2017; Levin, 2007). If the factors influencing field of study choice are changeable, or malleable (Hirschy et al., 2011, p. 310), this study could inform strategies to improve earnings outcomes for CTE students, including those who come from economic disadvantage.
Research Questions

I drew on Creswell (2015) and Johnson and Onwuegbuzie (2004) to formulate research questions for this within-stage mixed-model design. My research questions were as follows:

1. What factors do students consider when they choose their CTE field of study at a community college?
2. Are earnings a significant and strong factor in CTE students' field of study choice?
3. What results emerge when comparing open-ended survey responses to results from quantitative analysis regarding factors influencing field of study choice for community college CTE students?

Significance of the Study

In order to meet CTE performance metrics and address the needs of community college CTE students, it is important to increase understanding of the factors that influence field of study choice. As a group, community college CTE students skew toward economic disadvantage (Radford, Velez, Bentz, Lew, & Ifill, 2016). Data from the National Center for Educational Statistics (NCES) consistently show that community college students, and CTE students in particular, are more likely to be economically disadvantaged, students of color, and responsible for the support of family members (Radford et al., 2016). Data from California indicate that even after leaving college, only about half of CTE students earn a living wage within three years (LaunchBoard, 2019). In addition,
in 2017 the California legislature added post-college earnings to performance metrics for community college CTE programs (CCCCO, 2018a). Performance metrics affect funding at both the federal and state levels. If California community college CTE programs are unable to meet their performance metrics, their funding may be lowered, ultimately affecting CTE students. Furthermore, learning more about the process of CTE field of study choice could inform strategies to help more students achieve a living wage after leaving college.

Conceptual Framework

Hirschy, Bremer, and Castellano (2011) proposed a conceptual framework in which student success was defined by the student and synonymous with attainment of the educational goal. In their model, three interrelated constructs influenced student success: (1) student characteristics, (2) college environment, and (3) local community environment (Hirschy et al., 2011). In addition, the variable career integration included familiarity with fields of study from both the college and local community environment (Hirschy et al., 2011). Drawing on Morgan, D’Amico, and Hodge (2015), I focused on variables within the student characteristics construct and career integration variable.

Assumptions

My study involved two underlying assumptions. First, I assumed the participants gave honest, thoughtful, and accurate responses to fixed response and open-ended items. In order to encourage such responses, I included a
confidentiality statement and protected the confidentiality of the survey responses via password-protected storage (Fan & Yan, 2010). Second, I assumed participants were able to understand the survey items and respond accordingly. To facilitate understanding, I designed the survey according to established standards which will be discussed further in Chapter 3.

Limitations

The first limitation of this study had to do with publicly available data regarding earnings in different employment sectors. I purposefully selected participants from fields of study showing high, medium, and low earnings in LaunchBoard, the database of the California Community College Chancellor’s Office (CCCCO). LaunchBoard imports earnings data from the state unemployment insurance (UI) wage database, which does not include workers who are self-employed, employed out of state, or employed by the federal government (CCCO, 2018a). Therefore the pool from which I selected participants did not reflect the entire workforce.

Secondly, survey responses could have been limited if participants felt coerced into taking the survey or lacked motivation to complete it thoroughly (Creswell, 2014; Fan & Yan, 2010; Glesne, 2016; Krosnick & Presser, 2010). In addition to the informed consent, I attempted to minimize the perception of coercion by including a written statement on the survey and asking faculty to make it clear to their students that participation in the survey was optional. In addition, surveys administered in person and online were not part of class
activities. To increase motivation, participants who submitted the survey had the opportunity to enter into a drawing for one of six $30 Amazon gift cards (Fan & Yan, 2010). The gift cards were awarded in September 2019 after data collection had been completed.

Delimitations

This study could not capture the experience of all students who chose a CTE field of study. It could not, for example, include students from every field of study or every community college. Therefore, I designed the study to include one community college in Southern California and employment sectors based on median earnings shown in LaunchBoard. The fields of study from which I drew participants were limited to those offered at the community college where the survey was administered.

Definitions of Key Terms

In this study, I operationalized key terms as shown below.

**Apprenticeship.** Drawing on Collins (2016), I operationalized apprenticeship as a formal, paid training program consisting of at least 144 hours per year of classroom instruction and at least 2,000 hours of on-the-job training and resulting in a nationally recognized credential.

**Career Technical Education (CTE).** This term refers to a group of community college programs of study that train students for work in skilled trades. CTE is also referred to in the literature as Career Education (CE). I used
CTE synonymously with career education, occupational education, vocational education, and technical education.

**Certificate.** This term refers to a credential awarded upon successful completion of a brief CTE program of study, usually two years or less.

**Completion.** Completion is defined as transfer or the receipt of a credential after earning passing grades in all required course work.

**Credential.** This term refers to a certificate or degree issued by the community college that serves as verification of competence in a specified field of study.

**CTE Program of Study.** I drew on federal Perkins V legislation, which defines a CTE Program of Study as “a coordinated, non-duplicative sequence of academic and technical content … that incorporates challenging, state-identified academic standards; addresses academic and technical knowledge, as well as employability skills; is aligned to the needs of industries in the state, region, Tribal community, or local area; progresses in content specificity; has multiple ‘entry and exit points’ that allow for credentialing; and ultimately culminates in the attainment of a recognized postsecondary credential” (Zekus & Hyslop, 2018).

**Earnings.** Synonymous with wages, earnings are payment by an employer to an employee for work performed.

**Economically disadvantaged.** I drew on the definition used in performance metrics for the California Strong Workforce Program. Economically disadvantaged students are those who meet the federal definition of the term
(i.e., receiving income-based public assistance, homeless, foster child, income below the federal poverty level, or receiving a Pell grant) or who qualify for the income-based California Promise Grant, formerly known as the Board of Governors fee waiver (CCCCO, 2018a).

Field of study. This term referred to the area of concentration for CTE students.

High wage. I used this term to refer to fields of study that show post-college median earnings exceeding the living wage for a family of two adults and one school-aged child.

Industry-recognized credential. This term encompassed credentials issued by educational institutions, as well as licenses and certifications issued by industry and government agencies.

Living wage. As defined by the California Community College Chancellor’s Office (CCCCO), living wage is a regional measure of income needed to provide basic needs including housing, child care, food, transportation, health care, and taxes. An additional 10 percent is added to the standard to allow for miscellaneous costs such as clothing, personal items, paper products, nonprescription medications, and household items. For purposes of comparing post-college earnings to a living wage standard, CCCCO uses the living wage level for a family size of one adult in the county in which the college is located (CCCCO, 2018b).

Low wage. I used this term to refer to fields of study that show post-college
median earnings at or below 110 percent of the living wage for one adult.

**Major.** This term referred to the area of concentration for undergraduate CTE and non-CTE students. The term was used interchangeably on the Choice of College Major Survey (CCMS) because the survey was intended only for CTE students; however, the term *field of study* was used elsewhere in this paper when discussing CTE students exclusively.

**Medium wage.** I used this term to refer to fields of study that show post-college median earnings between the living wage for one adult and the living wage for two adults and one school-aged child.

**Nontraditional student.** Drawing on Levin (2007), I used this term to describe a community college student who does not meet the definition of the traditional student. This included adults age 25 or older, returning students, heads of household, married students, veterans, ex-offenders, employed students seeking skills upgrades, and new immigrants, among others (Levin, 2007).

**Performance metrics.** This term referred to measurements of success set by state and federal agencies to determine ongoing eligibility for and level of funding.

**Self-sufficiency.** This term referred to the ability to pay for basic needs including housing, food, transportation, health care, and taxes. For purposes of comparing median earnings to a living wage standard, CCCC0 uses a regional self-sufficiency standard for a family size of one (CCCC0, 2018a).
**Skills-builder.** Drawing on Bahr (2010) and Booth and Bahr (2012), I used this term to describe students who enrolled in nine or fewer units, took a narrow and specific pattern of course work, passed their courses, and exited the community college without attaining a credential.

**Traditional student.** This term referred to a community college student who attends full time directly after high school, is 18-24 years old, and intends to transfer.

**Transfer.** This term referred to leaving community college to enroll in a four-year college or university.

**Summary**

In this chapter I introduced my study, stated my purpose and research questions, discussed the significance of my study, and defined key terms. I introduced the conceptual model of Hirschy et al. (2011) and described the assumptions, limitations, delimitations, and key terms to be used in this study. In the next chapter, I review literature related to my topic and identify gaps to be addressed.
CHAPTER TWO
LITERATURE REVIEW

Introduction

Preparing students for careers that pay a living wage is a priority for community college career and technical education programs in the US and California. The federal Carl D. Perkins Career and Technical Education Act of 2006 (Perkins IV) and the Strengthening Career and Technical Education for the 21st Century Act of 2018 (Perkins V) include both high-wage and self-sufficiency in their funding requirements. In California, the 2017 Strong Workforce Program includes attainment of a living wage in its performance metrics for career and technical education (CTE), and non-CTE programs are also subject to living wage performance metrics under the Student Centered Funding Formula beginning in the 2018-19 academic year.

The California Community College Chancellor’s Office (CCCCO) provides tools to examine CTE outcomes for the state’s 115 public community colleges. However, there is little research examining the factors influencing community college CTE students when they choose their field of study. Moreover, although the Strong Workforce Program and the Student Centered Funding Formula include living wage in their performance metrics, scholarly literature does not address whether earnings are a significant or strong factor in CTE students’ field of study choice.
In this chapter, I contextualize employment and earnings within the history, mission, and function of community colleges in the United States and California. I synthesize literature describing community college students and discuss CTE as a community college function attuned to employment and earnings goals. I describe federal and state CTE legislation including the emergence of the living wage performance metric in California. Furthermore, I discuss critiques of the community college system and its CTE function. Finally, I discuss gaps in the literature use the model formulated by Hirschy et al. (2011) as my conceptual framework.

History, Mission, and Function of United States Community Colleges

Post-secondary education in the United States has a long history of providing career and academic education. Geiger (2011) traced the dual roles of US higher educational institutions as far back as 1636, when Harvard was founded as an academic institution whose primary goal was to train aspiring ministers. Philosophy and language were always included in ministerial training at Harvard and other Ivy League colleges, and as the years passed, Ivy League colleges became liberal arts institutions that catered to gentry and admitted a small percentage of applicants (Geiger, 2011). Geiger (2011) credited Harvard President Charles W. Eliot with leading the reorganization of that institution’s curriculum in the late 1800s, positioning graduate education at the center of the College’s mission and undergraduate education as the means to support graduate study:
A learned, full-time faculty replaced practitioner-teachers... professional education was eventually defined as requiring a bachelor's degree.... The American university would be an institution in which large numbers of undergraduates would support a numerous, specialized faculty who would also teach graduate students. (Geiger, 2011, p. 52)

Eliot's changes at Harvard pushed career education to the undergraduate level and predated the establishment of the first community colleges in the early 1900s (Cohen, Brawer, & Kisker, 2014; Geiger, 2011). Four-year colleges and universities accepted career education but stressed the prestige of professional preparation (Geiger, 2011). Grubb and Lazerson (2005) traced the history of higher education from the 1800s through the early 2000s and argued that four-year institutions purposefully positioned themselves as the appropriate home for prestigious career preparation, even in professions that previously did not require a four-year degree. For example, attorneys in the late 1800s learned their profession through clerking, doctors often practiced without having earned a degree, and engineers learned their craft on the job (Grubb & Lazerson, 2005). College degrees only gained importance in these professions when their corresponding fields advanced to the point where on-the-job training failed to provide sufficient skills (Grubb & Lazerson, 2005). Similar evolution occurred in fields such as accounting, business, dentistry, nursing, and teaching; and four-year institutions responded by establishing schools to address the needs (Grubb & Lazerson, 2005). Cornell established its engineering school by changing its
Sibley College of the Mechanic Arts to “an academic model with higher admission standards and two years of required course work” (Grubb & Lazerson, 2005, p. 5). Even the historic Morrill Act of 1862 encouraged professional preparation, including in its charge a call for agricultural and mechanical training (Grubb & Lazerson, 2005).

As four-year institutions embraced professional preparation, community colleges began to flourish. Beginning in the early 1900s, community colleges were established from trade and technical colleges and expansions of high school districts (Cohen et al., 2014; Longanecker, 2008). Career education was a priority for community colleges from their start, but the function at community college was less prestigious than at four-year institutions (Grubb & Lazerson, 2005). Just as career education had been relegated to the undergraduate level by elite institutions like Harvard, four-year institutions pushed technical and vocational training to community college (Geiger, 2011; Grubb & Lazerson, 2005). Four-year institutions provided “professional education to distinguish it from lower-level vocational training” (Grubb & Lazerson, 2005, p. 2), and emerging community colleges became the place for technical, vocational, or occupational education (Cohen et al., 2014).

Cohen, Brawer, and Kisker (2014) listed five curricular functions of community colleges: (a) preparing students for transfer to a four-year college or university, (b) occupational education, (c) continuing education, (d) developmental education, and (e) community service. These functions were
consistent with community college activities through the mid-1980s; however in
the late 1980s, community colleges began to explore bachelor’s degrees as a
way to expand access to higher degrees for their students (Floyd & Walker,
2009; Levin, 2004; Longanecker, 2008). Scholars and practitioners debate
whether the expansion to community college bachelor’s degrees signifies
institutional evolution or mission creep (Floyd & Walker, 2009; Levin, 2004;
Longanecker, 2008).

The occupational education function of community college stemmed from
apprenticeships, the historic model for learning a trade (Cohen et al., 2014). The
National Apprenticeship Act of 1937 established formal apprenticeship programs
with the US Department of Labor (DOL), and in 2018 there were 13,656
apprenticeships registered with DOL (Klor de Alva & Schneider, 2018). Federally
registered apprenticeships require at least 144 hours of formal instruction and
2,000 hours of supervised, on-the-job training and end with a nationally
recognized credential (Collins, 2016). Sources of federal funding for
apprenticeships include the Women in Apprenticeship and Non-Traditional
Occupations Act (WANTO), the American Apprenticeship Initiative of 2016,
appropriations through the federal budget, and workforce development funds
through the Workforce Innovation Opportunity Act (Collins, 2016). Several states
also support apprenticeships; for example, in 2018 the California Community
College Chancellor’s Office (CCCCO) was appointed as fiscal agent for $10
million in ongoing, annual grant funds under the California Apprenticeship
Initiative (Koller, 2018). In addition, the California Division of Apprenticeship Standards (DAS) provides guidance on apprenticeship standards and assists stakeholders in connecting to potential funding opportunities (“About the Division of Apprenticeship Standards (DAS),” n.d.). DAS works with businesses, community colleges, labor unions, employer associations, nonprofit organizations, and other state and federal agencies to create and strengthen apprenticeship programs in California (“About the Division of Apprenticeship Standards (DAS),” n.d.).

Apprentices are paid employees who work throughout their apprenticeship, and more than 90 percent stay with the same employer after completing their program (Sack & Allen, 2019). Federal and state funding for apprenticeships prioritize veterans, ex-offenders, out-of-school youth, and others whose needs and preferences do not fit traditional post-secondary schooling, and apprenticeship programs have drawn praise from industry and educational leaders for serving these populations (Klor de Alva & Schneider, 2018; Koller, 2018; Sack & Allen, 2019). Apprenticeships have also drawn criticism for being male-dominated, heavily focused on only a few fields of study, and underutilized (Klor de Alva & Schneider, 2018; Koller, 2018). According to Koller (2018), apprentices comprised only about 0.5% of the workforce in California despite enjoying advantages such as paid training and high employment and earnings outcomes. In 2018 California Governor Gavin Newsom called for growth of more than 500 percent in 10 years, from 86,000 apprentices in 2018 to 500,000 in
In this study, I focus on the occupational education function described by Cohen at al. (2014). Occupational education, now commonly called career education or career and technical education (CTE), referred to specialized training for skilled trades and other careers (Cohen et al., 2014; Harrington, Mbomeda, & Casillas, 2018). Such training has also been known as vocational education. I use the terms occupational education, career education, career technical education, and vocational education interchangeably.

**Legislative Support of Career Technical Education**

Federal support of vocational education began with the Smith-Hughes Act of 1917, was supplemented by the National Apprenticeship Act of 1937, and continued with the 1963 Vocational Education Act and its amendments (Cohen et al., 2014; Klor de Alva & Schneider, 2018). Since 1984, the primary source of federal vocational education funding has been legislation named after former US congressman Carl D. Perkins (Cohen et al., 2014; Harrington et al., 2018). Other federal programs that provided funding to community college vocational education programs included the Job Training Partnership Act of 1982 and the Workforce Investment Act of 1998 (Cohen et al., 2014). In 2006, the fourth revision of the Perkins Act (Perkins IV) adopted the CTE term, changing the Carl
D. Perkins Vocational and Technical Education Act (1998 Perkins III) to the Carl D. Perkins Career and Technical Education Act (2006 Perkins IV). Perkins is dropped from the most recent iteration of the act, the Strengthening Career and Technical Education for the 21st Century Act (2018 Perkins V; Harrington et al., 2018). Along with Perkins funding, community college CTE programs receive federal funding under the Workforce Innovation and Opportunity Act (WIOA) of 2014 (Foxx, 2014) and can apply for federal grants such as the Advanced Technical Education program through the National Science Foundation (1994; Cohen et al., 2014).

Several states also passed legislation in support of community college CTE. For example, in 1977 Maryland strengthened community college CTE programs in response to “changing values and attitudes among students and their families as to the level of education required to qualify for desirable employment opportunities…. [T]hroughout the next decade, 80 percent of available jobs would require less than a bachelor’s degree” (as cited in Cohen et al., 2014, p. 313). In 2019, the California legislature approved $15 million in annual funding for the California Apprenticeship Initiative (up from $10 million the previous year), supporting community colleges in development of registered apprenticeships (“CAI RFA,” n.d.). In addition, the California legislature approved $200 million for the 2016-17 budget year to create the Strong Workforce Program, with the stated purpose “to improve the availability and quality of CTE programs leading to certificates, degrees, and credentials” (Legislative Analyst’s
Office, 2018, p. 1). The following year, the California legislature approved $248 million in annual, ongoing funding to community colleges for the Strong Workforce Program (Legislative Analyst’s Office, 2018).

Career Technical Education Growth and the Open Access Mission

Federal and state support of CTE programs has facilitated growth. In CTE and non-CTE programs, community college access and enrollment grew during the 1900s due to a building boom and increased demand. From 1915 to 2016 (the most recent year for which data is available), the number of public two-year colleges in the United States grew from 19 to 910 (Cohen et al., 2014; “Digest of Education Statistics, 2017,” n.d.). Spikes in two-year college construction occurred in the 1920s and 1950s when federal highways were built, and again in the late 1960s to early 1970s when the baby boomer generation entered college (Cohen et al., 2014).

CTE enrollment outpaced non-CTE enrollment for a twenty year period from the 1960s to the 1980s (Cohen et al., 2014). In addition to increased funding, Cohen et al. (2014) attributed CTE growth to greater numbers of nontraditional students, the flexibility of CTE programs for part time students, a shift in CTE from high school to community college, and the number of community colleges available. Proximity to home provided access to CTE programs for nontraditional and commuter students (Cohen et al., 2014).

As demand for college rose, the practice of admitting students without imposing performance-based admissions criteria was referred to as open access
and became embedded in the mission of US community colleges (Cohen et al., 2014). In California, the largest community college system in the US, the open access mission and occupational education function of community college was explicit in the 1960 Master Plan for Higher Education in California and continues to drive policy and practice. California Community Colleges (CCC) made significant investment in open access and occupational education after the Great Recession of 2007-09 (CCC Student Success Task Force, 2012), including the 2017 Strong Workforce Program and the 2017 Vision for Success plan. Before turning to the topic of students served by community college and CTE programs, I now discuss CCC history from the 1960 Master Plan for Higher Education in California to state reforms passed in 2017 that affect CTE through the time of this writing.

The California Community College from 1960 through 2019

The CCC is the largest community college system in the US with 115 colleges and 2.1 million students – more than one third of all US community college students (“Digest of Education Statistics, 2017, Table 303.30,” n.d.; Legislative Analyst’s Office, 2017). The Master Plan for Higher Education in California (Master Plan) has been the guiding document for higher education in California since 1960 (California State Department of Education, 1960; Legislative Analyst's Office, 2017). Originally intended to guide California higher education from 1960 through 1975, the document still survives with few substantive changes. Since 1960, however, California has experienced
significant population growth, increases in college-going rates and education costs, demographic changes, and increased demand for access to higher education (Legislative Analyst’s Office, 2017). The state legislature has responded by introducing bills designed to address specific problems, but there has been no new, unified vision from which to address higher education needs in California (Legislative Analyst’s Office, 2017). In 2017 the state legislature convened a special Assembly Select Committee to review and update the Master Plan (Green, 2018). From August 2017 to August 2018, the Committee held five public hearings to gather input, but no final report was released, and the process did not result in any changes to the Master Plan (Green, 2018).

Prior to the creation of the Master Plan, California higher education had already moved toward differentiated missions. The Morrill Act of 1862 established the University of California (UC) and endowed funding at the federal level to help support the UC in perpetuity (Goodchild & Wechsler, 1997). Founded as an accessible, public, comprehensive university, by 1960 the UC had already begun to shift toward research (Douglass, 2010; Longanecker, 2008). The California State University (CSU) was brought together as a result of the Master Plan, but individual campuses had started as normal schools and teachers colleges as early as 1857 (California State University, n.d.). Thus by 1960, CSUs were established centers of instruction, providing undergraduate instruction and master’s degrees in applied fields and education (California State University, n.d.). Finally, community colleges filled the need for vocational
training and lower-division transfer classes (Longanecker, 2008). The Master Plan reiterated the differentiated missions of the UC, CSU, and CCC and listed vocational training as a primary function of CCC. Moreover, the Master Plan confirmed the open access mission of CCC by recommending that the UCs restrict admission to the top 12.5 percent of high school graduates, the CSUs restrict admission to the top 33.3 percent, and the CCC remain open to all applicants (California State Department of Education, 1960).

**Guided Pathways**

In 2015, community college researchers Thomas R. Bailey, Shanna S. Jaggars, and Davis Jenkins published findings that increased national awareness of pathways (Bailey et al., 2015). Bailey et al. (2015) included evidence from researchers and organizations that had collaborated with the goal of increasing credential attainment for community college students. Organizations such as the American Association of Community Colleges (AACC), Achieving the Dream (ATD), the Aspen Institute, the Community College Research Center (CCRC), Complete College America (CCA), and Jobs for the Future (JFF) formed the Pathways Collaborative, which continues to define and advance the guided pathways model (“Pathways Collaborative,” n.d.).

Bailey et al. (2015) operationalized the guided pathways model as a strategy “to engage faculty and student services professionals in creating more clearly structured, educationally coherent program pathways that lead to students’ end goals, and in rethinking instruction and student support services in
ways that facilitate students’ learning and success as they progress along these paths” (Bailey et al., 2015, p. 3). The guided pathways model was contrasted with the cafeteria-style or self-service model, which gave community college students “a plethora of poorly explained program, transfer, and career options … [which] do not clearly lead to the further education and employment outcomes they are advertised to help students achieve” (Bailey et al., 2015, p. 3).

By 2018, more than 250 community colleges in 25 US states had adopted the guided pathways model as a framework for educational reform (Jenkins, Lahr, Fink, & Ganga, 2018). In California, the CCCCO recommended the guided pathways model in 2017 as the preferred framework for providing programs of study across all community college CTE and academic programs in the state (Esch & Supinger, 2017).

Bailey et al. (2015) proposed offering students a structured pathway from the time they entered community college until they either completed a credential or transferred to a four-year university. Their recommendations included active intervention from before the student entered college until after they completed their credential and were transitioning into the workforce or transferring to a four-year university (Bailey et al., 2015). The goal was credential attainment, defined as either an associate degree or CTE certificate; however, Bailey et al. (2015) also encouraged policymakers to consider transfer as a successful outcome regardless of whether or not the student attained a degree prior to transfer.
Employment was not mentioned in Bailey et al. (2015) as a successful outcome, although other scholars recommended consideration of employment as a measure of success for community college students (Bahr, 2016b; Booth, 2014; Booth and Bahr, 2012; Cohen et al., 2014). Cohen et al. (2014) recommended a broad view of successful outcomes that addressed all functions of the community college, including vocational education. Specifically, Cohen et al. (2014) proposed consideration of employment as a successful outcome: Students who leave before completing the programs and enter employment in the field for which they are prepared should be considered program successes; these job-outs account for as many as 75 percent of the students in some programs. (p. 408)

Consistent with Cohen et al. (2014), the Pathways Collaborative included “attainment of jobs with value in the labor market” (Pathways Collaborative, 2017) among successful outcomes in the guided pathways model. Implementation of the guided pathways model was expressed as four activities: (1) clarify the paths, in which students decide on a program area based on detailed career and credential information; (2) enter the path, in which students receive advising and create educational plans; (3) stay on the path, in which students receive “ongoing, intrusive advising” (Pathways Collaborative, 2017, p. 1) and support to progress toward their credential; and (4) ensure learning, in which colleges “track mastery of learning outcomes that lead to credentials, transfer, and/or employment” (Pathways Collaborative, 2017, p. 1).
CCC students reflect the diverse needs and characteristics of community college students across the US. I now describe community college students.

Community College Students

Approximately 40 percent of US college students attend public community colleges (Cohen et al., 2014). Community college students numbered approximately 6 million in 2000, 6.5 million in 2005, and were projected to reach 6.7 million in 2019 (Cohen et al., 2014; “Digest of Education Statistics, 2017, Table 303.30,” n.d.). According to Cohen et al. (2014), reasons for the increased number of students in community college include enrollment by older and nontraditional students, the availability of financial aid, part time enrollment, and dual enrollment programs serving high school students. The increased number of students in community college is also part of a growth trend in college enrollment overall. According to data from the National Center for Education Statistics (NCES), undergraduate enrollment at four-year institutions grew 44 percent between 2000 and 2016 (the most recent year for which data are available), from 7.2 million to 10.8 million students (McFarland et al., 2018).

Completion of Degrees and Certificates

Community college students complete certificates and associate degrees at a higher rate than students who begin their post-secondary education at a four-year institution, and they complete bachelor’s degrees at a lower rate than their four-year counterparts (Radford, Berkner, Wheeless, & Shepherd, 2010). Radford, Berkner, Wheeless, and Shepherd (2010) reported six-year outcomes
for a national sample of 19,000 students who entered their first post-secondary institution at the beginning of the 2003-04 academic year. The students were the subjects of a longitudinal study by NCES and were interviewed in 2004, 2006, and 2009 (Radford et al., 2010). Radford et al. (2010) collected outcomes data using interviews, student transcripts, federal financial aid and federal student loan information, and Pell Grant records. Combined completion rates for certificates, associate degrees, and bachelor’s degrees were 34 percent for community college students and 65 percent for students who began their postsecondary education in a four-year college or university (Radford et al., 2010). Table 1 shows the percentage of students in the sample who completed a certificate, associate degree, bachelor’s degree, no degree or certificate, or were still enrolled at the end of the 2008-09 academic year. For students who completed more than one certificate or degree, only the highest degree was reported (Radford et al., 2010).
Table 1

2003-04 First-time Student Outcomes after 6 Years

<table>
<thead>
<tr>
<th>Highest benchmark achieved</th>
<th>Percentage by institutional type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All students</td>
</tr>
<tr>
<td>Certificate</td>
<td>9%</td>
</tr>
<tr>
<td>Associate Degree</td>
<td>9%</td>
</tr>
<tr>
<td>Bachelor's Degree</td>
<td>31%</td>
</tr>
<tr>
<td>Still enrolled</td>
<td>15%</td>
</tr>
<tr>
<td>Not enrolled, no certificate or degree</td>
<td>35%</td>
</tr>
</tbody>
</table>

*Note. Adapted from “Persistence and attainment of 2003–04 beginning postsecondary students: After 6 years” by Radford et al., 2010*

The finding by Radford et al. (2010) of 34 percent credential completion in 6 years for community college students is consistent with a wide body of research on community college student completion (Bailey et al., 2015; Booth & Bahr, 2012; Hirschy et al., 2011). The statistic is worrisome to educators and has led to further research into the characteristics of community college students. Levin (2007) focused his research on nontraditional students.

The majority of US community college students are nontraditional. Levin’s (2007) study of nontraditional students included 13 community colleges in nine states, interviewing 180 administrators, faculty, staff, and students regarding the
experience of nontraditional students. Levin (2007) based his findings on the 180 interview transcripts, his observations at the colleges, review of institutional documents, informal conversations, and observations. Levin (2007) operationalized traditional community college students as being 18-20 years old, attending college full time directly after finishing high school, intending to transfer to a four-year college or university. Nontraditional students were simply defined as “the antithesis of the traditional” (Levin, 2007, p. 6). Therefore, nontraditional students included adults age 24 or older, students returning after a long absence from school, heads of household, married students, veterans, ex-offenders, employed students seeking skills upgrades, and new immigrants, among others (Levin, 2007). By this definition, Levin (2007) classified most community college students as nontraditional:

Of the 5.6 million credit-seeking community college students in 2000, close to 90 percent have one characteristic, such as delayed postsecondary enrollment or part-time attendance, that would classify them as nontraditional. (p. 2)

Similar to Levin (2007), Radford, Cominole, and Skomsvold (2015) found that approximately 74 percent of US undergraduate students had at least one nontraditional characteristic, such as having children of their own, working full time, or being age 24 or older. The results found by Radford et al. (2015) were based on NCES data and not disaggregated by two or four-year institution; however, they were consistent across time. For students enrolled in the 1995-96
academic year, 75.2 percent were nontraditional. For 1999-2000, nontraditional students comprised 74.5 percent of undergraduate students; for 2003-04, 72.1 percent, for 2007-08, 71.6 percent; and for 2011-12, 73.8 percent of students had at least one characteristic of a nontraditional student (Radford et al., 2015).

Characteristics of community college students differ from four-year college and university students in several ways. NCES data from the 2011-12 cohort reveal differences shown in Table 2. Community college students are older, more diverse, more often married or supporting dependents, and more likely to be situated in the lowest income quartiles (Radford et al., 2016). The data in Table 2 were collected by NCES based on students entering college for the first time in the 2011-12 academic year. With the exception of income data, all percentages in Table 2 were provided in the profile by Radford, Velez, Bentz, Lew, and Ifill (2016) as part of the first follow-up of the 2012/14 Beginning Postsecondary Students Longitudinal Study (BPS: 12/14). The BPS: 12/14 surveyed a random sample of approximately 24,800 students across the US who entered college in the 2011-12 academic year (Radford et al., 2016). Subjects were selected via random sampling of both institutions and students, and the descriptors in Table 2 are representative of the 4 million students who entered college in the US in the 2011-12 year (Radford et al., 2016). Income data in Table 2 were provided by NCES tables (NCES, n.d.).
Table 2

*Percentage of Students by Characteristic and Institutional Type*

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Public 4 year institution</th>
<th>Public community college</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nontraditional characteristics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age 24 or older</td>
<td>3.8%</td>
<td>18.7%</td>
</tr>
<tr>
<td>Gap between HS and college of 1 year or more</td>
<td>12.2%</td>
<td>31.7%</td>
</tr>
<tr>
<td>Married</td>
<td>1.8%</td>
<td>9.1%</td>
</tr>
<tr>
<td>Independent from parents</td>
<td>8.9%</td>
<td>29.5%</td>
</tr>
<tr>
<td>Unmarried with dependents</td>
<td>2.8%</td>
<td>9.2%</td>
</tr>
<tr>
<td>Veteran or active duty military</td>
<td>1.8%</td>
<td>3.0%</td>
</tr>
<tr>
<td>First generation college student</td>
<td>30.8%</td>
<td>46.5%</td>
</tr>
<tr>
<td>Enrolled in school full time</td>
<td>71.3%</td>
<td>37.4%</td>
</tr>
<tr>
<td>Demographic characteristics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>45.4%</td>
<td>47.2%</td>
</tr>
<tr>
<td>Female</td>
<td>54.6%</td>
<td>52.8%</td>
</tr>
<tr>
<td>White</td>
<td>61.0%</td>
<td>53.1%</td>
</tr>
<tr>
<td>Black</td>
<td>12.6%</td>
<td>13.4%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>14.4%</td>
<td>23.9%</td>
</tr>
<tr>
<td>Asian / Pacific Islander</td>
<td>7.1%</td>
<td>4.8%</td>
</tr>
<tr>
<td>Other or more than one race</td>
<td>5.0%</td>
<td>4.8%</td>
</tr>
<tr>
<td>Socioeconomic characteristics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lowest income quartile</td>
<td>21.9%</td>
<td>28.5%</td>
</tr>
<tr>
<td>Highest income quartile</td>
<td>29.3%</td>
<td>20.4%</td>
</tr>
<tr>
<td>Employed 35 or more hours per week</td>
<td>6.6%</td>
<td>18.1%</td>
</tr>
<tr>
<td>Employed 16-34 hours per week</td>
<td>15.7%</td>
<td>20.5%</td>
</tr>
<tr>
<td>Employed 1-15 hours per week</td>
<td>10.7%</td>
<td>5.4%</td>
</tr>
<tr>
<td>Not employed</td>
<td>66.9%</td>
<td>56.0%</td>
</tr>
</tbody>
</table>

Career Technical Education Students

Zhang and Oymak (2018) used the same NCES population of 4 million first-time college students in 2011-12 to examine characteristics of CTE students. CTE students were referred to as sub baccalaureate occupational students (Zhang & Oymak, 2018, p. 3) and operationalized as students pursuing certificates or associate's degrees in (a) agriculture and natural resources, (b) business and marketing, (c) communications and design, (d) computer and information sciences, (e) consumer services, (f) education, (g) engineering and architecture, (h) health sciences, (i) manufacturing, construction, repair, and transportation, (j) protective services, and (k) public, legal, and social services. Using this definition, Zhang and Oymak (2018) found that 38 percent of first-time, credential-seeking undergraduates in 2011-12 were CTE students.

Within community colleges, CTE students were even more diverse and nontraditional than the general student population. As shown in Table 3, CTE students showed more characteristics of the nontraditional student as defined by Levin (2007). In addition, Zhang and Oymak (2018) found that 1 in 5 CTE students enrolled in a private, for-profit institution. For CTE students pursuing a certificate, 49 percent of CTE students enrolled in private, for-profit institutions while only 36 percent pursued their certificate at public community colleges. In contrast, non-CTE community college students generally attended a public community college (82 percent) rather than a private, for-profit institution (2 percent; Zhang & Oymak, 2018). Finally, Zhang and Oymak (2018) found wide
variation in gender by field of study. For example, health sciences and consumer services showed 82 percent and 77 percent female students, respectively, in contrast with engineering and architecture (86 percent male) and computer and information sciences (77 percent male; Zhang & Oymak, 2018).

Table 3

*Percentage of Students, including Career Technical Education*

<table>
<thead>
<tr>
<th></th>
<th>Public 4 year institution</th>
<th>Public community college</th>
<th>CTE students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age 24 or older</td>
<td>3.8%</td>
<td>18.7%</td>
<td>51.6%</td>
</tr>
<tr>
<td>Lowest income quartile</td>
<td>21.9%</td>
<td>28.5%</td>
<td>29.0%</td>
</tr>
<tr>
<td>Highest income quartile</td>
<td>29.3%</td>
<td>20.4%</td>
<td>20.3%</td>
</tr>
<tr>
<td>First generation college student</td>
<td>30.8%</td>
<td>46.5%</td>
<td>47.8%</td>
</tr>
<tr>
<td>Male</td>
<td>45.4%</td>
<td>47.2%</td>
<td>40.2%</td>
</tr>
<tr>
<td>Female</td>
<td>54.6%</td>
<td>52.8%</td>
<td>59.8%</td>
</tr>
<tr>
<td>White</td>
<td>61.0%</td>
<td>53.1%</td>
<td>53.6%</td>
</tr>
<tr>
<td>Black</td>
<td>12.6%</td>
<td>13.4%</td>
<td>19.5%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>14.4%</td>
<td>23.9%</td>
<td>18.5%</td>
</tr>
<tr>
<td>Asian / Pacific Islander</td>
<td>7.1%</td>
<td>4.8%</td>
<td>4.0%</td>
</tr>
<tr>
<td>Other or more than one race</td>
<td>5.0%</td>
<td>4.8%</td>
<td>4.4%</td>
</tr>
</tbody>
</table>

Combining School with Employment

One characteristic of nontraditional students is full time employment (Levin, 2007). In the five academic years measured by Radford et al. (2015), an average of 32.9 percent of undergraduate students were employed full time. Levesque et al. (2008) found full time employment rates from 24.3 percent for students in four-year programs to 40.6 percent for students in community college CTE programs.

Full-time employment affects a student’s ability to complete a certificate or degree in two years. Velez, Bentz, and Arbeit (2018) studied first-time students who entered community college in the 2011-12 academic year and worked while enrolled their first year. Using data from the BPS:12/14, Velez et al. (2018) examined employed students’ demographic characteristics and progress through community college. They found that about 20 percent of students who worked 20 hours or less per week had earned an associate’s degree by 2014, compared to 10 percent of students who did not work and 9 percent of students who worked full time (Velez, Bentz, & Arbeit, 2018). The highest rates of full-time employment were found in students age 30 or older (33 percent were employed full time), married students without children (43.3 percent were employed full time), and married students with children (32.4 percent were employed full time; Velez et al., 2018). Conversely, the percentages of students working 20 or fewer hours per week were highest among students age 19 or younger (13.1 percent employed 20 or fewer hours per week), dependent students (13.2 percent), and
students whose parents had completed a bachelor’s degree or higher (14.1 percent; Velez et al., 2018). Velez et al. (2018) limited their report to descriptive statistics and did not draw conclusions, but their data are consistent with traditional models of student success which encourage full time enrollment and employment of no more than 20 hours per week (Kezar, Walpole, & Perna, 2015; Kuh, 2001).

Findings of lower completion rates for students employed full time have led scholars to reexamine why employed students enroll in community college, especially in CTE. Bahr (2010) and Booth and Bahr (2012) argued that employed adults who enrolled in class without completing a credential may have been looking for short-term training to update their skills. The term skills-builder (Booth & Bahr, 2012, p. 4) was used to describe students who enrolled in only a few courses (usually one or two semesters), passed their courses, and exited the community college without attaining a credential. Booth and Bahr (2012) contrasted skills-builders with completion-unlikely (p. 4) students, who showed similar enrollment patterns as skills-builders but completed their classes at a much lower rate.

Skills-builder research builds upon an earlier classification study by Bahr (2010). Bahr (2010) studied enrollment and transcript data of 165,921 students from 105 California public community colleges. Subjects’ initial enrollment was fall 2001, and Bahr (2010) observed their enrollment records through summer 2008. Bahr (2010) used k-means cluster analysis to develop a typology of
community college students based on their initial stated goal, their course-taking behavior, and their outcomes. Bahr (2010) classified students into 6 clusters: transfer, vocational, drop-in, noncredit, experimental, and exploratory. Transfer students took a high number of academic units geared toward transfer to a four-year institution; vocational students took courses toward a CTE credential; drop-in students (later renamed skills-builders) took a few courses successfully and then left; noncredit students took general interest or basic skills courses not applicable to a credential; experimental students (later renamed completion-unlikely) took a few courses unsuccessfully and then left; and exploratory students took many academic units in unconnected pathways (Bahr, 2010). Bahr (2010) concluded that skills-builders were achieving their educational goals, and he recommended expansion of performance metrics to allow colleges to consider employment outcomes regardless of degree or certificate completion. Bahr’s (2010) recommendations were later echoed by Booth (2014), Shulock, Chisholm, Moore, and Harris (2012), and in California’s Vision for Success document (Esch & Supinger, 2017). Beginning in 2017, California’s Strong Workforce Program (SWP) included employment and earnings outcomes in CTE performance metrics (CCCCO, 2018a, 2018b), and in 2018, earnings outcomes were included in the Student Centered Funding Formula across all California community college programs (Taylor, 2018).

For skills-builders, who by definition strategically take courses to upgrade their skills without earning a credential, earnings gains were most evident in
technology, industrial, and construction fields (Bahr, 2016b). Bahr (2016b) used the same sample of 1,115,386 CCC students that he used in his study of earnings after a CTE credential (Bahr, 2016a). Bahr (2016b) employed a student-level fixed effects linear regression model to analyze the data by field of study, and he found that skills-builders were not changing careers but rather were experiencing earnings gains within their careers after completing nine or fewer college credits.

In the next section, I define and describe CTE and discuss the existing literature regarding CTE and field of study choice.

Career Technical Education at Community Colleges

Career Technical Education (CTE) reflects community colleges’ history as trade and technical colleges and continues to address the occupational education function described by Cohen et al. (2014). CTE includes hundreds of occupations such as auto repair, culinary, diesel technology, early childhood education, human services (including drug and alcohol counseling and case management), manufacturing and industrial technology, nursing, paralegal, pharmacy technician, police academy, and welding (LaunchBoard, 2019). Some CTE programs award certificates, others award associate’s degrees, and others struggle to maintain enrollment because their students are in demand in the labor market after only a few credits (Bahr, 2016b). Many CTE fields also prepare students to gain external credentials such as state licenses (Bahr, 2016b). Some CTE programs of study can be completed in less than one year (e.g., machine
technology), while others require significant prerequisites followed by multi-year course work (e.g., nursing, physician’s assistant; Bahr, 2016a; C. Moore, Jez, Chishom, & Shulock, 2012).

Consistent with the Master Plan (California State Department of Education, 1960), all 115 California public community colleges offer CTE, although fields of study differ across institutions. Fields of study are categorized into broad industry sectors (LaunchBoard, 2019). CCCCO collects enrollment, completion, and earnings data for CTE fields of study and reports disaggregated data on LaunchBoard (CCCCO, 2018a). Industry sectors, examples of fields of study that fall under each sector, and median earnings for each sector are given in Table 4.

Although earnings data such as the amounts in Table 4 are publicly available through the CCCCO website, two key data points are missing. First, the earnings data are not compared to a regional living wage. Students and educators who navigate LaunchBoard or its student-facing counterpart, Salary Surfer, well enough to arrive at earnings data would also have to look up regional living wage in order to contextualize the earnings data. Moreover, scholarly research comparing post-CTE earnings to a regional living wage is silent. A tool comparing earnings to regional living wage would add to theory and practice. Second, as noted earlier, researchers have little information regarding the significance of earnings concerns in field of study choice for community college CTE students. I discuss existing literature next and call attention to gaps.
### Table 4

**Career Technical Education Industry Sectors in California**

<table>
<thead>
<tr>
<th>Industry Sector</th>
<th>Examples of Field(s) of Study</th>
<th>Median Quarterly Earnings 6 Months after 2015-16 Exit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Manufacturing</td>
<td>Industrial Systems Technology, Machining</td>
<td>$8,622</td>
</tr>
<tr>
<td>Advanced Transportation and Logistics</td>
<td>Diesel Technology</td>
<td>$7,132</td>
</tr>
<tr>
<td>Agriculture, Water and Environmental Technologies</td>
<td>Animal Science, Forestry</td>
<td>$7,133</td>
</tr>
<tr>
<td>Business and Entrepreneurship</td>
<td>Business Management</td>
<td>$8,664</td>
</tr>
<tr>
<td>Education and Human Development</td>
<td>Teacher Assistant, Child Development</td>
<td>$6,196</td>
</tr>
<tr>
<td>Energy, Construction and Utilities</td>
<td>Water and Wastewater Technology</td>
<td>$12,231</td>
</tr>
<tr>
<td>Global Trade</td>
<td>International Business and Trade</td>
<td>$8,307</td>
</tr>
<tr>
<td>Health (Nursing)</td>
<td>Nursing</td>
<td>$15,345</td>
</tr>
<tr>
<td>Information and Communication Technologies (ICT) and Digital Media</td>
<td>Film Studies, Mass Communication</td>
<td>$7,371</td>
</tr>
<tr>
<td>Life Sciences – Biotechnology</td>
<td>Biomedical Technology</td>
<td>$9,010</td>
</tr>
<tr>
<td>Public Safety</td>
<td>Law Enforcement</td>
<td>$17,257</td>
</tr>
<tr>
<td>Retail, Hospitality and Tourism</td>
<td>Culinary</td>
<td>$6,485</td>
</tr>
<tr>
<td>Unassigned</td>
<td></td>
<td>$7,188</td>
</tr>
</tbody>
</table>

*Note.* California Community College Chancellor’s Office, LaunchBoard, 2019, retrieved from [https://www.calpassplus.org/Launchboard/SWP.aspx](https://www.calpassplus.org/Launchboard/SWP.aspx)
Literature on Field of Study Choice

Scholarly literature reveals a connection between earnings and major choice from middle school through college; however, CTE community college students have not been the focus of these studies. Researchers have focused on middle school students (Nugent et al., 2015), the general population of community college students (D’Amico, Rios-Aguilar, Salas, & González Canché, 2012), first-generation community college students (Ramirez, 2019), undergraduates in four-year institutions (Arcidiacono, Hotz, & Kang, 2012; Kugler et al., 2017), and college graduates (Montmarquette, Cannings, & Mahseredjian, 2002). These studies provide a useful base for expanding the literature to the influence of earnings concerns on field of study choice for community college CTE students.

Middle School Students

Empirical research by Nugent et al. (2015) approached college choice from the point of view of younger students who were exposed to information about high-wage careers in science, technology, engineering, and mathematics (STEM). Participants were 800 middle school students age 10-14 attending summer robotics camps in 19 states across the US (Nugent et al., 2015). Researchers created a multiple choice and Likert scale survey that assessed prior knowledge, career outcome expectancy, career orientation, self-efficacy, problem-solving, and knowledge as both dependent and independent variables. Camp facilitators administered the surveys. Following data collection, Nugent et
al. (2015) used structural equation modeling (SEM) to examine relationships between constructs and developed a matrix of descriptive statistics and covariance. They found that expected earnings influenced students’ stated career interest, as did perceived benefits such as prestige and self-satisfaction, but a stronger predictor of college choice was self-efficacy (Nugent et al., 2015). Because the participants in the study were in middle school, the study did not examine actual college and field of study choice (Nugent et al., 2015).

**General Population of Community College Students**

D’Amico et al. (2012) conducted an exploratory study of the alignment between the community college experience and careers of interest. To explore factors that informed career interest for community college students, D’Amico et al. (2012) surveyed 84 students at a southern, rural US community college in the fall of 2010. The sample was mostly female (67%), employed (70%), age 24 or younger (66%), and aspired to complete a four-year degree or higher (53%). White students comprised 30% of the sample, and the ethnic breakdown of the other 70% was not provided (D’Amico et al., 2012). The researchers used multiple regression and stepwise backward regression to examine *college-career alignment* (D’Amico et al., 2012, p. 251), defined as having alignment between course work and career goals. Their results indicated that higher college-career alignment occurred for students who did not plan to transfer to a four-year institution, worked part or full time, and used institutional sources (e.g., guidance counselors, school and career websites) for career information (D’Amico et al.,
Female students had higher college-career alignment than did male students, and confidence in finding a job related to the career of interest also predicted high college-career alignment (D’Amico et al., 2012). Interestingly, students who relied on family networks for information about careers showed lower college-career alignment than students who relied primarily on institutional networks (D’Amico et al., 2012). Finally, although D’Amico et al. (2012) noted earnings and living wage attainment in their review of the literature informing college-career alignment, their study did not focus on earnings concerns as a predictor of college, major, or career choice.

First-Generation Community College Students

Ramirez (2019) interviewed 12 participants (7 female, 5 male) in a hermeneutic phenomenological study of first-generation community college students. The study was conducted at a public community college in Southern California, and the purpose was to gain understanding of factors influencing first-generation students in their college major choice (Ramirez, 2019). Ramirez (2019) did not purposefully select students based on economic disadvantage; however, one of the themes that emerged in qualitative data analysis was “a desire to break the cycle of poverty for a better life” (p. iii). Within the context of this theme, first-generation students were influenced by earnings concerns when selecting their college major (Ramirez, 2019). Additional factors included setting a good example, having hope for the future, and achieving their individual educational and career goals (Ramirez, 2019).
Similar to Nugent et al. (2015), Ramirez (2019) found self-efficacy to be important in the overall college and career planning process. Students reported stronger self-efficacy when they felt supported and guided by faculty and when they felt they had gained relevant career knowledge (Ramirez, 2019). These experiences helped first-generation community college students to feel comfortable and confident in their choice of college major (Ramirez, 2019).

**University Undergraduates**

Arcidiacono et al. (2012) surveyed 173 male undergraduate students at Duke University in 2009 and found that both expected earnings and perceived ability were statistically significant factors in choice of college major. Students were asked to estimate future earnings in six broad sectors common among Duke alumni: science/technology, health, business, government/nonprofit, education, and law (Arcidiacono et al., 2012). Students estimated high earnings for the science and business sectors and connected them to majors that would likely lead to careers in those sectors. For example, survey respondents expected that students majoring in economics would likely work in the business sector (Arcidiacono et al., 2012). However, only 20 percent of male undergraduates at Duke were majoring in economics (Arcidiacono et al., 2012). The researchers used a multinomial logit model to analyze survey data and found that earnings would be a key factor in college major choice when abilities were set as equal, but choice of major varied when earnings were set as equal:

> When abilities are set equal, large shifts occur as individuals move away
from the Humanities and the Social Sciences and into Engineering, with some movement also into the Economics major. This occurs because earnings now play a greater role in sorting and because students’ beliefs about their ability to perform well in Engineering are much lower than their beliefs about their abilities to perform well in other majors. In contrast, when earnings are set equal, the share of individuals choosing Humanities and Social Sciences majors increases by 17% and 10%, respectively, with the share choosing Economics as a major falling by 16%. The overall distribution across majors when earnings are equal, however, still leaves no major drawing more than 20% of the students. (Arcidiacono et al., 2012, p. 12)

Later work by Kugler et al. (2017) found earnings to be one of several variables that predicted students changing their major. The researchers used administrative records of 9,180 students who attended a large, selective, private university between 2009 and 2016 to examine factors that contributed to their outcome variable, \textit{switch} (Kugler et al., 2017, p. 10), or change of major. Kugler et al. (2017) were particularly interested in gender differences in \textit{switch} for students who received low grades in major courses. Based on the gender makeup of each major at the university, Kugler et al. (2017) separated majors into female-dominated (e.g., culture and politics, health studies, and sociology), male-dominated (e.g., computer science, economics, global business), and neutral (e.g., biology, government). STEM was added as a fourth category.
because Kugler et al. (2017) hypothesized that STEM majors would show evidence of bias against female students. The STEM category pulled from the other three categories. For example, chemistry (neutral), neurobiology (female-dominated) and physics (male-dominated) were included in the STEM category for purposes of hypothesis testing (Kugler et al., 2017).

Kugler et al. (2017) found that majors associated with high earnings attracted female and male students more than majors with low earnings, both before and after switching. In addition, students across genders considered expected earnings more when the national economy was weak. However, women in STEM majors were more likely to switch out when they received low grades. Moreover, STEM and male-dominated majors led to higher median earnings than female-dominated and neutral majors (Kugler et al., 2017). The researchers suggested that information about median earnings could encourage more women to select majors leading to high wages, but other factors would more effectively address persistence (Kugler et al., 2017). They proposed the concept of *signals of fit*, (Kugler et al., 2017, p. 23) described as cues that students consider when deciding to persist in or switch their major. Signals of fit included gender representation in the major, course grades, high school preparation, socioeconomic background, gender of faculty and classmates, and expected earnings (Kugler et al., 2017). Kugler et al. (2017) found that switch was most common when students received three signals suggesting lack of fit,
for example, (a) mismatch between the student’s gender and the dominant gender in the major, (b) low grades, and (c) inadequate high school preparation.

**College Graduates**

Research by Montmarquette et al. (2002) found a shortage of STEM students compared to available jobs, driving up wages and putting pressure on colleges to produce more STEM graduates. Montmarquette et al. (2002) studied a sample of 562 Canadian students who were between the ages of 14 and 22 in 1979 and completed the 1987 Survey of Recent College Graduates. Montmarquette et al. (2002) disaggregated data by gender and race and found significant gaps in the number of women and students of color pursuing STEM and other careers in high-wage, high-demand areas. Relating their findings to human capital theory, Montmarquette et al. (2002) recommended more efficient use of human capital by elimination of gender and race barriers to field of study choice.

Montmarquette et al. (2002), Nugent et al., (2015), and other researchers from the fields of business and economics have offered human capital theory, couching college choice as an investment decision. Baron and Armstrong (2007) provided an introduction to human capital theory, and Oreopoulos and Petronijevic (2013) provided an application of human capital theory to college choice.
Human Capital Theory

Human capital theory posits that students do a personal cost-benefit analysis to determine whether or not they will invest in education, and if so, what field of study they will pursue (Baron & Armstrong, 2007). From the business perspective, employees comprise an asset because of the resources they bring (Baron & Armstrong, 2007). From the individual perspective, human capital is the property of the holder; that is, each individual brings professional skills, knowledge, and abilities as well as personal, social, and cultural background. Individuals invest in themselves through education to increase their competitiveness in the workforce after analyzing the costs and benefits (Baron & Armstrong, 2007). Simply put, individuals become students when they determine that the benefits of education outweigh the costs. Benefits may include expected earnings, job security, employment in an area of interest, prestige, affinity, or other tangible and intangible rewards (Baron & Armstrong, 2007). Cost is usually expressed in terms of time, money, and effort (Baron & Armstrong, 2007).

Under human capital theory, in order to choose a field of study leading to a living wage, students need knowledge of career options, the ability to do a cost-benefit analysis, and the self-efficacy to believe they can succeed in a field of study leading to a living wage (Montmarquette et al., 2002; Nugent et al., 2015; Oreopoulos & Petronijevic, 2013). Oreopoulos and Petronijevic (2013) criticized applications of human capital theory to educational choice because the theory failed to acknowledge the imperfect and sequential nature of the cost-benefit
Using earnings data from the 2010 Canadian Current Population Survey (CCPS), Oreopoulos and Petronijevic (2013) performed net present value (NPV) calculations to compare estimated college cost to projected future earnings for a hypothetical student. The 2010 CCPS represented a national sample of Canadian adults age 30 through 50 who were employed full time. Oreopoulos and Petronijevic (2013) found net gains for the hypothetical student who chose college regardless of field of study, but they pointed out that most students were not trained to do NPV calculations before entering college. Moreover, students lacked information about projected labor market demand and educational options, and fears of excessive student debt may have led them to underinvest in post-secondary education (Oreopoulos & Petronijevic, 2013). The researchers concluded that the cost-benefit calculation essential to human capital theory was sequential, changing as the student gained information and experience, and rudimentary at best (Oreopoulos & Petronijevic, 2013).

Human capital theory assumes homogeneity (Oreopoulos & Petronijevic, 2013) and does not include sociodemographic variables such as race. In contrast, critical race theory provides a lens through which to view college choice through a social justice lens based on the lived experience of students of color (Darder, Torres, & Baltodano, 2017). Furthermore, LatCrit theory focuses on the experiences of Latinx students (Acevedo-Gil 2017; Darder et al., 2017). In the next section, I discuss LatCrit theory.
LatCrit Theory

LatCrit grew out of critical race theory, which calls attention to systemic racism in education and challenges oppressive power systems (Darder et al., 2017; Solórzano & Yosso, 2001). In LatCrit literature, social justice takes the form of seeing the lived experience of Latinx students and challenging the deficit perspective common to dominant ideology (Acevedo-Gil, 2017; Solórzano & Yosso, 2001). For example, in a qualitative study using testimonio methodology, Farrington (2018) focused on the resilience of a Latinx family supporting each other through their college experience from the 1970s through 1990s. Family was central to the lived experience of the college students (Farrington, 2018).

Similarly, Acevedo-Gil (2017) noted the importance of family in college choice by Latinx students. Acevedo-Gil (2017) applied a LatCrit lens to examine the experience of college choice by Latinx students and noted that “siblings, extended family members, and peers serve as primary information sources” (p. 837).

Acevedo-Gil (2017) also challenged the dominant ideology of equating successful college choice with completion of a linear path. The college choice experience of Latinx students was a nonlinear process “where Latinx students reflect on the college information that they receive in relation to their intersectional experiences” (Acevedo-Gil, 2017, p. 835). In her conceptual model, college-conocimiento (p. 835), Acevedo-Gil (2017) depicted a process whereby students completed seven nonlinear activities: (a) deciding to attend college, (b)
searching for college information, (c) anticipating obstacles, (d) planning and applying to college, (e) choosing a college, (f) conflicts with college, and (g) self-advocacy and peer support. Students completed these activities according to their own experience and often repeated activities (Acevedo-Gil, 2017). Viewing college choice through a LatCrit lens, Acevedo-Gil (2017) challenged the dominant deficit perspective which implied Latinx students lacked interest or preparation for college because their college choice pathway was nonlinear.

In challenging the deficit perspective, LatCrit theory offers a critical race lens through which to view the experiences of Latinx students, a growing proportion of community college students. In 2011-12, students identifying as Hispanic/Latino made up 23.9 percent of US community college students (Radford et al., 2016) and 36.2 percent of CTE enrollments in California (LaunchBoard, 2019). By 2016-17, the percentage of California community college CTE students identifying as Hispanic/Latino was 43.7 percent (LaunchBoard, 2019).

Since 2012, several reforms have been implemented in California to increase access to career education. In the next section, I discuss CTE reforms in California.

Career Technical Education Reforms in California, 2012-2019

By 2012, the disparate aspects of scholarly studies on field of study choice and the lack of research with community college CTE students left a gap in scholarly literature. Researchers attempted to fill the gap while legislators and
policymakers continued to implement reforms. I now discuss CTE reforms in California from 2012-2019 that increased scrutiny of community college CTE programs and led to performance metrics highlighting earnings and living wage.

Career Technical Education Outcomes Survey

In 2012 a group of CCC educators and researchers developed a survey for CTE students in California (Alder, 2013). The CTE Employment Outcomes Survey (CTEOS) was piloted with 12 California community colleges, and in 2013 it became available to all California community colleges (“History CTEOS,” n.d.). The 2018 CTEOS consisted of 33 multiple choice and short answer questions. The survey was administered via email, text message, and telephone to CCC CTE students who were enrolled in the 2015-16 academic year and no longer enrolled in the 2016-17 academic year (“History CTEOS,” n.d.). Surveys were sent to 151,404 students, and 49,660 (32.8 percent) responded, a response rate consistent with prior years (M. Pham, CTEOS statewide director, personal communication, February 22, 2019). The proliferation of the CTEOS represented an opportunity to collect quantitative and qualitative data previously unavailable to the field, including information about the student’s goal when entering college and reasons for exiting. The CTEOS was incorporated into SWP in 2017, and its data became the source of outcomes data for SWP performance metrics that could not be measured by other means (CCCCO, 2018a).
**Strong Workforce Task Force**

In November 2014, CCCCO convened the Board of Governors Task Force on Workforce, Job Creation, and a Strong Economy (Strong Workforce Task Force). By that time, the US and California economies were recovering from the Great Recession, and the California economy was showing strong growth (Garosi & Sisney, 2015). However, all Strong Workforce Task Force members had been involved in California higher education long enough to remember the scarcity of 2009-2012 (Board of Governors Strong Workforce Task Force, 2015). Within that context, the Strong Workforce Task Force was charged with making recommendations for the sake of CCC students as well as business, industry, and the state as a whole:

Far too many Californians do not possess the right skills and education to obtain a good job. Employers in key industries have difficulty filling job openings because the workers with the skills and aptitudes required are in short supply. Unless California immediately begins to address this mismatch, the state’s economic prosperity and the success and income mobility of thousands of Californians are threatened…. The task force, comprised of both internal and external stakeholders, was convened to recommend a series of policies and practices to increase the production of industry-valued degrees and credentials. (Board of Governors Strong Workforce Task Force, 2015, p. 7)
The Strong Workforce Task Force released its report and recommendations in 2015, and the 2017 Strong Workforce Program drew key components directly from the Strong Workforce Task Force Report (Legislative Analyst’s Office, 2018). Task force recommendations became SWP metrics; for example, the Strong Workforce Task Force recommended improvement to CTE student education and employment outcomes, alignment of course offerings with business and industry needs, an increase to the number of community college students who earned an industry-recognized credential, and sustained funding to community college CTE programs to facilitate quick responses to changes in regional economies (Board of Governors Strong Workforce Task Force, 2015). Similarly, SWP performance metrics were based on credential completion, employment in a field related to the CTE program of study, earnings after exiting a CTE program (whether students finished a credential or not), and attainment of a regional living wage (CCCCO, 2018a).

Vision for Success Plan

In 2017 the California Community College Chancellor’s Office (CCCCO) released a five-year strategic plan for the 115 public community colleges in the state (Esch & Supinger, 2017). Among other broad goals and recommendations, the Vision for Success Plan included guided pathways as the preferred model for community college CTE and academic programs across the state (Esch & Supinger, 2017). The Vision for Success plan was the product of a literature review, 50 interviews with internal and external community college stakeholders,
surveys, virtual town hall meetings, and social media comments (Esch & Supinger, 2017). Researchers coded and themed all data (Esch & Supinger, 2017). Of the six goals contained in the resulting Vision for Success plan, one specifically addressed employment and earnings:

> Over five years, increase the percent of exiting CTE students who report being employed in their field of study, from the most recent statewide average of 60 percent to an improved rate of 69 percent – the average among the quintile of colleges showing the strongest performance on this measure and ensure the median earning gains of the exiting students are at least twice the statewide consumer price index. (Esch & Supinger, 2017, p. 16)

This Vision for Success employment goal was similar to Strong Workforce Program (SWP) goals in that it included employment in the student's field of study, did not require completion of a degree or certificate, and compared earnings gains to an established measure of economic wellbeing (Esch & Supinger, 2017). However, the SWP differed from Vision for Success in that the former adopted a regional living wage standard as a benchmark for earnings after CTE instruction.

**Living Wage**

As used by SWP, *living wage* refers to a regional measure of income needed to provide basic needs for one person. To set the SWP living wage standard, CCCCO turned to the *self-sufficiency standard* determined by the
Insight Center for Community Economic Development (Insight CCED). The Insight CCED living wage standard accounts for basic needs by family size and county of residence, with different self-sufficiency minimums for each county in California. The self-sufficiency standard includes housing, child care, food, transportation, health care, and taxes (Pearce & Manzer, n.d.). An additional 10 percent is added to the standard to allow for miscellaneous costs such as clothing, personal items, paper products, nonprescription medications, and household items. For purposes of comparing post-CTE median earnings to a living wage standard, CCCC0 uses Insight CCED’s county self-sufficiency standard for a family size of one (CCCC0, 2018b).

CCCC0 built online tools such as LaunchBoard to capture the data needed to assess SWP performance metrics and developed the online Salary Surfer tool to allow students to consider potential future earnings as they selected a program of study (Booth, 2015).

**Strong Workforce Program**

The 2017 Strong Workforce Program grew from the Strong Workforce Task Force. After suffering deep funding cuts due to the Great Recession of 2007-2009, community colleges were rebuilding programs and services as funding levels were restored (CCC Student Success Task Force, 2012). CCC funding is based on tax revenue from the previous fiscal year; therefore, colleges felt the worst effects of the Great Recession in funding years 2009-2012. Funding cuts led to reduction in the number of class sections available, and
simultaneously, high unemployment rates led to increased demand for community college classes (CCC Student Success Task Force, 2012; Douglass, 2010). Suddenly, community colleges with open access missions found themselves turning away students because of lack of capacity, fully aware that the students had not been provided training in the skills necessary to compete in a limited job market (CCC Student Success Task Force, 2012; Douglass, 2010).

The CCCC Vision for Success plan, Strong Workforce Task Force Report, and Strong Workforce Program all encouraged collaboration with business and industry. Perhaps still smarting from the Great Recession of 2007-2009 (CCC Student Success Task Force, 2012), task force members and other stakeholders promoted alignment of CTE with business and industry and prioritized employment and earnings outcomes for students (Board of Governors Strong Workforce Task Force, 2015). However, scholars have criticized community college occupational education as catering to the needs of business at the cost of student wellbeing (Ayers, 2005; Dougherty, 1994; Levin, 2007). Other critiques have accused the higher education system of diverting students from their aspirations through a process called *cooling out*, whereby colleges guide students to community college CTE if they are perceived as unable to achieve a bachelor’s degree or unwelcome in baccalaureate institutions (Brint & Karabel, 1989; Clark, 1960). I address these criticisms later in the chapter, but first, I describe empirical research on CTE employment and earnings outcomes.
Career Technical Education Employment and Earnings Outcomes

A wide body of research supports employment and earnings gains after CTE. For example, Xu and Trimble (2016) studied 67,735 students enrolled in CTE certificate programs in Virginia and 165,884 in North Carolina. They distinguished between short-term certificates, defined as requiring course work of less than one year, and long-term certificates, defined as requiring course work of one year or more (Xu & Trimble, 2016). Descriptive statistics showed that students in short-term certificate programs were older and more occupationally oriented, although the authors did not operationalize occupationally oriented (Xu & Trimble, 2016). Using an individual fixed-effects model, Xu and Trimble (2016) found overall gains in earnings and employment for students who earned short-term certificates in Virginia, although they noted discrepancies in similar data from North Carolina due to different methods of designing short and long-term certificate programs. There was also significant variation among fields of study and within specific programs (Xu & Trimble, 2016).

Bahr (2016b) found statistically significant earnings gains without a credential for CCC students in subfields of engineering, technology, business, and public services. Noting that most studies focused on earnings gains after credential completion, Bahr (2016b) offered two explanations for his results. First, employers within these subfields may accept college credits taken as a signal of increased human capital, even without a credential. Second, students who took courses in these subfields may have been skills-builders. Skills-builders appear
to purposefully select course work that improves their knowledge and skill in a specific field, as evidenced by their high ratio of earnings gains to credits taken (Bahr, 2013; Booth, 2014).

Circling back to the needs of community college students, the open access mission of community college and the availability of short-term CTE programs fit the employment focus described by Bahr (2010) and Levin (2007) and the occupational education function described by Cohen et al. (2014). The lack of comparisons of earnings gains to a regional living wage benchmark represents a gap in scholarly literature. In addition, the evolution of community college in California and across the United States has spurred scholarly debate about the greater purpose of education. In the next section, I describe critical and favorable views of community college and connect those views with career technical education.

Critical Views of Community College

Clark (1960) and Dougherty (1994) wrote critical views of community college. For Dougherty (1994), community college was contradictory because it granted higher education access to students while simultaneously oppressing them. For Clark (1960), community college was a filtering institution that served to keep students from pursuing bachelors degrees. I provide a brief introduction to Dougherty (1994) and Clark (1960) in this section.
The Contradictory College

Dougherty (1994) described and critiqued three perspectives regarding the role of community college and added his own theory to explain the origin, impact, and vocationalization of community colleges. Functionalist advocates see community college as a democratizing institution; instrumentalist Marxist critics see it as a tool of oppressive capitalism; and institutional theorists see it as a filtering institution (Dougherty, 1994). Dougherty’s (1994) theory of state relative autonomy adds the dimension of government to the function of community college. Below, I briefly summarize Dougherty’s (1994) work and include examples of scholars who have written from each point of view. For scholars not cited elsewhere in the chapter, I include a brief description of how their work reflects their perspective.

Functionalist Advocate. The functionalist advocate view of community college is favorable. Functionalist advocates argue that community college serves a democratizing function by giving a large number of people the opportunity to pursue higher education at a low cost (Dougherty, 1994). Students can pursue vocational training or take lower-division college courses at the community college for transfer to a four-year institution. Regardless of their choice, students enjoy open-door admission to the community college. Because of the open access, low cost, and inclusion of community and continuing education, a significant number of community college students are nontraditional in terms of age, ethnicity, gender, and income. Scholars who wrote from the

**Instrumentalist Marxist.** Instrumentalist Marxism is a school of thought critical to community colleges. Instrumentalist Marxist critics hold that community colleges continue and fortify class inequalities by funneling students into work that benefits the capitalist class. Capitalist business owners receive trained workers at public expense, and students from working-class families are hindered from moving up (Dougherty, 1994). Students from the working class who aspire to enter a higher class through education are not served by community college; on the contrary, the *cooling out* function of community college exists to reinforce existing class structure. Thus, children of working class parents inherit their parents’ position and pass it on to the next generation. Furthermore, selective admissions allow universities to continue to serve elite students from the capitalist class, and the scarcity of bachelor’s degrees is protected (Dougherty, 1994). Ayers (2005) and Levin (2007) wrote from the instrumentalist Marxist point of view.

Ayers (2005) argued that community colleges had become a tool for reproducing social inequality. Paying particular attention to the workforce development function expressed in community college mission statements, Ayers (2005) concluded that community colleges were aligning with neoliberal ideology
which reduced students to a homogenous pool of future workers. Ayers (2005) argued that a focus on workforce development gave business and industry the lead in determining curriculum. Students were nothing more than “passive, economic entities who exist to meet the demands of industry” (Ayers, 2005, p. 544).

Institutional Theory. Institutional theory highlights a filtering role of community college. Brint and Karabel (1989) and Clark (1960) saw community colleges as managers of overly high aspirations held by students who would not achieve their visions of baccalaureate degrees and high-wage, high-status careers. In order to reconcile the high number of students with limited high-paying job opportunities, Brint and Karabel (1989) and Clark (1960) postulated that community colleges systematically guide students to lower their aspirations. As community colleges lower their students’ aspirations, four-year institutions are able to maintain selective admissions. Community colleges fulfill their filtering role by presenting CTE options to students, diverting them from the coveted four-year degree. The community college thus contributes to a segmented society, providing training that keeps their graduates at lower levels of educational and economic attainment than the baccalaureate degree (Brint & Karabel, 1989).

Consistent with the institutional theory perspective, Brint and Karabel (1989) described community college as “the bottom rung of higher education’s structure” (p. 12) and further differentiated CTE as an instrument of social stratification. Brint and Karabel’s (1989) history of vocational (CTE) programs
emphasized oppression of community college students by elitist leaders in business and education, leading to “a vocational-training institution, more and more divorced from the rest of academia, with potentially serious consequences for the life chances of students” (pp. 12-13).

State Relative Autonomy. Finally, Dougherty’s (1994) state relative autonomy perspective captured the stratification of the previous three schools of thought and added the dimension of government. Dougherty (1994) argued that government officials at local, state, and federal levels drove the direction of the community college from the beginning, largely based on personal interest. The perspective of relative autonomy of the state holds that policymakers made decisions about the population to be served and the programs to be offered at community college long before business got involved (Dougherty, 1994). Similarly, the perspective argues that vocationalization of community colleges occurred without regard to student needs, and community colleges often produce too many trained workers in areas not in demand, while leaving too many vacancies in areas that would provide employment opportunities (Dougherty, 1994).

The response to criticism of the community college has come from the functionalist advocate point of view. Hirschy et al. (2011) brought student choice to the forefront, proposing a conceptual model by which students’ achievement of their individual educational goals was considered a success. Alder (2013) studied employment outcomes of 885 former community college CTE students in
California and interviewed 11 students from the same sample. Students showed employment and earnings gains, and their interview responses revealed benefits such as fostering a love of learning and passion for their careers (Alder, 2013). Perhaps the most direct response came from Leigh and Gill (2003, 2004), who analyzed data from the 1979-1996 National Longitudinal Survey of Youth (NSLY) and found that attending community college led to higher educational aspirations and attainment. Leigh and Gill (2003) contrasted the “diversion effect” (p. 23) described by Brint and Karabel (1989) with the “democratization effect” (p. 23) of community college. Proponents of the democratization effect view community college as increasing opportunity for students (Leigh & Gill, 2003).

Finally, although he did not embrace the functionalist advocate point of view, Clark (1980) resisted criticism of the community college in an essay subsequent to his seminal work on cooling out (Clark, 1960).

**Cooling Out**

Open access has been the center of scholarly debate about the underlying mission of community college. In 1960, Burton Clark used the term *cooling out* (Clark, 1960, p. 569) to describe a filtering function of community college. Clark (1960) adopted the term from an article by Goffman (1952) who used it to describe a process by which victims of a scam were placated so they would not retaliate or alert the authorities. As used by Clark (1960), cooling out is a function of the community college whereby students who are not seen as likely to succeed in four-year institutions are directed to educational alternatives that do
not require a four-year degree. Clark (1960) described cooling out as gradual guidance by institutional advisors or counselors. Clark (1980) revisited the term in subsequent work, emphasizing his view that because of the open access mission of the community college, cooling out was the best of many poor options:

Any system of higher education that has to reconcile such conflicting values as equity, competence, and individual choice – and the advanced democracies are so committed – has to effect compromise procedures that allow for some of each. The cooling out process is one of the possible compromises, perhaps even a necessary one. (p. 30)

Clark (1980) described research that expanded the original meaning of cooling out to include institutional bias based on gender (K. M. Moore, 1975), class (Karabel, 1972), and race (Karabel, 1972). Clark (1980) resisted demonization of the community college and characterized such interpretations of his work as a distortion:

[T]he most prevalent abuse of the concept of cooling out has been its confusion with casting out…. One of the major drawbacks to the cooling out terminology is that its catchiness encourages such distortion. (p. 25)

Clark (1960, 1980) discussed the dilemma of serving all students while maintaining the academic integrity of post-secondary education. He listed possible alternatives to cooling out, such as selection of four-year university students in high school, allowing students to fail in open access four-year institutions, instituting a policy of guaranteed bachelor’s degrees, and blurring the
line between transfer and non-transfer curricula (Clark, 1980). Clark (1980) found benefits and drawbacks to each alternative, concluding that every approach ultimately faced the question of how to serve all interested students while insisting on the societal prestige and economic value associated with a bachelor’s degree.

Clark’s (1980) discussion of cooling out also referred to research on a counter phenomenon, termed *warming up* (Clark, 1980, p. 24). Clark (1980) cited research by Baird (1971) whose survey of 2,500 community college students found evidence of institutional encouragement of students to pursue a four-year degree, even if they had not originally planned to do so. Similarly, Bahr (2008) reported higher persistence rates by students who used community college advising, suggesting that institutions were warming up rather than cooling out their students.

To test Clark’s (1960) cooling out proposition, Bahr (2008) studied transcript data from California community college students who took remedial math (N=30,118) and/or stated their intention to transfer (N=68,241). Subjects were first-time community college students in fall 1995, and Bahr (2008) studied their progress through spring 2001. Using discrete-time event history analysis via hierarchical logistic regression, Bahr (2008) tested four hypotheses related to advisor-driven cooling out: 1) Advisors would cool out students in remedial education; 2) Cooling out would happen most with students in the lowest remedial courses; 3) Cooling out would happen more with Black and Hispanic
students than with White students; and 4) Cooling out would happen proportionately with the Black, Hispanic, and remedial population of the institution.

For the most part, Bahr’s (2008) findings did not support his hypotheses. For the first and second hypotheses, Bahr (2008) found that students in remedial math who participated in advising advanced to the next level math course at a statistically significant, higher rate than those who did not, regardless of their beginning math level. Similarly, students who participated in advising transferred at a statistically significant, higher rate than students who had no advising (Bahr, 2008).

Bahr’s (2008) third hypothesis, that advising would reflect institutional racism, showed mixed results. Advising had a net positive effect on completion of remedial math for Black, Hispanic, and White students and was ambiguous for Asian students (Bahr, 2008). Advising showed a significant, positive effect on transfer for all students, but the effect was significantly less for Black students than for White students (Bahr, 2008).

For the fourth hypothesis, Bahr’s (2008) findings did not show significant variance based on institutional demographics for completion of remedial math. For transfer, however, Bahr (2008) found mixed results. For institutions with a high percentage of Hispanic students, the benefit of advising was reduced for Hispanic students (Bahr, 2008). For institutions with a high percentage remedial students, the benefit of advising on transfer increased.
Bahr (2008) concluded that his findings did not support Clark’s (1960) thesis that cooling out was associated with advising. Bahr (2008) noted the availability of population data as a strength of his study, and cited as weaknesses the absence of data from outside California and the exclusion of variables such as credit course load, part time or full time employment, first-generation status, and parenting status. He also noted a possible source bias in the data for students who completed their remedial math sequence slowly. Such students would appear to be more at risk than students who completed their remedial sequence quickly, possibly inflating the effect of advising for remedial math students (Bahr, 2008).

Bahr’s (2008) findings of increased course completion for college students who sought advising supported the democratization effect discussed by Leigh and Gill (2003) and reflected the functionalist advocate point of view discussed by Dougherty (1994). As mentioned previously, the conceptual model created by Hirschy et al. (2011) also reflected the functionalist advocate point of view and provided the conceptual framework for this study. In the next section, I provide additional explanation of the conceptual framework.

Conceptual Framework

The conceptual model by Hirschy et al. (2011) built upon previous models of student success to incorporate CTE student characteristics. Noting that earlier models were based on the experiences of traditional college students in academic majors, Hirschy et al. (2011) critiqued the models for failing to include
CTE. They argued that failure to include CTE majors represented a failure “to acknowledge the multiple missions of community college” (Hirschy et al., 2011, p. 297) and that a more thorough understanding of CTE students could lead to more effective interventions and higher student success for this population. As defined by Hirschy et al. (2011), student success (p. 301) was synonymous with educational goal attainment (p. 301) and must take into account the varied intentions of CTE students, which were often unknown. For example, Hirschy et al. (2011) pointed out that in order to qualify for federal financial aid, students had to state a goal of degree or certificate completion; however, the majority of CTE students later left college without completing a degree or certificate. The consistent mismatch between stated goal and eventual outcome had been interpreted as individual and institutional failure, but Hirschy et al. (2011) proposed inclusion of employment and earnings outcomes and further research to explore CTE students’ educational intentions at entry. As mentioned previously, the CTEOS includes a question on students’ educational goal at entry (“History CTEOS,” n.d.).

Similar to Hirschy et al. (2011), Kezar et al. (2015) challenged traditional models of student success. In their study of low-income students, Kezar et al. (2015) criticized traditional models as unresponsive and suggested an anti-deficit approach to low-income student engagement. In their model, Kezar et al. (2015) viewed low-income students as “hard-working, strategic, responsible, creative problem-solvers who are juggling many competing demands” (p. 238). They
placed the onus on the institution to schedule classes and activities at times that did not interfere with the student’s work schedule, infuse cultural relevancy into course content, critically examine course costs such as textbooks and enrichment activities, and provide early warning systems and easily accessible support for students who struggled to keep up with course work (Kezar et al., 2015).

Figure 1 depicts the conceptual model proposed by Hirschy et al. (2011). The four interrelated constructs of student characteristics, college environment, local community environment, and student success represent the realms in which students operate. Student characteristics are individual, such as age, marital status, and high school record, and often unseen, such as self-efficacy and employment goals. Student characteristics and student success influence each other, illustrated by the two-way arrow between the constructs. A second two-way arrow connects student characteristics with college environment, linking the four constructs in a fluid and interrelated relationship.
As discussed previously, Hirschy et al. (2011) equated student success with educational goal attainment. Students’ goals may not match institutional goals, and they evolve over time. Hirschy et al. (2011) discussed varied and changing goals as a common occurrence with CTE students and criticized previous theoretical models for viewing the process through a deficit lens.

The third construct, college environment, encompasses institutional forces such as the availability of universal design, pathways, and specialized services on campus. It also includes an overlapping source of support or challenge for students, career integration. Hirschy et al. (2011) operationalized career integration as “meaningful career-related experiences [that] may occur on and off campus and because the boundaries between school and work may be permeable” (p. 312). The researchers highlighted the link between college and community by placing career integration in both their third and fourth constructs. Hirschy et al. (2011) emphasized career integration as central to the success of CTE students, noting the importance of career socialization as part of their college experience. Finally, the fourth construct, local community environment, contains community supports such as work, family, and community-based support (Hirschy et al., 2011).

In this study, I use a functionalist advocate lens and the conceptual model proposed by Hirschy et al. (2011) to examine and explore factors that influence community college students who select CTE fields of study leading to high,
medium, and low median wages. I examine the significance and strength of earnings concerns as a predictor of field of study choice.

Summary

In this chapter, I synthesized the literature regarding community college CTE choice, earnings, and living wage. I began with the history and background of CTE in the US and California and discussed recent changes in legislation, especially in California, that brought living wage closer to the forefront of the discussion. I described the guided pathways model and called attention to literature supporting employment as a measure of student success. I noted the absence of scholarly literature comparing earnings gains after CTE to a regional living wage benchmark, even though a wide body of literature reports earnings gains after CTE study. I described community college and CTE students, who are generally older than four-year and non-CTE students and fit established definitions of nontraditional (Levin, 2007). I summarized literature describing CTE fields of study, noting the wide variation of median earnings outcomes by field of study. Finally, I noted a gap in the literature addressing the factors influencing community college CTE students when they choose a field of study.

My review of the literature included discussion of critical views of community college and CTE. I discussed the functionalist advocate, instrumentalist Marxist, institutional theory, and theory of state relative autonomy proposed by Dougherty (1994). I explained Clark’s (1960, 1980) seminal work on cooling out and subsequent clarification of the popular term. I related the
functionalist advocate view to the conceptual model by Hirschy et al. (2011),
which I used as the conceptual framework for this study.
CHAPTER THREE
RESEARCH DESIGN AND METHODOLOGY

Introduction

In this chapter, I describe the research design and methodology for my study. Drawing on Creswell (2014), I use the deficiencies model to introduce my study. The deficiencies model introduces the study by stating the research problem, briefly reviewing literature and deficiencies relevant to the research problem, discussing the significance of the study, and stating the purpose of the study (Creswell, 2014).

After introducing my study, I relate my design to the conceptual framework by Hirschy et al. (2011) as described in the previous chapter. I cite literature to justify my research design, and I describe the instrument I created for data collection. I describe the process undertaken to verify validity and reliability of the instrument and provide results of pilot testing. Finally, I discuss all aspects of the study including setting, sample, data collection, validity and reliability, trustworthiness, data analysis, and my positionality.

Research Problem

Even after completing their studies at community college, many students enter the workforce and earn less than the living wage (Bahr, 2016a, 2016b; Booth, 2015). While earnings generally increase after college completion and students gain nonfinancial benefits in addition to increased earnings (Oreopoulos
arrival at the living wage immediately after college is an elusive goal for many community college graduates (Bahr, 2016a, 2016b; Booth, 2015; LaunchBoard, 2019). In fact, according to 2018 data from all public community colleges in California, only 53 percent of community college students entered a job that paid a living wage within three years of exiting the community college (LaunchBoard, 2019).

Recent changes to performance measures for Career Technical Education (CTE) programs at California Community Colleges (CCCs) have focused on post-college earnings (CCCCO, 2018b). Starting with the 2017-2018 fiscal year, post-college earnings are included in performance metrics that determine CTE funding for colleges, districts, and regions (Roberts, Leufgen, & Booth, 2018). Although there is a mechanism in place to measure post-college earnings, there is no system in place to compare post-college earnings to the educational goal(s) held by students when they entered CTE programs of study. Moreover, the factors influencing the student’s choice of field of study are not considered in the funding formula. Consideration of such factors is important because earnings vary for different fields of study (Bahr, 2016a; Oreopoulos & Petronijevic, 2013). For example, in his study of 1.1 million CCC alumni, Bahr (2016a) found higher quarterly median earnings in the public and protective services sector ($4,439 above the median for all sectors) than for the family and consumer sciences sector ($30 below the median). If potential earnings were the only factor
students’ choice of field of study, it would be difficult to explain why students pursue fields of study that lead to careers with lower earnings.

**Literature and Deficiencies**

As discussed in the previous chapter, there is much support in the scholarly literature for earnings gains after CTE, with significant variation by field of study (Bahr, 2016a, 2016b; Booth, 2014; Xu & Trimble, 2016). In addition, there is evidence that students consider earnings when selecting a college major. D’Amico et al. (2012) found that community college students related employment goals to a desire to get a baccalaureate degree. Arcidiacono et al. (2012) surveyed 173 male undergraduates at Duke University and found that students’ choice of major was influenced by their earnings expectations and perceived abilities. Ramirez (2019) interviewed 12 first-generation community college students and reported a theme of wanting to “break the cycle of poverty for a better life” (p. 68). Students were mindful of earnings when they chose their major (Ramirez, 2019). Kugler et al. (2017) found that high earnings attracted undergraduates to certain majors regardless of gender, and that students were more likely to consider earnings when the national economy was weak. Nugent et al. (2015) found similar results for middle school students, whose self-reported future plans were influenced by earnings expectations.

These studies shed light on the influence of earnings on choice of college major, but they did not focus on community college CTE students. There is little
information about how community college CTE students come to select their field of study.

Significance of the Study

The question of how earnings influence (or fail to influence) field of study choice for community college CTE students is important for two reasons. First, CTE students are more likely than their four-year college peers to be economically disadvantaged, students of color, and financially responsible for themselves and their families (Radford et al., 2016). Learning more about the factors that affect field of study choice could inform strategies to help students maximize the benefits they stand to gain from higher education. Second, post-college earnings are a performance metric for community college CTE programs. Performance metrics affect funding at both the federal and state levels. If community college CTE programs are unable to meet their performance metrics, their funding may be lowered, ultimately affecting CTE students.

Purpose Statement

The purpose of this study was to examine factors influencing community college CTE students in their field of study choice. The problem to be addressed was twofold: (1) California community college CTE performance metrics include earnings goals, but there was little research to inform the performance metric; and (2) CTE students, who are disproportionately economically disadvantaged, pursue fields of study that do not lead to a living wage. While earnings are not
synonymous with student success (Hirschy et al., 2011), it is unclear whether students pursue low-wage fields of study for personal reasons or because of systemic barriers (Bailey et al., 2015; Brint & Karabel, 1989; Clark, 1960; Dougherty, 1994; Kugler et al., 2017; Levin, 2007).

Research Questions

Drawing on Creswell (2015), I formulated research questions to reflect the purpose and design for this study. My research questions were:

1. What factors do students consider when they choose their CTE field of study at a community college?
2. Are earnings a significant and strong factor in CTE students’ field of study choice?
3. What results emerge when comparing open-ended survey responses to results from quantitative analysis regarding factors influencing field of study choice for community college CTE students?

Research Design

I drew on Hirschy et al. (2011) for my conceptual framework and Johnson and Onwuegbuzie (2004) for my research design. This study employed a within-stage mixed model design as described by Johnson and Onwuegbuzie (2004). The within-stage mixed model design aligned with my pragmatic worldview. In this section, I describe the conceptual framework, within-stage mixed model design, and pragmatic approach that guided my study.
Conceptual Framework

Ravitch and Riggan (2016) stressed the importance of the conceptual framework for clarifying “how and why we have chosen to study a topic” (p. 27). As discussed in the previous chapter, the conceptual framework proposed by Hirschy et al. (2011) included interrelated constructs of student characteristics, college environment, local community environment, and student success. Student success, synonymous with student-defined educational goal attainment, both influenced and was influenced by each of the other constructs.

My main interest was the effect of earnings concerns on field of study choice. In the conceptual model of Hirschy et al. (2011), earnings fall under employment intentions / goals, a malleable variable under the student characteristics construct.

As discussed in the previous chapter, scholarly literature suggests that factors other than earnings influence field of study choice (Montmarquette et al., 2002; Nugent et al., 2015; Oreopoulos & Petronijevic, 2013; Ramirez, 2019). The conceptual model by Hirschy et al. (2011) encompasses influences other than earnings, and I used their model to select variables for comparison.

I employed the conceptual framework in a manner similar to Morgan et al. (2015), who used Hirschy et al. (2011) as the conceptual framework for their study of CTE student persistence in career clusters. As in Morgan et al. (2015), my study did not include all variables listed by Hirschy et al. (2011). Of particular importance in my study are variables within the student characteristics construct.
and the career integration variable (Hirschy et al., 2011).

The student characteristics construct included stable attributes such as race/ethnicity, age, marital status, and commitment to work and family (Hirschy et al., 2011). Student characteristics also included malleable variables such as career knowledge, career network, and educational and employment goals (Hirschy et al., 2011). Malleable variables “may be influenced by the college environment” (Hirschy et al., 2011, p. 310). My research problem and the significance of my study are specific to earnings goals, which fall under malleable variables within the student characteristics construct.

The career integration variable included exposure to the job or career, interactions with professionals in the field, and work experience such as internships and practicum (Hirschy et al., 2011). I included career integration as a variable in my quantitative analysis.

Within-stage Mixed Model Design

For this study, I employed a within-stage mixed-model design where quantitative data were collected via fixed response survey items and qualitative data were collected via open-ended survey items (Johnson & Onwuegbuzie, 2004). This design was an example of mixed methods research described by Johnson and Onwuegbuzie (2004):

An example of a within-stage mixed-model design would be the use of a questionnaire that includes a summated rating scale (quantitative data collection) and one or more open-ended questions (qualitative data
Johnson and Onwuegbuzie (2004) divided mixed methods research into two typologies: (a) mixed-model design, and (b) mixed-method design. The difference between the two typologies has to do with stages and phases (Johnson & Onwuegbuzie, 2004). Stages (p. 19) are steps in the research process, such as establishment of the research objective, data collection, and data analysis. The mixed-model design (Johnson & Onwuegbuzie, 2004, p. 20) mixes qualitative and quantitative approaches within or across the stages of a research project. In contrast, a mixed-method design (Johnson & Onwuegbuzie, 2004, p. 20) has separate phases, one quantitative and the other qualitative.

Johnson and Onwuegbuzie (2004) described mixed methods research as a continuum between quantitative and qualitative research and encouraged full use of the continuum. They saw mixed methods research as a broad methodology that “truly opens up an exciting and almost unlimited potential for future research” (Johnson & Onwuegbuzie, 2004, p. 20). In later work, Johnson, Onwuegbuzie, and Turner (2007) referred to Johnson and Onwuegbuzie (2004), further explaining their goal “to provide a very broad middle position for mixed methods research rather than a more narrow middle position” (p. 122). Johnson et al. (2007) also provided their definition of mixed methods research:

Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints,
data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration. (p. 123)

I administered a survey that included both fixed response (quantitative) and open-ended (qualitative) items (Johnson & Onwuegbuzie, 2004; Krosnick & Presser, 2010). Fixed response items provided information on domains that were measured and analyzed (Krosnick & Presser, 2010), and open-ended items allowed more room for participants’ meanings (Krosnick & Presser, 2010; Saldaña, 2016). I describe the questionnaire later in the chapter and provide the entire survey in Appendix A.

Pragmatic Approach

Mixed methods research is appropriate when approaching research from a pragmatic philosophical orientation (Johnson & Onwuegbuzie, 2004; Mertens, 2005). As explained in my positionality statement, my work in community college CTE influences my interest in outcomes, which is consistent with a pragmatic philosophical orientation. According to Mertens (2005):

[P]ragmatists consider the research question to be more important than either the method they use or the worldview that is supposed to underlie the method. These researchers use the criterion “what works?” to determine which method to use to answer a specific research question. (p. 294)

Furthermore, Mertens (2005) cited earlier work by Tashakkori and Teddlie (1998) describing the influence of values in the pragmatic approach:
Pragmatists decide what they want to research, guided by their personal value systems; that is, they study what they think is important to study. They then study the topic in a way that is congruent with their value system, including variables and units of analysis that they feel are the most appropriate for finding an answer to their research question. (p. 295)

In sum, mixed methods research aligns well with pragmatism and was most suitable for answering my research questions. The mixed-model within-stage design of this study reflected my pragmatic philosophical orientation and addressed my research questions.

Research Setting

The setting for this study was a community college in San Bernardino County in the Inland Empire region of Southern California. I selected San Bernardino County for access to CTE students and because of its large proportion of economically disadvantaged residents and residents of color (“U.S. Census Bureau QuickFacts,” n.d.). In 2018, San Bernardino County was home to approximately 2.2 million residents in 719,000 households (“U.S. Census Bureau QuickFacts,” n.d.). San Bernardino County is the largest county in the contiguous United States by geographical area, covering more than 20,000 square miles. San Bernardino County is geographically diverse, spanning urban and rural areas, mountains, and deserts (“County of San Bernardino Open Governance,” n.d.). Median per capita income was $22,867 in 2018, and median household income was $57,156, both lower than surrounding counties (“U.S.
The number of residents holding Bachelor's degrees or higher was 19.8%, also lagging behind surrounding counties ("U.S. Census Bureau QuickFacts," n.d.). The county was ethnically diverse, with 2018 data showing 53.4% Hispanic/Latino, 28.6% White, 9.4% Black/African American, 7.6% Asian, 3.5% more than one ethnicity, 2.1% American Indian or Alaskan Native, and 0.5% Native Hawaiian or Pacific Islander ("U.S. Census Bureau QuickFacts," n.d.). More than one-third (33.6%) of residents were age 18 and under, and 11.3% were age 65 and over. The largest industries in San Bernardino County were manufacturing, health care, wholesale and retail sales, and food service ("U.S. Census Bureau QuickFacts," n.d.). When the survey was administered in July through September 2019, the annual living wage for San Bernardino County was $24,376 for one adult, $49,008 for one adult and one infant, and $48,085 for two adults and one school-aged child (Pearce & Manzer, n.d.).

Research Sample

I used a stratified sample of 200 students (N=200) studying CTE at a public community college in San Bernardino County. Referring to Table 4 from the previous chapter, I separated fields of study into high, medium, and low wage by median quarterly earnings. I defined high wage fields of study as those that exceeded the regional living wage for a family of two adults and one school-aged child (Pearce & Manzer, n.d.). I defined low wage fields of study as those that showed median wages at or below 110 percent of the regional living wage.
for one adult (Pearce & Manzer, n.d.). I defined *medium wage* fields of study as those that showed median wages between 110 percent of the regional living wage for one adult and the regional living wage for two adults and one school-aged child (Pearce & Manzer, n.d.). To allow data analysis using parametric tests, I ensured that each group (high wage, medium wage, low wage) had a sample size of no fewer than 30 students (Elliott & Woodward, 2007; Pallant, 2010; Salkind, 2017).

As shown in Table 5, the *self-sufficiency standard* (Pearce & Manzer, n.d.) for one adult in San Bernardino County was $6,094 per quarter at the time of this study. No field of study in my sample showed earnings below $6,094 per quarter (LaunchBoard, 2019). To examine fields of study at each median wage level (low, medium, and high), I multiplied the self-sufficiency standard for one adult by 110 percent, as shown below.

\[ \$6,094 \times 110\% = \$6,703 \]

I used 110 percent as my benchmark for low wage. Thus, fields of study showing median earnings at or below $6,703 per quarter met my definition of *low wage*. For two adults and one school-aged child, the *self-sufficiency standard* in San Bernardino County was $12,024 per quarter. Fields of study showing median wages above that level met my definition of *high wage*, and *medium wage* fields of study fell between the two.
Table 5

**Career Technical Education Industry Sectors in California, by Earnings**

<table>
<thead>
<tr>
<th>Low Wage Fields of Study</th>
<th>Medium Wage Fields of Study</th>
<th>High Wage Fields of Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Median quarterly earnings at or below $6,703)</td>
<td>(Median quarterly earnings $6,704 - $12,023)</td>
<td>(Median quarterly earnings $12,024 or more)</td>
</tr>
<tr>
<td><strong>Industry Sector</strong></td>
<td><strong>Examples of Field(s) of Study</strong></td>
<td><strong>Median Quarterly Earnings 6 Months after 2015-16 Exit</strong></td>
</tr>
<tr>
<td>Education and Human Development</td>
<td>Teacher Assistant, Child Development</td>
<td>$6,196</td>
</tr>
<tr>
<td>Retail, Hospitality and Tourism</td>
<td>Culinary</td>
<td>$6,485</td>
</tr>
<tr>
<td>Medium Wage Fields of Study</td>
<td>Information and Communication Technologies (ICT) and Digital Media</td>
<td>Film Studies, Mass Communication</td>
</tr>
<tr>
<td></td>
<td>Advanced Manufacturing</td>
<td>Industrial Systems Technology, Machining</td>
</tr>
<tr>
<td></td>
<td>Life Sciences – Biotechnology</td>
<td>Biomedical Technology</td>
</tr>
</tbody>
</table>

85
<table>
<thead>
<tr>
<th>Energy, Construction and Utilities</th>
<th>Water and Wastewater Technology</th>
<th>$12,231</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health (Nursing)</td>
<td>Nursing</td>
<td>$15,345</td>
</tr>
<tr>
<td>Public Safety</td>
<td>Law Enforcement</td>
<td>$17,257</td>
</tr>
</tbody>
</table>


Data Collection

After securing Institutional Review Board approval from California State University, San Bernardino and the community college, I contacted the Institutional Research Office (IRO) and faculty at my target college to request survey administration either online or in person. The use of different survey modes was intended to maximize response rates (Fan & Yan, 2010). The online survey option consisted of a link to the *Choice of College Major Survey* (CCMS) via Google forms, which students received from the IRO or faculty. The IRO and faculty sent an email invitation to students, which is included in Appendix C. The in-person option was available for students who preferred it. I scheduled a date convenient to the students and faculty and administered a paper version of the survey to 64 students. All students were able to complete the survey in 20 minutes or less (Fan & Yan, 2010; Krosnick & Presser, 2010).

All students in the class were invited to participate, but participation in the
survey was not a class requirement. Students who completed the survey were offered the opportunity to enter into a drawing for one of six $30 Amazon gift cards. Students who wished to participate in the drawing provided their email address for purposes of contacting the winners of the drawing. Student email addresses were separated from survey responses prior to data analysis and were deleted after the gift cards were awarded.

Neither the faculty member nor other students in the class knew who completed the CCMS and who opted out. Only students who had the link or were present when the paper survey was administered were able to take the survey. Students had the option to take the survey on paper or on their computer, tablet, or phone.

Approximately 445 students were given the opportunity to take the CCMS, and students submitted a total of 214 surveys. First, the IRO emailed the invitation (Appendix C) to 227 students who registered for at least one CTE class in the summer of 2019. Of these, 17 responded online, and no student requested a paper survey. At the beginning of fall semester 2019, I contacted faculty chairs of departments representing low (L), medium (M), and high (H) wage fields of study and was able to connect with faculty in five fields of study to request administration of the CCMS. The five fields of study were culinary (L), diesel (M), human services (L), nursing, (H), and police academy (H). Faculty from these fields of study sent the CCMS invitation to their students, and I arranged a date when I could administer the CCMS in person outside of
instructional time. A total of 218 students received the invitation from faculty. Of these, 133 responded online, and 64 submitted paper surveys.

For students who submitted survey responses online, I exported the raw data from fixed response items to SPSS for data analysis, and I exported the responses to the open-ended questions to Excel for manual coding and theming. For students who took the paper survey, I entered the data manually into SPSS (fixed response items) and Excel (open-ended questions).

**Instrument**

For this study, I created an original instrument entitled *Choice of College Major Survey* (CCMS). Before deciding to create my own instrument, I looked for instruments that had been tested for validity and reliability with a large, statewide data set. First, I found secondary data from LaunchBoard (2019) that included data from the CTE Outcomes Survey (CTEOS). I examined the CTEOS survey items and spoke to the CTEOS statewide director regarding my research questions and possible use of CTEOS data (M. Pham, CTEOS statewide director, personal communication, February 22, 2019). While helpful, neither LaunchBoard nor the CTEOS directly addressed my research questions.

Next, I examined publicly available data from my target college’s latest administration of the Community College Survey of Student Engagement (CCSSE), a national survey that meets rigorous reliability and validity testing. I examined the key findings from the 2016 administration of the CCSSE, which are published on the college website (“Surveys,” n.d.). Again, the tool and
findings were informative, but they were not directly related to my research questions.

Finally, I consulted findings from the 2017-2018 Student Campus Climate Survey, an annual survey administered at my target college ("Surveys," n.d.). The first two sections of the Student Campus Climate Survey (SCCS) asked about students’ reasons for enrolling at that college. There were 11 fixed response items and one open-ended item asking for clarification and further explanation of the fixed response item responses. The fixed response item was, “Please indicate whether each of the following items was a major reason, a minor reason, or not a reason in your decision to enroll in classes at [this college]” ("Surveys," n.d.). Students rated fixed response items on a 3-point scale with (1) Most important reason, (2) Minor reason, and (3) Not a reason ("Surveys," n.d.). The 2017-2018 administration of the Student Campus Climate Survey (SCCS) had 532 responses (N=532), and analysis of the data was not provided ("Surveys," n.d.). The SCCS was similar to my research questions in that it asked about students’ motivation for enrolling; however, it differed from my research questions in that it did not ask about field of study choice. I adjusted three fixed response items from the SCCS for inclusion in pilot testing of the CCMS: (a) Convenient location, (j) Advice from parents, relatives or friends, and (k) Advice from high school counselor, teacher or principal ("Surveys," n.d.). Table 6 shows how the items were adjusted from the SCCS to the CCMS.
Table 6

Choice of College Major Survey Items Based on Student Campus Climate Survey Items

<table>
<thead>
<tr>
<th>SCCS item</th>
<th>CCMS item(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Convenient location</td>
<td>I chose this college because the location is convenient.</td>
</tr>
<tr>
<td>(j) Advice from parents, relatives, or friends</td>
<td>I chose this major because of influence from my parents.</td>
</tr>
<tr>
<td></td>
<td>I chose this major because of influence from other relatives.</td>
</tr>
<tr>
<td></td>
<td>I chose this major because of influence from friends.</td>
</tr>
<tr>
<td>(k) Advice from a high school counselor, teacher</td>
<td>I chose this major because of influence from a high school counselor.</td>
</tr>
<tr>
<td>or principal</td>
<td>I chose this major because of influence from a high school teacher.</td>
</tr>
<tr>
<td></td>
<td>I chose this major because of influence from a high school principal.</td>
</tr>
<tr>
<td></td>
<td>I chose this major because of influence from another high school employee.</td>
</tr>
</tbody>
</table>

*Note.* SCCS items are from the 2017-2018 Student Campus Climate Survey, Retrieved from “Surveys,” n.d.

To address my research questions, I created the CCMS. The work of Krosnick and Presser (2010) and Saldaña (2016) informed the design of the instrument, and the work of Hirschy et al. (2011) and Saldaña (2016) informed the content. The full CCMS is provided in Appendix A.
The CCMS is divided into three domains: (1) student characteristics, (2) demographic information, and (3) short answer (see Appendix A). The student characteristics and demographic information domains fit within my conceptual framework, as Hirschy et al. (2011) included a sociodemographic variable within the student characteristics construct. The short answer items comprise the qualitative stage of the study and were designed to corroborate the quantitative (fixed response) survey items, a process called paradigmatic corroboration (Saldaña, 2016, p. 26). Paradigmatic corroboration happens when “quantitative results of a data set do not simply harmonize or complement the qualitative analysis but corroborate it” (Saldaña, 2016, p. 26). Following McCammon, Saldaña, Hines, and Omasta (2012), I created open-ended items with similar language to the fixed response survey items. For example, for the predictor variable of earnings concerns, the closed and open-ended survey items were:

(4) I thought about earnings when I chose my major.

[choose one:]

1 – Strongly Disagree
2 – Disagree
3 – Neutral
4 – Agree
5 – Strongly Agree

(39) To what extent did you consider your future earnings when you chose your major?
The fixed response item was designed to test my predictor variable, and the open-ended item was designed as a related, follow-up prompt (Saldaña, 2016).

Reliability and Validity

The CCMS was designed in accordance with established standards and best practices. I followed the guidance in Krosnick and Presser (2010) and used straightforward syntax and structure. Survey items were short, written in plain language, and organized within related domains (Krosnick & Presser, 2010). I avoided double-barreled items and overlapping categories, and early questions were designed to build rapport (Krosnick & Presser, 2010). To maximize reliability, fixed response items were rated on a 5-point Likert scale and included a neutral option (Krosnick & Presser, 2010).

To minimize threats to validity due to selection bias, I followed Krosnick and Presser (2010) and Fan and Yan (2010). Students had the option to complete the survey online via Google forms, on in person on paper. In addition, the survey was administered once during summer semester and again during fall semester. The use of different survey modes in different semesters was intended to increase validity by maximizing response rates and increasing the likelihood of a representative sample (Fan & Yan, 2010). I also designed the CCMS with awareness of high salience (i.e., the students were interested in the topic) and the length of the survey (Fan & Yan, 2010; Krosnick & Presser, 2010). All students were able to complete the CCMS in 20 minutes or less (Fan & Yan, 2010; Krosnick & Presser, 2010).
Prior to piloting the CCMS, I had the survey reviewed by two external reviewers not familiar with my study. The reviewers were doctoral students who are professionals in the field of education. Using a rubric based on best practices from Krosnick and Presser (2010), the external reviewers provided feedback on survey design, clarity and relevance of domains, survey items, demographic items, and quality of writing.

After external review and prior to administering the CCMS, I piloted the survey with community college CTE students. The pilot CCMS had three domains: 1) student characteristics, which consisted of 34 Likert items; 2) sociodemographic, which consisted of six demographic items; and 3) six open-ended items, which were the qualitative part of the study. I tested the student characteristics domain and did not perform statistical analysis on the demographic or qualitative items.

The survey was piloted with 40 students and was found to have an overall Cronbach’s alpha reliability coefficient of .866, which is above the acceptable reliability coefficient of .70 (Field, 2013). I also examined corrected inter-item correlation for each item and found most to meet the acceptable standard of ≥.30 (Field, 2013). However, I removed several items that showed low inter-item correlation. The removed items are listed in Table 7. After removing the items in Table 7, I found an overall Cronbach’s alpha reliability coefficient of .874.
Table 7

*Items Removed from the Choice of College Major Survey after Pilot Testing*

<table>
<thead>
<tr>
<th>Item</th>
<th>Corrected Item-Total Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can overcome any obstacles to completing my educational goals.</td>
<td>.062</td>
</tr>
<tr>
<td>My main priority is completing my degree or certificate.</td>
<td>.196</td>
</tr>
<tr>
<td>I set aside time for homework when I need to.</td>
<td>.053</td>
</tr>
<tr>
<td>I complete all my class assignments on time.</td>
<td>.070</td>
</tr>
<tr>
<td>Career guidance is available to me at this college.</td>
<td>-.013</td>
</tr>
<tr>
<td>This college has a strong reputation in the community.</td>
<td>.152</td>
</tr>
<tr>
<td>I chose this college because the location is convenient.</td>
<td>.105</td>
</tr>
<tr>
<td>I chose this college because it is close to home.</td>
<td>-.102</td>
</tr>
</tbody>
</table>

**Trustworthiness**

For open-ended items on the CCMS, I consulted Creswell (2014), Glesne (2016), Krosnick and Presser (2010), and Saldaña (2016). I used open-ended questions for categorical questions (Krosnick & Presser, 2010) and to gather deeper data (Creswell, 2014; Glesne, 2016). I piloted the open-ended items with the same community college CTE students as with fixed response items. I used values coding (Saldaña, 2016) followed by theming the data (discussed more in detail in the next section). After piloting the survey, I checked the themes against my research questions and made slight revisions to language and syntax. The final version of the CCMS was approved by the Institutional Review Board and is included as Appendix A.
After administering the CCMS, I triangulated the open-ended responses with earnings data for the participant’s field of study and quantitative data gathered from fixed response item responses (Glesne, 2016). I discuss my findings in Chapter 4.

Data Analysis

I used bivariate analysis and cross-tabulation with elaboration for the fixed response (Likert-style) items, and I used coding and theming to analyze the open-ended responses (Glesne, 2016; Muijs, 2011; Saldaña, 2016). I used SPSS to analyze the quantitative data (Salkind, 2017) and manual coding for the qualitative data (Saldaña, 2016).

Quantitative Analysis

For quantitative analysis, I used bivariate analysis with Spearman’s rho and cross-tabulation with elaboration. My outcome variable was median wage level, and I had several predictor variables based on my research questions and literature review. I added two control variables for multivariate analysis using cross-tabulation. My outcome and predictor variables were ordinal, and my control variables were nominal with two categories (Healey, 2014). In this section I describe the variables and statistical tests used in my quantitative data analysis.

Outcome Variable. Item 2 of the CCMS asked participants to fill in their major or field of study. As shown in Table 8, students reported a total of 10 CTE fields of study. To represent field of study choice and allow for quantitative data analysis, I coded each field of study according to the high (H), medium (M), and
low (L) median wage levels. High wage fields of study, defined as exceeding the living wage for a family of two adults and one child, were given a value of 3. Low wage fields of study, defined as those with median earnings at or below 110 percent of the living wage level for one adult, were given a value of 1. Medium wage fields of study, defined as those with median earnings between the high and low levels, were given a value of 2. After coding each field of study according to these definitions, I used median wage level as the outcome (dependent) variable in quantitative analysis.

Table 8

**Participant Fields of Study**

<table>
<thead>
<tr>
<th>Field of Study</th>
<th>Median Quarterly Earnings</th>
<th>Median Wage Level</th>
<th>Number of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Female-dominated fields of study</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child Development</td>
<td>$6,000</td>
<td>Low (L)</td>
<td>3</td>
</tr>
<tr>
<td>Culinary</td>
<td>$6,036</td>
<td>L</td>
<td>9</td>
</tr>
<tr>
<td>Human Services</td>
<td>$6,108</td>
<td>L</td>
<td>21</td>
</tr>
<tr>
<td>Nursing</td>
<td>$15,345</td>
<td>High (H)</td>
<td>34</td>
</tr>
<tr>
<td><strong>Male-dominated fields of study</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administration of Justice</td>
<td>$13,610</td>
<td>H</td>
<td>36</td>
</tr>
<tr>
<td>Business</td>
<td>$7,628</td>
<td>Med (M)</td>
<td>7</td>
</tr>
<tr>
<td>Diesel / Automotive</td>
<td>$8,417</td>
<td>M</td>
<td>35</td>
</tr>
<tr>
<td>Geographic Information Systems</td>
<td>$12,780</td>
<td>H</td>
<td>1</td>
</tr>
<tr>
<td>Police Academy</td>
<td>$22,854</td>
<td>H</td>
<td>53</td>
</tr>
<tr>
<td>Water Supply Technology</td>
<td>$13,111</td>
<td>H</td>
<td>1</td>
</tr>
</tbody>
</table>

*Note:* Median quarterly earnings and gender breakdown is from LaunchBoard (2019)
As shown in Table 8, high wage fields of study included nursing, police academy, geographic information systems, and water supply technology; medium wage fields of study included diesel technology and business administration; and low wage fields of study included culinary, early childhood development, and human services. Median wages were obtained from LaunchBoard (2019).

Fields of study in Table 8 are divided into female-dominated and male-dominated; however, the number of participants in Table 8 includes both female and male students. Fields of study were designated by gender solely for purposes of explaining the disproportionate number of male participants (n=126) in the sample (N=200). The gender breakdown for each field of study was obtained from LaunchBoard (2019).

**Predictor Variables for Bivariate Analysis.** According to Muijs (2011), bivariate analysis is appropriate for non-experimental designs examining the relationship between an ordinal independent (predictor) variable and an ordinal dependent (outcome) variable. The CCMS included several predictor variables under the construct of student characteristics, as well as the career integration variable introduced by Hirschy et al. (2011). I converted these into composite variables, as explained below. The single outcome variable was choice of major in a high, medium, or low wage field of study.

To address my research questions and using Spearman’s rho, I created composite variables for survey items related to *earnings concerns, time*
concerns, and career integration. These variables corresponded to themes from qualitative responses and variables in the conceptual framework by Hirschy et al. (2011). Specifically, earnings and time concerns were included in the student characteristics construct, and career integration bridged support from the local community and the college (Hirschy et al., 2011). In addition, time concerns and career integration built upon literature about skills-builders (Bahr, 2016b; Booth, 2014), nontraditional students (Levin, 2007), and occupationally oriented students (Xu & Trimble, 2016). Table 9 shows the survey items that were included in each composite variable.

Table 9

Variables Included in Each Composite Variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>CCMS Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earnings concerns</td>
<td>3. My major will help me to earn a high salary.</td>
</tr>
<tr>
<td></td>
<td>4. I thought about earnings when I chose my major.</td>
</tr>
<tr>
<td></td>
<td>5. Earnings were the most important reason I chose my major.</td>
</tr>
<tr>
<td></td>
<td>6. I expect to earn more money after I finish my training.</td>
</tr>
<tr>
<td></td>
<td>7. I need to earn more money to support myself.</td>
</tr>
<tr>
<td></td>
<td>8. I need to earn more money to support my family.</td>
</tr>
<tr>
<td></td>
<td>9. I worry about money a lot.</td>
</tr>
<tr>
<td></td>
<td>10. In order to have the lifestyle I want, I need to earn a lot of money.</td>
</tr>
<tr>
<td></td>
<td>17. Before I enrolled, I knew how much I could earn in my field of study.</td>
</tr>
<tr>
<td></td>
<td>27. I know how much I can earn after I finish my training.</td>
</tr>
<tr>
<td>Time concerns</td>
<td>12. I need to finish my training as quickly as possible.</td>
</tr>
<tr>
<td></td>
<td>13. I want to finish my training as quickly as possible.</td>
</tr>
<tr>
<td></td>
<td>14. I chose my major so I could finish quickly.</td>
</tr>
</tbody>
</table>
15. I chose my major so I could get a job quickly in my field of study.
18. Time was the most important reason I chose my major.
19. My family needs me to get a job quickly.

<table>
<thead>
<tr>
<th>Career Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. My main priority is getting a job in my field of study.</td>
</tr>
<tr>
<td>20. I chose this major because of influence from my parents.</td>
</tr>
<tr>
<td>21. I chose this major because of influence from other relatives.</td>
</tr>
<tr>
<td>22. I chose this major because of influence from friends.</td>
</tr>
<tr>
<td>23. I took class(es) in high school related to this major.</td>
</tr>
<tr>
<td>24. I learned about this major in high school.</td>
</tr>
<tr>
<td>25. I chose this major because of influence from a high school teacher.</td>
</tr>
<tr>
<td>26. I chose this major because of influence from a high school counselor.</td>
</tr>
<tr>
<td>27. I chose this major because of influence from another high school employee.</td>
</tr>
<tr>
<td>28. I know how much I can earn after I finish my training.</td>
</tr>
<tr>
<td>29. My college has a clear pathway from my major to related jobs.</td>
</tr>
</tbody>
</table>

The three composite variables represented predictor (independent) variables for the outcome (dependent) variable, **median wage level**. Each predictor variable was based on Likert scale items and was considered ordinal. Because I examined the relationship between ordinal variables, I used Spearman’s rho to calculate correlation coefficients (Muijs, 2011).

The null and alternate hypotheses were as follows:

1. $H_0$: There is no significant relationship between earnings concerns and median wage level.

   $H_1$: There is a significant, positive correlation between earnings concerns and median wage level.
2. $H_0$: There is no significant relationship between time concerns and median wage level.
   
   $H_1$: There is a significant relationship between time concerns and median wage level.

3. $H_0$: There is no significant relationship between career integration and median wage level.
   
   $H_1$: There is a significant, positive correlation between career integration and median wage level.

**Predictor and Control Variables for Cross-tabulation.** Within the conceptual model of Hirschy et al. (2011) was the construct of student characteristics, which included sociodemographic variables such as gender, race, age, and ability to pay. In addition, literature on CTE students suggested that they were more likely than their non-CTE peers to be age 25 or older, students of color, and economically disadvantaged (Zhang & Oymak, 2018). To gain further insight into data from the fixed response items on the CCMS, I conducted bivariate analysis and elaboration using cross-tabulation (Healey, 2014). I looked for variables that did not have too many categories, were relevant to my research questions, and were included in the literature (Healey, 2014; Muijs, 2011).

For cross-tabulation with elaboration, I used median wage level as the outcome variable and tested two Likert items as the predictor variable: 5) Earnings were the most important reason I chose my major, and 4) I thought
about earnings when I chose my major. The first variable, *Earnings were the most important reason I chose my major*, failed to show statistical significance (p=.909). I then tested *I thought about earnings when I chose my major* and found statistical significance (p=.003). I used the variable *I thought about earnings when I chose my major* because it showed statistical significance at the 95% level. I discuss my findings in Chapter 4.

Finally, I selected age and annual income as control variables and collapsed them into two categories (Healey, 2014). I collapsed age into the categories of traditional (age 24 or under) and nontraditional (age 25 and older). I omitted participants who had skipped the age item and ran multivariate analysis using cross-tabulation with a sample of 196 students (n=196). Similarly, I collapsed annual income into below living wage ($24,999 or less) and living wage ($25,000 or more) and omitted participants who declined to answer the item. For annual income, I also omitted participants who had answered “I don’t know” for the income item in order to preserve the validity of the test (Healey, 2014). My resultant sample for the annual income control variable was 149 students (n=149). Results of multivariate analysis using cross-tabulation are given in Chapter 4. I did not use race as a control variable because it had several categories, which would decrease confidence in the results of elaboration (Healey, 2014).

**Qualitative Analysis**

For qualitative data, I began with verbatim responses from students and
used values coding (Saldaña, 2016) to code the responses. Saldaña (2016) defined values coding as “the application of codes to qualitative data that reflect a participant’s values, attitudes, and beliefs” (p. 131). Values coding was appropriate for this study because I was interested in the internal process that led students to select their CTE field of study. Their decision-making involved their values, attitudes, and beliefs. After coding the data with key words and short phrases, I looked for themes expressed in longer sentences (Glesne, 2016; Saldaña, 2016).

The open-ended CCMS items were the following:

37. In your experience, what factors were important in selecting your college major?

38. What is your plan after you finish your training at this college?

39. To what extent did you consider your future earnings when you chose your major?

40. If you could offer any recommendations to students selecting a major, what recommendations would you offer?

41. How would you describe the role of your community in your decision to study this major? Your community may include your family, friends, faith community, jobs center, or other groups you belong to.

42. Is there anything else you would like for us to know about how you selected your major?
Positionality of the Researcher

This study examined factors that influence field of study choice for community college CTE students. Drawing on Peshkin’s (1988) work on subjectivity and Tracy's (2010) description of self-reflexivity, I include here an examination of my positionality.

As discussed in the previous chapter, this study reflects the functionalist advocate view discussed by Dougherty (1994). As a community college employee and the product of working-class parents, I view community college and CTE as a viable means for gaining the skills necessary to earn a living wage. I have met and worked with students who moved from economic disadvantage to living wage via CTE, and I see CTE as a worthy topic (Tracy, 2010). CTE students fare better than students pursuing four-year degrees in terms of completion of a certificate, employment in their field of study, and short-term earnings after leaving college (Belfield & Bailey, 2011; Xu & Trimble, 2016). Whether students use CTE as a means of support while continuing to pursue higher academic degrees, or as a lifelong means of support, I see CTE as a positive option.

The population of students who take CTE is skewed to economically disadvantaged and persons of color (Ayers, 2005; Zhang & Oymak, 2018). Historically, CTE was viewed as a “lower” option for post-secondary students (Brint & Karabel, 1989; Cohen et al., 2014), and I acknowledge that institutionalized inequity still acts in ways that quash the academic preferences of
marginalized students. However, I disagree that CTE is a lower option, and I believe educators have an obligation to serve the students in front of them. The struggle for justice will outlast the years these individual students have to support their families. As a society, we should work for change. But encouraging all students to pursue non-CTE degrees while underplaying the possibilities of CTE in unjust. It removes a viable option from consideration for those students who are interested in CTE and would benefit from it.

I was curious about how CTE students chose their field of study. In this mixed-model design, I looked for rich descriptions of their experience (Glesne, 2016). My own bias about the importance of earnings came through in preliminary forming of the research questions, but peer consultation and additional review of the literature resulted in revised research questions. I continued to use these strategies as part of a self-reflexive practice throughout the study (Tracy, 2010).

As I collected and analyzed data, I used self-reflexivity (Tracy, 2010) and the strengths and weaknesses of subjectivity (Peshkin, 1988) as continued guides in my research.

Data Screening

Survey data were collected electronically via Google Forms and in person via paper surveys. The different survey modes were intended to maximize participation (Fan & Yan, 2010). Paper surveys were administered in person by
In total, 214 participants submitted the Choice of College Major Survey. Of these, six were removed because their major was outside Career Technical Education (CTE). These six responded to the invitation sent by the Institutional Research Office (IRO) during summer break. The IRO sent the invitation and link to students who had been enrolled in at least one CTE course during the previous semester; however, not all of these students had selected a CTE field of study as their primary focus.

In addition to removing responses from the six non-CTE students, one response was removed because it was a duplicate. This was evident from the submission time stamp, which was seconds apart, and the exact match of all responses, including short answer and open-ended, free response statements.

Seven responses to the CCMS were removed because they had missing values in the student characteristics domain. The final sample size was 200 (N=200), which is considered adequate for parametric statistics (Elliott & Woodward, 2007; Pallant, 2010; Salkind, 2017).

Summary

In this chapter, I described my methodology and research design. I employed a within-stage mixed-model design where quantitative data were collected via fixed response survey items and qualitative data were collected via open-ended survey items (Johnson & Onwuegbuzie, 2004). I introduced the
research problem, research questions, and purpose of the study. I tied my methodology and design to the conceptual framework of Hirschy et al. (2011) and provided the instrument I created for data collection. I described data collection and data analysis for quantitative and qualitative items. I present my findings in the next chapter.
CHAPTER FOUR

RESULTS

In this chapter, I report findings from administration of the Choice of College Major Survey (CCMS). I describe the study sample, discuss quantitative and qualitative data analysis, and relate the findings to my research questions and the conceptual framework of Hirschy et al. (2011).

Introduction

The purpose of this study was to examine factors influencing field of study choice for Career Technical Education (CTE) students at a community college. Because these students are more likely than four-year college students to be economically disadvantaged (Radford et al., 2016) and because earnings are a performance metric for community college CTE programs (CCCCO, 2018a), I was particularly interested in the importance of earnings in the CTE student’s decision to pursue a field of study. The three research questions that guided the study were:

1. What factors do students consider when they choose their CTE field of study at a community college?
2. Are earnings a significant and strong factor in CTE students' field of study choice?
3. What results emerge when comparing open-ended survey responses to results from quantitative analysis regarding factors influencing field of study choice for community college CTE students?
This mixed methods research employed a within-stage mixed-model design where quantitative data were collected via fixed response survey items and qualitative data were collected via open-ended survey items (Johnson & Onwuegbuzie, 2004). The Choice of College Major Survey (CCMS) was an original survey containing 27 fixed response items in the student characteristics domain, 7 items in the sociodemographic domain, 2 categorical items, and 6 open-ended items. Participants were community college students age 18 and older who were enrolled in CTE programs and voluntarily took the CCMS.

Sample Demographics

Although the CCMS used a short-answer question for the variable gender, all responses were either female or male. Of the 200 participants, 72 (36.0%) were females and 126 (63.0%) were males. Two participants skipped the gender item. The majority of participants identified as Hispanic / Latino (111 participants, or 55.5%), followed by White / Non-Hispanic (46 participants, or 23.0%) and Asian (19 participants, or 9.5%). One participant skipped the ethnicity item. Other demographic items included educational goal, age, employment status, financial situation, and household income. Table 10 summarizes demographics of the study sample.
Table 10

**Participant Demographics**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>72</td>
<td>36.0</td>
</tr>
<tr>
<td>Male</td>
<td>126</td>
<td>63.0</td>
</tr>
<tr>
<td><strong>Immediate Educational Goal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Certificate</td>
<td>76</td>
<td>38.0</td>
</tr>
<tr>
<td>Associate’s Degree</td>
<td>93</td>
<td>46.5</td>
</tr>
<tr>
<td>Classes only. No degree.</td>
<td>11</td>
<td>5.5</td>
</tr>
<tr>
<td>Other</td>
<td>14</td>
<td>7.0</td>
</tr>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American / Black</td>
<td>6</td>
<td>3.0</td>
</tr>
<tr>
<td>American Indian / Native American</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>Asian</td>
<td>19</td>
<td>9.5</td>
</tr>
<tr>
<td>Hispanic / Latino</td>
<td>111</td>
<td>55.5</td>
</tr>
<tr>
<td>Pacific Islander</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>White / Non-Hispanic</td>
<td>46</td>
<td>23.0</td>
</tr>
<tr>
<td>Other / More than one ethnicity</td>
<td>12</td>
<td>6.0</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under 20</td>
<td>20</td>
<td>10.0</td>
</tr>
<tr>
<td>20-24</td>
<td>71</td>
<td>35.5</td>
</tr>
<tr>
<td>25-29</td>
<td>54</td>
<td>27.0</td>
</tr>
<tr>
<td>30-34</td>
<td>26</td>
<td>13.0</td>
</tr>
<tr>
<td>35-39</td>
<td>15</td>
<td>7.5</td>
</tr>
<tr>
<td>40-49</td>
<td>6</td>
<td>3.0</td>
</tr>
<tr>
<td>50-59</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>60+</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Current Employment Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed 35 or more hours per week</td>
<td>112</td>
<td>56.0</td>
</tr>
<tr>
<td>Employed 16-34 hours per week</td>
<td>26</td>
<td>13.0</td>
</tr>
<tr>
<td>Employed 1-15 hours per week</td>
<td>15</td>
<td>7.5</td>
</tr>
<tr>
<td>Not working, currently looking</td>
<td>26</td>
<td>13.0</td>
</tr>
<tr>
<td>Not working, not currently looking</td>
<td>19</td>
<td>9.5</td>
</tr>
<tr>
<td><strong>Financial Situation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parents are supporting me</td>
<td>43</td>
<td>21.5</td>
</tr>
</tbody>
</table>
The demographics of the sample somewhat reflected national community college and CTE demographics reported by Radford et al. (2016) and Zhang and Oymak (2018), as well as population demographics in San Bernardino County ("U.S. Census Bureau QuickFacts," n.d.). For example, the majority of participants identified as Hispanic / Latino (55.5%), followed by White (23.0%). This is similar to San Bernardino County ethnic makeup of Hispanic / Latino (53.4%), followed by White (28.6%; "U.S. Census Bureau QuickFacts," n.d.). The next largest group differed between the sample and San Bernardino County data, with Asian (19 participants, or 9.5%) being the third-largest group in the sample and the fourth largest group in San Bernardino County (7.6%). African American / Black (6 participants, or 7.6%) was fourth-largest in the sample and third-largest in San Bernardino County (9.4%) ("U.S. Census Bureau QuickFacts," n.d.). The
raw numbers associated with these percentages were small; therefore, this discrepancy might have corrected itself had the sample size been larger.

Gender demographics in the sample were different from national data (Radford et al., 2016; Zhang & Oymak, 2018) and were affected by the fields of study represented. Kugler et al. (2017) operationalized the term *signals of fit* (p. 23) to describe cues such as gender of classmates and faculty, course grades, and high school preparation that affected students’ choice of major. My findings reflected gender differences in female-dominated and male-dominated fields of study. Nursing (n=34) and human services (n=21) are female-dominated fields of study, and police academy (n=53), administration of justice (n=36), and diesel technology (n=35) are male-dominated fields (LaunchBoard, 2019). The majority of participants in this study came from male-dominated fields. The number of males (n=126) in the sample was much larger than the number of females (n=72).

In addition to gender, the high proportion of students in police academy (n=53) and administration of justice (n=36) skewed demographic data such as age, current employment status, and household income. According to the Dean of the program, the target college offers its police academy program to local police and sheriff’s departments, and most of the students are newly-hired officers and deputies (Dean of administration of justice and police academy programs, personal communication, September 28, 2019). In examining CCMS responses in the sociodemographic domain, 49 police academy participants
reported full-time employment, and four responded that they were not currently employed but were looking for work. Forty-six of the 53 police academy participants reported their age as 29 or younger. The demographics of this group helps to explain the disproportionate percentage of students in the sample who reported full-time employment, income above $44,999, and age between 20 and 29.

Findings

Earnings Concerns

Earnings concerns was the first predictor variable used in bivariate analysis. As discussed in the previous chapter, earnings concerns was a composite variable that included CCMS items asking about earnings.

To address my research question regarding the significance and strength of earnings in field of study choice, I ran a one-tailed Spearman's rho to determine the relationship between median wage level and earnings concerns. Table 11 shows the results. There was a weak to modest positive correlation between median wage level and earnings concerns, which was found to be statistically significant ($r=.243$, $n=200$, $p<.001$). Because the relationship between the two variables was found to be statistically significant ($p<.001$), I rejected the first null hypothesis:

$H_0$: There is no significant relationship between earnings concerns and median wage level.
Table 11

**Correlation between Earnings Concerns and Median Wage Level**

<table>
<thead>
<tr>
<th>Spearman’s rho</th>
<th>Median Wage Level</th>
<th>Correlation Coefficient</th>
<th>Sig. (1-tailed)</th>
<th>Earnings Concerns Correlation Coefficient</th>
<th>Sig. (1-tailed)</th>
<th>N (1-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median Wage Level</td>
<td>1.000</td>
<td>.243***</td>
<td>.000</td>
<td>1.000</td>
<td>.000</td>
<td>200</td>
</tr>
<tr>
<td>Earnings Concerns</td>
<td></td>
<td>.243***</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

***. Correlation is significant at the 0.001 level (1-tailed).

**Time Concerns**

Time concerns was the second predictor variable used in bivariate analysis. As discussed in the previous chapter, *time concerns* was a composite variable that included CCMS items asking about students’ interest in finishing their training quickly.

To address my first research question regarding the factors students consider in their field of study choice, and to build upon previous literature (Bahr, 2016b; Booth, 2014; Levin, 2007; Xu & Trimble, 2016), I tested *time concerns* as a predictor for CTE field of study choice. Because I had no a priori hypotheses about the direction of the relationship between *time concerns* and *median wage level*, I ran a two-tailed Spearman’s rho for this independent variable. Table 12
shows the results. There was no significant relationship between median wage level and time concerns \((p=0.853)\). I failed to reject the second null hypothesis:

\[ H_0: \text{There is no significant relationship between time concerns and median wage level.} \]

Table 12

Relationship between Time Concerns and Median Wage Level

<table>
<thead>
<tr>
<th>Spearman’s rho</th>
<th>Median Wage Level</th>
<th>Correlation Coefficient</th>
<th>Median Wage Level</th>
<th>Time Concern</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sig. (2-tailed)</td>
<td>1.000</td>
<td>.0133</td>
</tr>
<tr>
<td>Time Concern</td>
<td></td>
<td>N</td>
<td>200</td>
<td>200</td>
</tr>
</tbody>
</table>

Correlation is not statistically significant \((p=0.853)\).

Career Integration

According to the conceptual model of Hirschy et al. (2011), career integration includes variables such as exposure to the field of study, familiarity with the career through the community or school environment, and a clear pathway through college to the career. Hirschy et al. (2011) posited a positive correlation between career integration and completion of a degree or certificate. I
hypothesized that *career integration* would be positively correlated with CTE field of study choice.

I ran a one-tailed Spearman’s rho to determine the relationship between *career integration* and *median wage level*. Table 13 shows the results. There was a weak to modest positive relationship between *career integration* and *median wage level*, which was found to be statistically significant ($r=.159$, $n=200$, $p=.012$). Because the relationship was statistically significant at the 95% level ($p<.05$), I rejected the third null hypothesis:

$$H_0: \text{There is no significant relationship between career integration and median wage level.}$$

<table>
<thead>
<tr>
<th>Spearman’s rho</th>
<th>Median Wage Level Correlation Coefficient</th>
<th>Median Wage Level Sig. (1-tailed)</th>
<th>Career Integration Correlation Coefficient</th>
<th>Career Integration Sig. (1-tailed)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1.000</td>
<td>.159*</td>
<td>.012</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td>Median Wage Level</td>
<td></td>
<td></td>
<td>N</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>200</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Career Integration</td>
<td>.159*</td>
<td></td>
<td>.012</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N</td>
<td></td>
</tr>
</tbody>
</table>

*. Correlation is significant at the 0.05 level (1-tailed).
These results suggest that earnings concerns and career integration are related to field of study choice for CTE students, but time to completion is not a significant factor.

After conducting bivariate analyses with Spearman’s rho, I conducted multivariate analysis using cross-tabulation with elaboration. As discussed in Chapter 3, my predictor variable for cross-tabulation was *I thought about earnings when I chose my major*, and my outcome variable was *median wage level*. After finding a statistically significant, positive correlation between the predictor and outcome variables (p=.003), I controlled for *age* and *current annual income*. I discuss my findings below from bivariate and multivariate analysis using cross-tabulation.

**Thinking about Earnings and Median Wage Level**

To test for significance and strength of the predictor and outcome variables, I ran bivariate analysis using cross-tabulation for *I thought about earnings when I chose my major* and *median wage level*. I found a weak to moderate, positive relationship between the variables that was statistically significant (gamma=.279, p=.003). Table 14 shows the results. In the contingency table (Table 14), the percentage of participants who strongly disagreed with *I thought about earnings when I chose my major* was higher for low wage fields of study (35.3 percent) than for medium (23.5 percent) or high wage fields of study (10.7 percent). On the other side of the Likert scale, the results were reversed. More participants in high wage fields of study (74.6
percent) strongly agreed with *I thought about earnings when I chose my major*, and only 5.1 percent participants in low wage fields of study strongly agreed with the statement. These results suggest that participants in medium and high wage fields were more likely to think about earnings when they selected their field of study than were participants in low wage fields.

Table 14

**Thinking about Earnings by Median Wage Level**

<table>
<thead>
<tr>
<th>Median Wage Level</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>6 (35.3%)</td>
<td>7 (43.8%)</td>
<td>10 (22.2%)</td>
<td>7 (11.1%)</td>
<td>3 (5.1%)</td>
<td>33</td>
</tr>
<tr>
<td>Medium</td>
<td>4 (23.5%)</td>
<td>1 (6.3%)</td>
<td>4 (8.9%)</td>
<td>20 (31.7%)</td>
<td>12 (20.3%)</td>
<td>41</td>
</tr>
<tr>
<td>High</td>
<td>7 (10.7%)</td>
<td>8 (50.0%)</td>
<td>31 (68.9%)</td>
<td>36 (57.1%)</td>
<td>44 (74.6%)</td>
<td>126</td>
</tr>
<tr>
<td>Total</td>
<td>17 (100%)</td>
<td>16 (100%)</td>
<td>45 (100%)</td>
<td>63 (100%)</td>
<td>59 (100%)</td>
<td>200</td>
</tr>
</tbody>
</table>

Gamma = .279    p=.003**

**. Relationship is significant at the 0.01 level.

After finding statistical significance (p=.003) in bivariate analysis using cross-tabulation, I controlled for age and annual income and ran multivariate analysis for each of these control variables. I describe the results below.
**Controlling for Age.** I controlled for age and found a moderately strong, positive relationship between the variables that was statistically significant (gamma=.467, p<.001) for nontraditional students, and no statistical significance for traditional students (p=.112). Table 15 shows the results. These results indicate that nontraditional students, operationalized as age 25 or older, were more likely to think about earnings when they selected their field of study than were traditional students, operationalized as age 24 or younger. The relationship between *I thought about earnings when I chose my major* and median wage level was interactive because it was stronger for older (nontraditional) students than for the sample as a whole (N=200), and the relationship disappeared for younger (traditional) students.

Table 15

**Thinking about Earnings by Median Wage Level, Controlling for Age**

**A. Age 24 and younger**

<table>
<thead>
<tr>
<th>Median Wage Level</th>
<th>I thought about earnings when I chose my major.</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strongly Disagree</td>
<td>Disagree</td>
<td>Neutral</td>
<td>Agree</td>
<td>Strongly Agree</td>
<td>Total</td>
</tr>
<tr>
<td>Low</td>
<td>1 (12.5%)</td>
<td>1 (20.0%)</td>
<td>5 (20.8%)</td>
<td>4 (12.5%)</td>
<td>2 (9.1%)</td>
<td>13 (14.3%)</td>
</tr>
<tr>
<td>Medium</td>
<td>4 (50.0%)</td>
<td>0 (0.0%)</td>
<td>2 (8.3%)</td>
<td>12 (37.5%)</td>
<td>5 (22.7%)</td>
<td>23 (25.3%)</td>
</tr>
<tr>
<td>High</td>
<td>3 (37.5%)</td>
<td>4 (80.0%)</td>
<td>17 (70.8%)</td>
<td>16 (50.0%)</td>
<td>15 (68.2%)</td>
<td>55 (60.4%)</td>
</tr>
<tr>
<td>Total</td>
<td>8 (100%)</td>
<td>5 (100%)</td>
<td>24 (100%)</td>
<td>32 (100%)</td>
<td>22 (100%)</td>
<td>91 (100%)</td>
</tr>
</tbody>
</table>

Gamma = .139  p=.652

Relationship is not statistically significant (p=.652).
As shown in Table 15, there was a large change in the strength of the relationship when controlling for age. Before controlling for age, there was a weak to moderate relationship \((\text{gamma}=0.279)\) between the variables. However after controlling for age, participants age 25 and older showed a moderate to strong relationship \((\text{gamma}=0.467)\), and participants age 24 and under showed no statistically significant relationship \((p=0.652)\). This suggests that students think about earnings more as they age. This finding is especially relevant for CTE students, who tend to be older than non-CTE students (Zhang & Oymak, 2018). I will discuss the implications more in the next chapter.

Controlling for Annual Income, I controlled for annual income and found a moderately strong association between *I thought about earnings when I chose my major* and median wage level for participants whose annual earnings were at

<table>
<thead>
<tr>
<th>Median Wage Level</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>5 (55.6%)</td>
<td>6 (54.5%)</td>
<td>5 (25.0%)</td>
<td>3 (10.3%)</td>
<td>1 (2.8%)</td>
<td>20 (19.0%)</td>
</tr>
<tr>
<td>Medium</td>
<td>0 (0.0%)</td>
<td>1 (9.1%)</td>
<td>2 (10.0%)</td>
<td>6 (20.7%)</td>
<td>6 (16.7%)</td>
<td>15 (14.3%)</td>
</tr>
<tr>
<td>High</td>
<td>4 (44.4%)</td>
<td>13 (36.4%)</td>
<td>20 (65.0%)</td>
<td>29 (69.0%)</td>
<td>29 (80.6%)</td>
<td>70 (66.7%)</td>
</tr>
<tr>
<td>Total</td>
<td>9 (100%)</td>
<td>11 (100%)</td>
<td>20 (100%)</td>
<td>29 (100%)</td>
<td>36 (100%)</td>
<td>105 (100%)</td>
</tr>
</tbody>
</table>

\[
\text{Gamma} = .467 \quad p<.001^{***}
\]

***. Relationship is significant at the 0.001 level.
or above living wage (gamma=.493, p<.001) and no relationship between the
variables for participants whose annual earnings were below living wage
(p=.698). Table 16 shows the results. These findings suggest that participants
whose current annual earnings were at or above living wage had thought about
earnings when they selected their CTE field of study.

Delving deeper into the results, the contingency table showed that of the
149 participants (n=149) who responded to the income item, 38 had annual
income below living wage and 111 had annual income at or above living wage.
Of the 38 below living wage, 20 had selected a high wage field of study, and only
6 had selected a low wage field of study. However, more participants in the lower
income group strongly disagreed or disagreed that they thought about earnings
when they chose their major than did participants in the higher income group. Of
the 111 participants with annual income at or above living wage, the majority (81)
selected a high wage field of study, and more than half agreed or strongly agreed
that they had thought about earnings when they made their decision. In sum, my
findings indicated that although students across income levels chose high
median wage fields of study more than low or medium wage fields of study,
participants who currently had annual income at or above living wage were more
likely to consider earnings when they made their decision.
Table 16

Thinking about Earnings by Median Wage Level, Controlling for Annual Income

A. Below Living Wage

<table>
<thead>
<tr>
<th>Median Wage Level</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>1 (33.3%)</td>
<td>0 (0.0%)</td>
<td>4 (40.0%)</td>
<td>0 (0.0%)</td>
<td>1 (6.7%)</td>
<td>6 (15.8%)</td>
</tr>
<tr>
<td>Medium</td>
<td>0 (0.0%)</td>
<td>1 (10.0%)</td>
<td>5 (55.6%)</td>
<td>6 (40.0%)</td>
<td>12 (31.6%)</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>2 (66.7%)</td>
<td>1 (100%)</td>
<td>5 (50.0%)</td>
<td>4 (44.4%)</td>
<td>8 (20.0%)</td>
<td>20 (52.6%)</td>
</tr>
<tr>
<td>Total</td>
<td>3 (100%)</td>
<td>1 (100%)</td>
<td>10 (100%)</td>
<td>9 (100%)</td>
<td>15 (100%)</td>
<td>38 (100%)</td>
</tr>
</tbody>
</table>

Gamma = .091
p = .698

Relationship is not statistically significant (p = .698).

B. At or Above Living Wage

<table>
<thead>
<tr>
<th>Median Wage Level</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>5 (50.0%)</td>
<td>4 (16.0%)</td>
<td>3 (10.0%)</td>
<td>2 (6.1%)</td>
<td>19 (17.1%)</td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>2 (20.0%)</td>
<td>2 (8.0%)</td>
<td>4 (13.3%)</td>
<td>2 (6.1%)</td>
<td>11 (9.9%)</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>3 (30.0%)</td>
<td>7 (38.5%)</td>
<td>19 (76.7%)</td>
<td>23 (87.9%)</td>
<td>81 (73.0%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>10 (100%)</td>
<td>13 (100%)</td>
<td>25 (100%)</td>
<td>30 (100%)</td>
<td>33 (100%)</td>
<td>111 (100%)</td>
</tr>
</tbody>
</table>

Gamma = .493
p < .001***

***. Relationship is significant at the 0.001 level.

In sum, the results of bivariate analysis using Spearman’s rho and multivariate analysis using cross-tabulation indicated that earnings concerns were more important to participants who had selected medium and high wage
fields of study, were older than traditional aged students, and currently had annual income at or above living wage. In addition, participants who had experiences within the career integration category of Hirschy et al. (2011) were more likely to select a high or medium wage field. The implications of these findings will be discussed further in Chapter 5.

Student Characteristics Construct

Hirschy et al. (2011) included six variables within the *student characteristics* construct: a) sociodemographic, b) academic preparation, c) commitments and responsibilities, d) dispositions and skills, e) educational intentions and goals, and f) employment intentions and goals. While most CCMS fixed response items connected with these variables (e.g., earnings as part of employment intentions and goals), the motivation behind these connections was not captured quantitatively. For example, students who responded with *agree* or *strongly agree* to the fixed response item “I thought about earnings when I chose my major” may have responded that way because of family commitments, which is under commitments and responsibilities in the conceptual model (Hirschy et al., 2011). Additionally, values, attitudes, and beliefs such as passion and interest became apparent in qualitative responses and contributed to greater understanding. In the next sections I incorporate data from qualitative analysis.

Incorporating Data from Qualitative Analysis

Quantitative data analysis addressed my first two research questions, but not the third: “What results emerge when comparing open-ended survey
responses to results from quantitative analysis regarding factors influencing field of study choice for community college CTE students?"

The third research question was addressed by coding qualitative data, organizing categories into themes, and comparing the themes to quantitative results. Qualitative data also added to understanding of the first research question by providing greater insight into factors related to field of study choice. I now turn to discussion of the qualitative data gathered from open-ended CCMS items.

Qualitative Analysis

Qualitative analysis affirmed and deepened quantitative results. The following four themes emerged: (a) Earnings are important in field of study choice; (b) Career interest is the most important factor in field of study choice; (c) Connection to family; and (d) Time is the price of entering the desired career.

The four themes reflected values of the participants such as earnings, career interest, family, and reaching the end goal, as well as participants’ belief that each person should select based on their own priorities. Additionally, the first two themes spoke most strongly to factors considered by students in making their field of study choice, and the remaining two themes informed the factors under consideration. In this section I discuss each theme and sub-theme.

Theme 1: Earnings are Important in Field of Study Choice

The first theme was *Earnings are important in field of study choice*. Similar to quantitative results, participants who selected medium and high wage fields of
study appeared to prioritize earnings more than participants who selected low wage fields of study. This was not surprising, as bivariate analysis of quantitative data revealed a weak to modest, statistically significant ($p<.05$) positive correlation between earnings concerns and median wage level. Multivariate analysis revealed that students were more likely to indicate that they considered earnings if their current annual income was at or above living wage. For this theme, qualitative results were consistent with quantitative.

High and Medium Wage Fields of Study. Students in high (H) and medium (M) wage fields of study cited factors such as earnings, pay, benefits, salary, and money as top reasons for selecting their field of study. Students in high and medium wage fields also cited employment factors such as job security, high demand for new employees, and job stability as important in their decision. For example, in response to item 39, “To what extent did you consider your future earnings when you chose your major,” a participant from nursing (H) replied, “It is the main reason I chose this major.” This participant had put thought into earnings and encouraged others to do the same, as evidenced by her subsequent comment that new students should “realistically consider financial status” when selecting a major. Earnings appeared to play a central role in her decision-making. A participant from the police academy (H) expanded on earnings to include benefits and career advancement: “The job would provide good pay and benefits, along with room for promotion.” This participant connected high earnings to other benefits, expressing the desire for a lifestyle
that started with a high wage field of study, followed by a stable career with career advancement, and eventually a secure retirement.

Low Wage Fields of Study. In contrast to high and medium wage fields of study, participants from low wage fields (L) did not express earnings as a priority in their field of study choice. In their replies to item 39, “To what extent did you consider your future earnings when you chose your major,” participants in low (L) wage fields of study seemed to have thought about earnings and decided not to prioritize them. For example, a participant in child development (L) replied, “I understand how much I would be earning.” This participant reported passion for the career as her main priority and seemed to resist prioritizing earnings. There were similar responses from participants across fields of study and all wage levels who felt passion was more important than earnings. I will discuss this further under the career interest theme.

Lack of knowledge did not seem to be the reason participants selected a low wage field of study. Among participants in low wage fields of study, none reported being unaware of the earnings, and only one responded “I don’t know” to item 39, “To what extent did you consider your future earnings when you chose your major.” This response came from a participant in human services (L) who reported “helping others” as the most important factor in field of study choice. Again, similar responses came from all wage levels. Thus across all wage levels, passion for the career and values associated with the career, such as helping others, were more important in field of study choice than earnings.
The difference was that while participants in medium and high wage fields also prioritized earnings, no participant in low wage fields of study reported earnings as a priority. This is consistent with quantitative findings of a positive correlation between earnings concerns and field of study choice. In both quantitative and qualitative findings, students in high and medium wage fields of study reported considering earnings when they selected their field of study, and students in low wage fields of study reported not considering earnings.

**Theme 2: Career Interest is Most Important in Field of Study Choice**

The second theme was *career interest is the most important factor in field of study choice*. This theme was common across all median wage levels and had three sub-themes: (a) The career fits my plan, (b) enjoy the work, and (c) passionate about my future career. The three sub-themes worked along a continuum representing a confluence of values, attitudes, and beliefs. Each sub-theme will be discussed in this section.

**Sub-theme A: The Career Fits My Plan.** The first sub-theme, *the career fits my plan*, involved career interest without much emotion. Some students were pragmatic, having a straightforward plan for getting through school and moving on to a career, earnings, advancement, and eventual retirement. For example, a participant in diesel (M) planned to “try and get a job at the railroad.” This participant explained that the railroad was close to home and would offer an acceptable wage. The plan checked off some boxes of interest to the participant, and the work was acceptable. The work itself was not the point, however.
Instead, the student was using the work to stay close to home. A second diesel student was interested in starting a trucking company and reported, “I plan to get tax certified, obtain my bachelor’s degree and become audit certified.” The student was taking diesel to become familiar with the field, and their plan included these specific steps toward the goal of becoming a business owner.

Students whose responses fit this sub-theme valued stability, were interested in their future career, and had done research on job demand prior to making their field of study choice. Another example came from a participant in business (M), who responded to the earnings question with her plan: “When I made the decision to return to school the degree would have made a 25% difference in pay. Because of going to school I have already promoted and finishing my degree will now make a 10-15% pay increase from when I started.” This response is quite positive about the intent and impact of college, and it reveals a clear plan. However, it does not say the field of study was especially interesting or enjoyable to the participant, nor does it express the passion at the other end of the continuum. The participant expressed interest in earnings, and her response could be placed under that theme as well. However, the details in her response indicated an interest in having and carrying out a plan.

**Sub-theme B: Enjoy the Work.** In the middle of the continuum were students who fit the theme, *enjoy the work.* This sub-theme captured responses that showed interest in the career without rising to the level of passion, as in the next sub-theme. Students listed factors such as “something I would enjoy doing”
(administration of justice - H) and “I like science” (nursing - H) as important factors in their field of study choice. The enjoy the work sub-theme was a common response across all median wage levels, but it was most common among participants in the medium wage fields of study. One participant went from one medium wage field (business) to another (diesel) and attributed the switch to this theme: “I was a business major before this course. I did not want to be stuck in the business setting. I am a hands on person and enjoy working with my hands.” This student prioritized enjoyment of the work so much that it led him to change his field of study.

Sub-theme C: Passionate about My Future Career. Stronger responses came from students whose values more closely fit the sub-theme, passionate about my future career. Values, attitudes, and beliefs under this sub-theme involved emotion and often brought up childhood goals or long-term dreams. For example, a student from police academy (H) said his main priority was “to become a police officer,” and he recommended that new students “pick something you want to do the rest of your life.” His field of study choice was never in question – he was pursuing his dream career. This type of response came from students across fields of study and median wage levels. Participants recommended that new students “do what you really want” (administration of justice - H), “go for a major you really see yourself working forever” (human services - L), and “do something you love, so it doesn’t feel like you’re working” (culinary - L). Each of these responses shows passion for the future career that
was more important to the participants than earnings when they made their field of study choice. As stated previously, the difference was that students in high and medium wage fields of study said earnings were also important, whereas students in low wage fields of study seem to have made the difficult decision to choose passion over earnings.

Theme 3: Connection to Family

A common value from open-ended survey responses was connection to family. Connection was expressed in terms of providing for family as well as receiving support and guidance from family. Returning to my research questions, the importance of earnings emerged in open-ended responses as a means to the desired end. Earnings were seen as a way to support family, spend quality time with family, and give back to members of the previous generation. For example, a diesel (M) student said the most important factor in his field of study choice was “supporting my family, being a support they can lean on.” This response showed a desire to help the family, which was the true motivation for selecting his field of study.

Family became its own factor in CTE field of study choice. In describing the role of family in field of study choice, students cited the desire to continue the family business, follow family members who already worked in the field, help parents who struggled with low income or lived in crime-ridden neighborhoods, or make parents proud. This occurred across all median wage levels. A typical example came from a nursing student who responded, “My family played a big
role because my parents wanted me to have a good paying job and also a lot of
my family is in the medical field so it was normal.” This response reflected the
influence of family as role models and supporters. In this response, the family
encouraged the student to consider earnings in field of study choice.

Family and community were sometimes reported together in qualitative
responses. In response to item 41, “How would you describe the role of your
community in your decision to study this major,” two students from diesel (M)
looked at it from opposite points of view. The first student saw community and
family as support: “I learned about this program from a member of my church.
Also my family was a big influence.” The second student saw family as support,
and the community as an entity in need of his support: “My family strongly
supports me in the major I’m choosing. There are also many shops that need
mechanics in my city.” In each of these examples, family and community
combine to support the student in his choice and to receive support from the
student when he enters the related career.

Theme 4: Time is the Price to Enter the Desired Career

Time to completion was less prominent in open-ended responses than
were other themes such as the desire to earn high wages and interest in the
career. However, time concerns emerged under two sub-themes: (a) time is the
price of entering the desired career, and (b) get through quickly vs. take your
time.
Sub-theme A: Time is the Price of Entering the Desired Career. In coding the first sub-theme, *time is the price of entering the desired career*, I regarded *time is the price* as an attitude and *entering the desired career* as a value. Put together, time became a means to the desired end. An example of a participant who saw time as the price of entering his field of study was a diesel (M) student who said, “I wanted to get done with college fast and start my future.” This student had his eyes on the end goal. Similarly, a culinary (L) student listed “passion for major and speed at which it is done by” as their primary reason for selecting their field of study. The student was interested in a culinary career and was attracted to the field of study because it was a fairly short program.

Interestingly, the most explicit response under this sub-theme came from a nursing (H) student, whose program was longer than most CTE fields of study. For her response to the factors important in her field of study choice, she wrote “the ability to jump into the career field soon.” Such responses show students’ eagerness to enter their field of study. Time was seen as a necessary gateway to their true passion, the future career.

Sub-theme B: Get Through Quickly versus Take Your Time. The second sub-theme, *get through quickly vs. take your time*, encompassed opposite beliefs by different participants. The beliefs became especially clear from participants’ recommendations to new students selecting a major. Several students recommended taking time to explore different majors through research and experience, and a few believed new students should select a major quickly.
Table 17 gives examples of responses under this theme, followed by explanation and further analysis.

### Table 17

**Responses for Get Through Quickly versus Take Your Time**

<table>
<thead>
<tr>
<th>Participant’s field of study</th>
<th>Participant’s recommendation</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culinary (L)</td>
<td><em>Get through quickly</em></td>
<td>These responses emphasized the importance of quickly progressing toward the educational goal.</td>
</tr>
<tr>
<td>Diesel (M)</td>
<td>Pick a major and don’t wait years later.</td>
<td></td>
</tr>
<tr>
<td>Diesel (M)</td>
<td>I would say to not waste time and get through classes quickly.</td>
<td></td>
</tr>
<tr>
<td>Nursing (H)</td>
<td><em>Take your time</em></td>
<td>Participants were less rushed and recommended career exploration, even if it took longer.</td>
</tr>
<tr>
<td>Police Academy (H)</td>
<td>Go work some jobs first to see what interests you. Lots of people choose majors and end up not liking them.</td>
<td></td>
</tr>
<tr>
<td>Police Academy (H)</td>
<td>A guidance class that explores different careers, YouTube videos about different careers.</td>
<td></td>
</tr>
<tr>
<td>Police Academy (H)</td>
<td>I would recommend taking their time and not rushing into anything. If possible, try to gain experience in that field.</td>
<td></td>
</tr>
</tbody>
</table>
In Table 17, responses under *get through quickly* indicate a hurried attitude within the participant. The CCMS did not include an item asking how long the student had been at the college, but these students could have been among the 66 percent of community college students who have not completed a degree or certificate within six years of initial enrollment (Radford et al., 2010). Or, they could be eager to join the workforce because of career interest or financial need. The CCMS did not capture all facets of motivation behind the open-ended responses, and this will be addressed in the next chapter as a limitation of the study and a recommendation for further study. Similarly, responses under *take your time* revealed less concern for time and more concern for making an informed decision. Consistent with the theme, time was the price of entering into the desired career, and these participants believed part of the time was well spent on making an informed choice.

Although the responses in Table 17 show high wage fields of study under the *take your time* belief and low and medium wage fields of study under the *get through quickly* belief, it would be premature to conclude that students in higher wage fields of study favor a more deliberate decision-making process. Quantitative analysis failed to show significant correlation for time concerns, and the literature is silent on the importance of time in field of study choice for community college CTE students. Because the majority of CTE students are nontraditional (Levin, 2007; Zhang & Oymak, 2018), they might have greater time
concerns than traditional students. However, further study is warranted and will be discussed in Chapter 5.

Quantitative and Qualitative Findings

Taken together, my quantitative and qualitative findings supported earnings, career integration, and career interest or passion as important factors in CTE student field of study choice. Students were also influenced by family and by pragmatic concerns such as whether or not the future career fit within the student’s plan.

The influence of family was prevalent in qualitative responses but did not show statistical significance in quantitative analysis. Family was not a focus of this study and was not measured by fixed response items, although it was included in the student characteristics construct and the career integration variable of the conceptual framework used in the study (Hirschy et al., 2011). The high percentage of participants who identified as Hispanic / Latino could have been related to the emergence of family connection as a theme in qualitative responses (Acevedo-Gil, 2017; Farrington, 2018). Further research would add to theory and practice and will be discussed in the next chapter.

Research Questions

The results of the Choice of College Major Survey (CCMS) addressed my three research questions in the following ways.
Question 1. What Factors Do Students Consider When They Choose Their Career Technical Education Field of Study at a Community College?

Student responses for earnings and career integration indicated a weak to modest positive relationship between these variables and selection of a high, medium, or low wage field of study. Thus it appears that these considerations are related to field of study choice. In addition, students listed factors relating to these variables in open-ended survey item responses.

Factors were different for older students and those whose annual income was at or above living wage than for younger students and those with less annual income. Cross-tabulation with elaboration revealed that students age 25 and older had thought about earnings more than students age 24 and under, and that students whose current income was at or above living wage had thought about earnings more than students whose income was less than living wage.

Question 2. Are Earnings a Significant and Strong Factor in Career Technical Education Students’ Field of Study Choice?

As noted above, earnings concerns showed a weak to modest positive relationship with choice of major in a high, medium, or low field of study. The relationship was statistically significant at the .001 level (p<.001). When controlling for age and current income, the relationship between earnings and field of study choice was stronger for students age 25 and older (gamma=.467, p<.001) and for students who reported current annual income at or above the regional living wage (gamma=.493, p<.001). Qualitative results were consistent
with quantitative; open-ended responses revealed earnings as a priority for students in high and medium wage fields of study. Students in low wage fields of study either left earnings out of their open-ended responses, or responded that they were aware and had decided based on passion for the career or another value, such as helping others.

**Question 3. What Results Emerge When Comparing Open-ended Survey Responses to Results from Quantitative Analysis Regarding Factors Influencing Field of Study Choice for Community College Career Technical Education Students?**

Open-ended survey responses confirmed and deepened results from quantitative analysis. Responses to open-ended items clarified quantitative variables such as earnings concerns, time concerns, and career integration, and expanded to themes around career interest, passion, and family. An emergent theme was the importance of family in field of study choice. This theme was not tested quantitatively, and the CCMS only had a few fixed response items for family.

**Summary**

In this chapter I reported my findings through quantitative and qualitative analysis. My research questions were addressed through quantitative and qualitative analysis. In the next chapter, I interpret my findings and discuss the implications for policy and future research.
The conceptual model by Hirschy et al. (2011) provided a useful framework for this study. My findings were specific to CTE decision-making that had mostly occurred prior to enrollment. Because my research purpose and questions were different from those of Hirschy et al. (2011), my findings led to a proposed conceptual model that will be discussed in the next chapter.
CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

Introduction

The purpose of this study was to examine factors influencing field of study choice for community college CTE students. I focused on earnings because CTE students are more likely to be economically disadvantaged than their non-CTE peers (Zhang & Oymak, 2018) and because earnings is a performance metric for community college CTE programs in California (CCCCO, 2018a, 2018b). Moreover, only about half of students who exit community college CTE programs in California earn a living wage within three years (LaunchBoard, 2019). Earnings vary widely for different fields of study (Bahr, 2016a, 2016b; Booth, 2015; LaunchBoard, 2019). Thus my interest in field of study choice for CTE students was driven by the need to satisfy state performance metrics and the desire to improve living wage outcomes for economically disadvantaged students.

In this chapter I provide an overview of my findings, connect my findings to the conceptual model of Hirschy et al. (2011), and propose a conceptual model for community college CTE field of study choice. I make recommendations for CTE policy and practice and offer specific recommendations to CTE leaders. Finally, I discuss the limitations of this study and make recommendations for future research.
Overview of Findings

I used the Choice of College Major Survey (CCMS) for data collection. I designed the CCMS with fixed response items for quantitative analysis and open-ended items for qualitative analysis (Johnson & Onwuegbuzie, 2004). Previous work supported earnings as a consideration in college major choice for undergraduates (Arcidiacono et al., 2012; D'Amico et al., 2012; Kugler et al., 2017; Ramirez, 2019) and students in middle school (Nugent et al., 2015); however, there was a gap in the literature for the importance of earnings in field of study choice for community college CTE students. I designed the CCMS to test earnings as a predictor of field of study choice for community college CTE students. In addition, based on literature about skills-builders and nontraditional students (Bahr, 2010; Booth and Bahr, 2012; Levin, 2007), I hypothesized that concerns about time to completion would have a relationship with field of study choice. However, neither quantitative nor qualitative analysis supported time concerns as a significant influence. Finally, the career integration variable was included in the conceptual model of Hirschy et al. (2011), and my findings support career integration as a predictor of field of study choice.

The CCMS was an original survey designed to test the relationships of earnings, time, and career integration to field of study choice. Career integration was defined by Hirschy et al. (2011) as “meaningful career-related experiences [that] may occur on and off campus and because the boundaries between school and work may be permeable” (p. 312). My outcome variable, field of study
choice, was expressed as low, medium, or high median wage. The predictor variables were earnings concerns, time concerns, and career integration. I further examined earnings concerns through item 4 on the CCMS, “I thought about earnings when I chose my major” and controlled for age and current annual income (Healey, 2014).

I found that earnings concerns and career integration were related to community college CTE field of study choice, and when controlling for age and current income, students age 25 and older and students whose current income was above living wage were more likely to have considered earnings when they selected their CTE field of study. Quantitative results showed statistical significance for earnings concerns (p<.001) and career integration (p<.05), and qualitative results were consistent with these findings. Time to completion was not statistically significant, nor did it emerge in qualitative data analysis as a factor influencing field of study choice. Instead, time was regarded as the price to enter the desired career.

Open-ended responses on the CCMS deepened understanding of earnings concerns and career integration and explored other factors in field of study choice. Qualitative responses corroborated quantitative findings for earnings concerns and career interest; however, most prominent in qualitative analysis was the factor of career interest. Students said they selected their CTE field of study because they had a plan for entering or progressing in the related career, they enjoyed the work, or they had a passion for the career. Qualitative analysis
also brought out connection to family as a factor in field of study choice, which could have reflected sociodemographic influences such as racial identity (Acevedo-Gil, 2017; Farrington, 2018). I did not consider race in data analysis because there were more than two categories and because it was not mentioned in open-ended responses. However, further study from a critical race theoretical perspective, especially considering the high response rate (55.5%) from students identifying as Hispanic/Latino and the low response rate (3.0%) from students identifying as African American / Black, would add to theory and practice and will be discussed later in this chapter.

In their responses to open-ended survey items, participants reported that family influenced field of study choice both before they made a decision (e.g., by providing career knowledge or exposure to the field of study), and while they were deciding (e.g., by being financially dependent upon the student). Thus connection to family was both an influence before field of study choice and a factor in the actual decision-making process.

Proposed Conceptual Model for Field of Study Choice

In considering the dual role of connection to family, I noticed a distinction in student responses between influential attitudes, beliefs and values the student carried into the decision-making process, and information that was considered at the time of selecting a field of study. Upon further reflection and analysis of the data, I noticed the distinction in career interest and career integration as well.

Although I did not set out to propose a conceptual model of CTE field of
study choice, my findings indicated a distinction between *influencers*, which were included in the conceptual model by Hirschy et al. (2011), and *purposeful process*, which was not included. My findings indicated a purposeful process in which students considered information at hand as they finalized their field of study choice. Because the conceptual model by Hirschy et al. (2011) was designed to explain student attainment of educational goals rather than field of study choice, purposeful process might not have been relevant in the original model. A conceptual model specific to community college CTE field of study choice would add to theory and practice. Therefore, I explain *influencers* and *purposeful process* in this section and propose a conceptual model for CTE field of study choice.

### Influencers

Influencers, operationalized as experiences that form a student’s values, attitudes, and beliefs, came from the students’ individual backgrounds. Values such as family and stable work, attitudes about the importance of careful planning, and beliefs about what constitutes a good job were already present in students by the time they started considering their field of study. Students also brought ideas about different careers from previous experience with family businesses, relatives or friends in the career, and knowledge gained from exposure to the career in middle and high school. These experiences fed into students’ thought processes as they selected their field of study.

Influencers on student field of study choice corresponded to the constructs
of student characteristics, college environment, and local community environment, as well as the career integration variable (Hirschy et al., 2011). Influencers were more constant and long-term than the transactional information of the purposeful process phase. Some influencers were the stable variables identified by Hirschy et al. (2011), and others were malleable variables that had been internalized prior to the student’s field of study choice. Influencers worked behind the decision-making process by providing a framework from which the student evaluated their options and came to decide upon a field of study.

Purposeful Process

Purposeful process describes the phase of decision-making dependent upon information in the student’s mind at the moment of field of study choice. Responses from this study revealed consideration of external, informational factors such as earnings, type of work, job demand, location of the available jobs, and the student’s perceived financial needs. This information was important to students in the short term, as they considered their options.

The purposeful process consisted of an evaluation of the information at hand. It was similar to the cost-benefit analysis described in human capital theory (Baron & Armstrong, 2012) and criticized by Oreopoulos and Petronijevic (2013). Oreopoulos and Petronijevic (2013) performed cost-benefit analysis including net present value (NPV) calculations, consideration of projected labor market demand, and student debt for a national sample of full-time employed adults in Canada. They found net gains in income after college but argued that most
students entering college have not been trained to do a full cost-benefit analysis (Oreopoulos & Petronijevic, 2013). Oreopoulos and Petronijevic (2013) acknowledged that the cost-benefit analysis by entering students would be rudimentary, and they emphasized the recurring nature of the cost-benefit decision. My findings were consistent with Oreopoulos and Petronijevic (2013).

My findings showed that students considered whether or not they would enjoy the work or have a passion for it, and they also considered earnings. Short-term needs such as their ability to financially support themselves and their families were also considered. Long-term concerns such as possibilities for career advancement, buying a house, taking family vacations with a spouse and children, and retiring were also part of the cost-benefit analysis. Interestingly, students who selected low wage fields of study appear to have been aware of earnings and given it less importance than another value, such as having a passion for the career, in their cost-benefit analysis. For example, a child development (L) student said, “I understand how much I would be earning” and had selected the field of study because “it was something I was passionate about.” Similarly, a student in human services (L) said, “Money wasn’t my main factor when choosing this career” and instead emphasized making a difference in the community. These students appeared to have given cursory attention to earnings and gone on to make their field of study choice based on other factors.

Students from medium and high wage fields of study responded similarly to open-ended items; for example, a nursing (H) and business (M) student both
listed “helping others” as the most important factor in their field of study choice. From these qualitative data, the difference between selecting a high, medium, or low wage field of study appeared to come down to career interest or passion. However, students from high and medium fields of study also reported earnings as a priority in open-ended responses, a finding that was supported by quantitative findings. For example, the business (M) student from the previous example clarified that she wanted to start a business, become financially independent, and use her business and income to help others.

The purposeful process phase fits human capital theory and answers criticisms that cost-benefit analysis is too complex (Oreopoulos & Petronijevic, 2013). Although students did not know how to perform full cost-benefit analyses, their decision was guided by what they knew. Oreopoulos and Petronijevic (2013) saw the cost-benefit analysis as sequential, which was supported by my findings. Oreopoulos and Petronijevic (2013) postulated that students would continually reevaluate costs and benefits as they acquired new information, and this is supported by my finding that older students and those who had current annual income at or above living wage were more likely to select a medium or high wage field of study. These students’ additional years and their experience of having living wage income were part of the influencer phase, and it was against this background that they evaluated earnings information during the purposeful process phase.

Purposeful process is not included in the conceptual model by Hirschy et al.
Considering my findings and using Hirschy et al. (2011) as a base, I propose a conceptual model to include purposeful process. To clarify the purpose of the proposed conceptual model, I propose field of study choice as the outcome construct rather than student success, which is the outcome construct in the conceptual model by Hirschy et al. (2011). The proposed conceptual model examines field of study choice, a pre-enrollment decision, while the original conceptual model (Hirschy et al., 2011) focused on post-enrollment, when the student would have already selected a field of study.

Finally, I added a dotted line from the outcome construct, field of study choice, back to influencers because the process may repeat itself several times over the course of the student’s educational journey (Acevedo-Gil, 2017; Bahr, 2016b; Booth & Bahr, 2012; Levin, 2007). The proposed conceptual model is shown below as Figure 2, and the components are explained following.
In the proposed conceptual model, influencers correspond with the student characteristics, college environment, and local community environment constructs and the career integration variable of the conceptual model of Hirschy et al. (2011), which were supported by the findings in this study. Purposeful process is a transactional phase in which the student gathers and evaluates information. The student decides upon a field of study based on influencers and purposeful process. The cycle can repeat, especially for nontraditional students or those following a nonlinear path (Acevedo-Gil, 2017; Bahr, 2010; Booth & Bahr, 2012; Levin, 2007).

An example of a participant whose field of study choice fit the proposed
conceptual model was a police academy student. The student’s age was 25-29 (older than traditional college students), his current annual income was $45,000-$54,999 (high), and he replied “agree” to fixed response item 4, *I thought about earnings when I chose my major*. This response fits the purposeful process phase of the proposed conceptual model because the information was considered when he made his decision. In addition, this participant’s responses to open-ended survey items shed light on the influencer phase of his field of study choice. He selected his major because he wanted “a steady job,” and he recommended new students “be ready to work hard.” This participant’s values of stability and hard work acted as influencers on his field of study choice.

A second police academy student described influencers from the student characteristics construct and career integration variable in his response to item 41, “How would you describe the role of your community in your decision to study this major?” This participant replied, “Community played a huge role in my decision including family, friends, and past job experiences.” This response included the trifecta of family, community (influencers under the student characteristics construct), and past job experiences (under the career integration variable) (Hirschy et al., 2011).

Recommendations for Policy and Practice

My findings suggest that students are more likely to consider earnings in their field of study choice if they are age 25 or older or if their current income is at or above regional living wage. In addition, influencers like family, community, and
previous exposure to the career can affect how students evaluate the information gained during the purposeful process phase. Educators at all levels need to (a) support nontraditional students who skew older and employed (Bahr, 2010; Levin, 2007; Zhang & Oymak, 2018), (b) work with influencers by communicating and providing opportunities for exposure to different careers, and (c) give the student the information they need during the purposeful process phase to make an informed decision. These broad goals require specific actions by CTE leaders at the state and community college. Below are some such actions for state and community college CTE leaders.

Recommendations for State Leaders

As discussed in Chapter 2, California’s Salary Surfer tool provides median earnings information for hundreds of occupations; however, Salary Surfer does not provide regional living wage data (Booth, 2015). I recommend state investment in Salary Surfer or a similar online tool to add a regional living wage benchmark so that students and their families can compare median earnings to living wage in their local community. In addition, state investment should be sufficient to make Salary Surfer available and attractive to families of students from elementary through high school. For example, Nugent et al. (2015) found an increase in self-efficacy after a STEM summer camp for middle school students, and they linked self-efficacy to selecting a STEM career. Self-efficacy is also a malleable variable under the student characteristics construct in the conceptual model of Hirschy et al. (2011), and I consider self-efficacy to be an influencer in
my proposed conceptual model. Summer camps like those studied by Nugent et al. (2015) could include a career awareness activity with Salary Surfer. Similar activities in the summer or during the school year could also include families. My findings showed family influence on students’ field of study choice. If families are aware of career options, median earnings, and regional living wage, they can share the information with students from elementary through high school. Moreover, family members can use the information to join the population of nontraditional students that enroll in community college CTE programs. Nontraditional students and their influencers should be targeted, as they constitute the majority of community college CTE students (Levin, 2007; Zhang & Oymak, 2018).

The state should adopt a policy of continuous communication about career and educational options and implement a comprehensive information campaign to reinforce the policy. This recommendation aligns with the guided pathways model adopted by California and 24 other US states (Jenkins et al., 2018). The first pillar of guided pathways, *clarify the paths* (Pathways Collaborative, 2017, p. 1), calls for colleges to provide “detailed information on target career and transfer outcomes” (Pathways Collaborative, 2017, p. 1). This information would be especially useful during the purposeful process phase, when students consider information at hand.

In open-ended responses to the CCMS, participants in high and medium wage fields of study talked about doing research before making a selection.
D'Amico et al. (2012) found that students who used institutional sources of information such as guidance counselors and career websites had greater college-career alignment than students who relied on family networks. However, Acevedo-Gil (2017) emphasized the importance of family and community as support and information networks for Latinx students. My findings indicate that family connection is important in CTE field of study choice, therefore, my recommendation is that state leaders implement practices to ensure that families have up-to-date, accurate information. This information would be especially useful during the influencer phase, when students’ long-term values, attitudes, and beliefs take shape.

As mentioned above, the recommendation to share information is consistent with the guided pathways model (Pathways Collaborative, 2017). In addition to providing information to students, state leaders should ensure inclusion of family and community. Influencers should receive college and career information where they are – in their communities. A comprehensive information campaign would include strategies for localized messaging on career possibilities, median earnings, regional living wage benchmarks for different family compositions, and programs available at the local community college. Information should reach students contemplating their options during the purposeful process immediately before field of study choice, and influencers throughout the life of the student. Responsibility for these recommended practices can be shared with community colleges, as described in the next
Recommendations for Community College Leaders

Funding for and effectiveness of community college CTE programs depends on connections with business and industry (CCCO, 2018a, 2018b; Esch & Supinger, 2017; Harrington et al., 2018), making CTE leaders easy targets for critics who see community college as an instrument of inequity (Ayers, 2005; Brint & Karabel, 1989; Clark, 1960; Dougherty, 1994; Levin, 2007). The derision of community college, especially CTE, and the favored view of four-year universities persists to the present day. For example, Strong Workforce Program (SWP) performance metrics, which include earnings as a positive outcome whether or not the student completed a degree or certificate, are more favorable to four-year plans than CTE certificates. SWP incentive funding is awarded on a point system, and CTE students who transfer from a community college to a four-year university represent two points for every one point awarded for completion of a CTE certificate (Roberts et al., 2018). I make the following three recommendations for CTE leaders with these ongoing pressures in mind.

Recommendation 1: Actively Provide Information. Students in the purposeful process phase consider the information they have at the time and are influenced by stable and malleable variables from their background and past experience. Community college leaders can contribute to informed decision-making by keeping college websites up to date and ensuring adequate staffing of college advising and outreach. Websites and advising are specifically mentioned
by Bailey et al. (2015) as integral to the first pillar of the guided pathways model. If the state embarks upon an information campaign as recommended above, community college leaders can actively provide information by collaborating and cooperating with the state and offering college outreach activities to complement the state efforts. For example, outreach activities such as STEM summer camps (Nugent et al., 2015) expose students to careers prior to the purposeful process phase. Such activities can also strengthen self-efficacy, which was found to be a predictor of college choice (Nugent et al., 2015) and is a malleable variable in the conceptual model of Hirschy et al. (2011) as well as an influencer in the proposed conceptual model.

**Recommendation 2: Earnings.** The purpose of this study was not to encourage students to select high wage fields of study. There is a societal need for skilled workers in human services, culinary, child development, and other fields that show low median wages after completion, and as indicated in this study, there are students drawn to these fields regardless of median wage. Moreover, median wages represent the middle of the pay scale (Salkind, 2017), and a student’s actual earnings could be above or below the median wage. My recommendation to CTE leaders is not to dissuade all students from low wage fields of study, nor do I anticipate standardization of earnings across all fields of study (low, medium, and high). However, the benefits of high earnings have been well documented (Baron & Armstrong, 2012; D’Amico et al., 2012; Oreopoulos & Petronijevic, 2013). My recommendation, therefore, is to ensure that students
make informed decisions. My findings showed students consciously selected low wage fields of study because they had other financial support or because they felt passionate about the career. Up-to-date information should be ubiquitous, and CTE leaders should ensure that students and their families find it engaging and easy to use. Currently, earnings and living wage tools such as Salary Surfer and Insight CCED are not widely used by the public (Booth, 2015; Pearce & Manzer, n.d.), and my recommendation above to state leaders is intended to address this shortcoming. Additionally, my recommendation to community college leaders to ensure adequate staffing for outreach and advising is paramount to achieving the three broad goals of supporting nontraditional students, introducing information and tools to the influencer phase, and providing reliable information during the purposeful process phase. Moreover, these recommendations are consistent with the guided pathways model adopted by CCC and many community college systems across the US (Bailey et al., 2015; Jenkins et al., 2018; Pathways Collaborative, 2017).

Finally, information should be tailored for nontraditional students, including those who leave college and return later to take additional classes or complete another credential. Nontraditional students are far from homogenous (Levin, 2007), and community college leaders can use tools such as the Community College Survey of Student Engagement (CCSSE), Student Campus Climate Survey (SCCS), and CTE Outcomes Survey (CTEOS) to understand the students at their institution (“Surveys,” n.d.). Nontraditional students may be
skills-builders (Bahr, 2016b; Booth, 2014) or following a nonlinear path (Acevedo-Gil, 2017). Even when students leave college without completing a degree or certificate, college classes have been found to lead to higher earnings (Bahr, 2016b; Booth, 2014; Shulock et al., 2012). It is, therefore, a sound investment in student wellbeing and satisfaction of CTE performance metrics (CCCCO, 2018a) for community college leaders to reach nontraditional students with information useful to the purposeful process phase.

My final recommendation for community college leaders, greater use of apprenticeships, is an example of a strategy that has been shown to be effective with nontraditional students (Klor de Alva & Schneider, 2018; Koller, 2018).

Recommendation 3: Greater Use of Apprenticeships. My findings showed that as students got older, they were more likely to consider earnings when they selected their field of study. Similarly, students were more likely to consider earnings if they already had annual income at or above living wage levels. Since one of the purposes of this study was to inform strategies to improve earnings outcomes for CTE and economically disadvantaged students, I recommend greater use of apprenticeships as a strategy to achieve higher earnings outcomes.

Apprenticeships are increasingly available across industry sectors (Koller, 2018), and federally registered apprenticeships require "a schedule of progressively increasing wages for the apprentice with an entry level that is at least minimum wage" (Collins, 2016, p. 3). Community colleges are eligible to
apply for state and federal grants to help develop and strengthen apprenticeship programs, and they have resources at their disposal such as the state Division of Apprenticeship Standards (“About the Division of Apprenticeship Standards (DAS), n.d.). The average age of apprentices in the US is 28, which is older than the traditional college student and consistent with nontraditional community college CTE students (Levin, 2007; Zhang & Oymak, 2018). Thus CCC leaders should work with CTE instructional and counseling faculty, business and industry partners, and other stakeholders to develop apprenticeships in industry sectors that offer median wages at or above the regional living wage. Apprenticeship programs should include a guidance component that ensures counselors are familiar with the benefits of apprenticeship and present the option to students. These CCC and stakeholder work groups should write and submit grant applications to establish new apprenticeship programs and implement tracking systems to capture ongoing apportionment. Finally, CCC should ensure that metrics are captured and reported for the enrollment, completion, employment, and earnings of all students in the apprenticeship programs.

Youth apprenticeships should also be available as options for students entering community college. My findings indicated that in addition to information gained in the purposeful process phase, students decided upon a CTE field of study based on influencers that had been part of their lives up to that point. As shown in my proposed conceptual model, influencers included career knowledge gained from family, community members, and exposure to the work environment.
Youth apprenticeships are available to students as young as 16, serve high school students and out-of-school youth, and provide exposure to the work environment (Collins, 2016). Students earn as they learn, and the required wage increases correspond with skills gained and time spent in the apprenticeship program. The average apprenticeship is four years (Collins, 2016). Ideally, youth apprentices complete their program with a high school diploma, a nationally recognized credential, and employment at or above regional living wage (Collins, 2016; Koller, 2018). If former youth apprentices later decide to return to college and pursue additional credentials, my findings showed that they would be more likely to consider earnings because at that point, they will be older and already have income at or above living wage. Thus my recommendation is that CCCs develop and maintain youth apprenticeship programs in addition to the adult apprenticeship programs previously discussed. For youth apprenticeships, high school counselors and guidance staff from agencies serving out-of-school youth should be included in professional development designed to familiarize employees with apprenticeship programs.

**Instrument and Proposed Conceptual Model for Career Technical Education**

**Field of Study Choice**

I developed two new tools in this study to add to theory and practice. Both the Choice of College Major Survey (CCMS) and the proposed conceptual model for CTE field of study choice should be further tested, refined, and used for educational research. I explain these recommendations in the next section.
Recommendations for Future Research

Both the proposed conceptual model for CTE field of study choice and the CCMS should be further tested for reliability and validity and refined through additional study. In addition, analysis by race within a critical race theoretical framework would be useful in understanding CTE field of study choice. I now discuss recommendations for future research.

Choice of College Major Survey

I recommend further testing and use of the Choice of College Major Survey. The CCMS is a new instrument and has limitations described in the next section; however, it was useful in this study for identifying factors related to field of study choice for community college CTE students. The combination of fixed response and open-ended items elicited rich data about the importance of earnings, connection to family, career interest, and career integration. Analysis by age and annual income provided deeper insight into the importance of earnings in field of study choice for subsets of the student population. The survey was designed to examine field of study choice by community college CTE students and was validated for this study. The CCMS adds value to the field because its function is not fully addressed by other instruments (M. Pham, CTEOS statewide director, personal communication, February 22, 2019; “Surveys,” n.d.). Therefore, I recommend addressing the limitations of the CCMS as described in the next section, and continuing to refine and use the instrument to increase knowledge and understanding of community college CTE field of study choice.
A revised CCMS could include fixed response and open-ended items for all variables that were not anticipated in this first administration. For example, fixed response items could define and measure career interest, interest in or passion for the field of study, and influence of family and community. Conversely, qualitative items could be added and analyzed to correspond to variables such as gender, age, and income. In both cases, careful item construction would need to follow best practices for survey design and research (Fan & Yan, 2010; Krosnick & Presser, 2010) and undergo rigorous testing for reliability and validity (Fan & Yan, 2010; Field, 2013).

**Proposed Conceptual Model for Career Technical Education Field of Study Choice**

As previously discussed, I did not set out to propose a new conceptual model for community college CTE field of study choice; however, data from this study led to a distinction between influencers and purposeful process. I distinguished between factors already present within the student (influencers) and information gathered as part of the decision-making process (purposeful process). I included variables from the conceptual model of Hirschy et al. (2011) in the influencers phase, and I added purposeful process as a new phase in field of study choice. Purposeful process is a short, transactional phase during which students gather and evaluate information such as earnings, type of work, location of possible jobs, career advancement and retirement possibilities, and training necessary to enter the career. I added purposeful process based on the findings
in this study.

The next indicated step is testing the proposed conceptual model. I recommend further use of the proposed conceptual model to study and explain CTE field of study choice for community college students. The model should be further tested and validated through quantitative, qualitative, and mixed methods research.

**Analysis by Race from a Critical Race Theoretical Framework**

Further study of CTE field of study choice from a critical race theoretical framework would add to theory and practice. Based on US Census data for San Bernardino County, the percentage of participants identifying as African American / Black was lower than expected (7.6%), and the percentage of participants identifying as Hispanic / Latino was higher (55.5%) than expected. I attributed this to small sample size, but further research could approach the discrepancy from a critical race perspective. My sample consisted of community college CTE students in high, medium, and low wage CTE fields of study. Quantitative research could examine race / ethnicity composition of different CTE fields of study, and qualitative research could contribute to understanding of the lived experience of students of color selecting a CTE field of study. This would be especially relevant because CTE programs serve a higher percentage of students of color than non-CTE programs (Zhang & Oymak, 2018).

In addition to contributing to understanding the factors that contribute to field of study choice for community college CTE students of color, an analysis by
race could help explain the emergence of family as an important influence in qualitative responses but not in quantitative. The sample (N=200) comprised a majority of participants who identified as Hispanic / Latino (55.5%). LatCrit authors (Acevedo-Gil, 2017; Farrington, 2018) have identified family as an important influence among Latinx families, and the high percentage of Hispanic / Latino participants in this study could explain the emergence of family as an important influence. Further study would contribute to knowledge in the field, and the critical race theoretical perspective would provide a useful framework for understanding the findings.

Limitations of the Study

The limitations of this study were due to small sample size and the creation of a new survey. First, the small sample size was vulnerable to disproportionate representation from a few fields of study. Second, the Choice of College Major Survey (CCMS) was a new instrument that had not yet been informed by actual survey responses. This led to the third limitation, which was the failure to address all possible factors that influence community college CTE field of study choice. I will address each of these limitations in this section.

Limitations Based on Sample Size

The sample size (N=200) was adequate for statistical analyses; however, there was overrepresentation from two fields of study (police academy and nursing) and underrepresentation from fields of study like business and culinary. Most CTE fields of study were not represented in this study; with hundreds of
CTE certificates and degrees, only a very large sample would include comprehensive representation of all CTE fields of study.

The range of Career Technical Education (CTE) fields of study in this study was narrow, which could have affected the results. My research design required a minimum of one field of study each to represent high, medium, and low median wage levels. The high concentration of respondents from the public safety sector (male-dominated), diesel technology (male-dominated) and nursing (female-dominated) affected gender demographics. In addition, the sample did not match population demographics for race/ethnicity; specifically, the sample showed a lower-than-expected percentage of Black / African American students (3.0%) and a higher-than-expected percentage of Asian students (9.5%). Population data for San Bernardino County showed 9.4% Black / African American and 7.8% Asian. A larger sample size may have more closely matched gender and race demographics for San Bernardino County.

The high percentage of participants from a few fields of study was another limitation of small sample size. Of the sample (N=200), police academy (n=53) and administration of justice (n=36) together comprised 44.5% of the fields of study reported. Diesel (n=35) comprised 17.5%, and nursing (n=34) comprised 17% of the sample. This narrow range of fields of study was due to the stratified sampling I used in my research design. The technique was effective because it provided a sufficient number of participants in high, medium, and low wage fields of study, but it may have limited the responses of the CTE population. A larger
study inclusive of all CTE fields of study would add to theory and practice.

Small sample size also may have skewed demographic data on age, employment status, and earnings. Demographic data showed a high percentage of participants who were male, age 20 through 29, full-time employed, and reported annual earnings above $44,999. This can be attributed to the disproportionate number of participants from police academy, administration of justice, and diesel. Again, a larger sample size with representation from all CTE fields of study would address this limitation.

**Limitation Based on New Instrument**

I developed the Choice of College Major Survey (CCMS) only after searching for an existing instrument that addressed my research questions and had already passed rigorous testing for reliability and validity. Finding none, I created and tested the CCMS as described in Chapter 3. After administering the CCMS and analyzing the results, I would change several items, reorganize the domains, and test the instrument again. Ideally, I would have a larger sample spanning multiple colleges and CTE fields of study. I included additional detail in my recommendations for future research.

**Failure to Address all Possible Factors**

Based on my literature review and preliminary findings from piloting the CCMS, my study focused on three predictor variables and one outcome variable. The predictor variables were earnings, time to completion, and career integration. The single outcome variable, field of study choice, was represented by choice of
a major in a high, medium, or low wage field of study. These factors addressed my research questions; however, additional statistical techniques such as factor analysis may reveal other predictor variables (Muijs, 2011). For example, I noted the complexity of the career integration variable. Factor analysis may help break down career integration into variables and influences that can be analyzed quantitatively and explored in further qualitative and mixed methods study (Muijs, 2011). I did not perform factor analysis in this study because my research purpose, research questions, and review of the literature led me to focus primarily on earnings (Bahr, 2010; Booth, 2015; CCCCO, 2018a, 2018b; Esch & Supinger, 2017; Pearce & Manzer, n.d., Xu & Trimble, 2016).

The influence of family was absent from my quantitative results and emerged as a theme in qualitative analysis. Other influences included career interest and passion. These qualitative themes emerged in open-ended responses but were not captured in fixed response items. Conversely, qualitative items did not capture the effects of demographic variables such as gender, age, and income level which were shown to be statistically significant and strong in quantitative analysis.

Conclusion

This study examined factors influencing field of study choice by community college CTE students. Of particular interest was the importance of earnings. I created and validated the Choice of College Major Survey (CCMS), a new instrument with 42 fixed response, categorical, and open-ended survey items.
Through quantitative and qualitative analysis, I found that earnings and career interest, including passion for the career, were important predictors of field of study choice. Connection to family was important and merits additional study. I proposed a new conceptual model to describe community college CTE field of study choice. I used the conceptual model of Hirschy et al. (2011) as the base for my proposed model. I differentiated between influencers of field of study choice, such as student characteristics, family, and career integration, and informational factors considered during the purposeful process of selecting a field of study.
Choice of College Major

Thank you for taking this survey! Please read each statement carefully before answering. Please note that "major" is used to describe the field of study you are currently enrolled in.

A. College and Major

Please fill in your college and major.

1. Name of college: ____________________________________________
2. Major / field of study: ________________________________________

B. Student Characteristics

For each statement, circle the option that best describes whether you (1) Strongly Disagree, (2) Disagree, (3) Neither Disagree nor Agree (Neutral), (4) Agree, or (5) Strongly Agree.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>My major will help me to earn a high salary.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I thought about earnings when I chose my major.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Earnings were the most important reason I chose my major.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I expect to earn more money after I finish my training.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I need to earn more money to support myself.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I need to earn more money to support my family.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I worry about money a lot.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>In order to have the lifestyle I want, I need to earn a lot of money.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Please continue to the next page.
For each statement, circle the option that best describes whether you (1) Strongly Disagree, (2) Disagree, (3) Neither Disagree nor Agree (Neutral), (4) Agree, or (5) Strongly Agree.

<table>
<thead>
<tr>
<th></th>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>My main priority is getting a job in my field of study.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12</td>
<td>I need to finish my training as quickly as possible.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13</td>
<td>I want to finish my training as quickly as possible.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14</td>
<td>I chose my major so I could finish quickly.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15</td>
<td>I chose my major so I could get a job quickly in my field of study.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16</td>
<td>Before I enrolled, I knew which jobs I could get in my field of study.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17</td>
<td>Before I enrolled, I knew how much I could earn in my field of study.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18</td>
<td>Time was the most important reason I chose my major.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>19</td>
<td>My family needs me to get a job quickly.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20</td>
<td>I chose this major because of influence from my parents.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Please continue to the next page.
For each statement, circle the option that best describes whether you (1) Strongly Disagree, (2) Disagree, (3) Neither Disagree nor Agree (Neutral), (4) Agree, or (5) Strongly Agree.

<table>
<thead>
<tr>
<th></th>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.</td>
<td>I chose this major because of influence from my relatives.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>22.</td>
<td>I chose this major because of influence from friends.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>23.</td>
<td>I took class(es) in high school related to this major.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>24.</td>
<td>I learned about this major in high school.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>25.</td>
<td>I chose this major because of influence from a high school teacher.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>26.</td>
<td>I chose this major because of influence from a high school counselor.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>27.</td>
<td>I chose this major because of influence from another high school employee.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>28.</td>
<td>I know how much I can earn after I finish my training.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>29.</td>
<td>My college has a clear pathway from my major to related jobs.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

You're more than halfway done! Please continue to the next page.
C. Demographic Information

30. What is your gender? __________________________

For questions 31-36, please circle the one response that best describes you.

31. Immediate educational goal: Certificate  Associate’s Degree  Classes only – no degree  Other

32. Race: African American  American Indian/ Native American  Asian  Hispanic / Latino  Pacific Islander  White/ Non-Hispanic  Other/ more than one


34. Current employment status: Working 35 or more hours per week  Working 16-34 hours per week  Working 1-15 hours per week  Not working, currently looking for work  Not working, not currently looking for work

35. Financial situation: Parents are supporting me  I support myself  I support / help support myself and my spouse / children  I support / help support myself and my siblings / parents  I support / help support myself, my spouse, my children, and other family members.

36. Annual income: I don’t know or less  $24,999  $25,000-34,999  $35,000-44,999  $45,000-54,999  $55,000 or more

Almost there! There’s a prize at the end! Please continue to the next page.
D. Short Answer

Please fill in your answer to the following questions.

37. In your experience, what factors were important in selecting your college major?

38. What is your plan after you finish your training at this college?

39. To what extent did you consider your future earnings when you chose your major?

40. If you could offer any recommendations to students selecting a major, what recommendations would you offer?

41. How would you describe the role of your community in your decision to study this major? Your community may include your family, friends, faith community, jobs center, or other groups you belong to.

42. Is there anything else you would like for us to know about how you selected your major?

43. Would you be willing to be interviewed regarding your choice of college major?
   ___Yes ___No
   *If you are willing to be interviewed, please provide your email on the next page.*

   All done! Please continue to the next page for a prize opportunity!
Please check these boxes if they apply to you.

☐ I am willing to be interviewed regarding my choice of college major.

☐ Please enter me in the drawing for one of six (6) Amazon gifts cards of $30 each.

Email address* ________________________________________________

* If you do not check a box, you do not need to enter your email address.

Your email address will be used only for purposes stated above. After the study, your email address will be deleted. Your confidentiality will be maintained throughout the process.

Thank you for completing this survey! Your responses are greatly appreciated and will contribute to knowledge about college students.

Note. The Choice of College Major Survey is an original instrument created for this study by the researcher, Karen S. Childers.
APPENDIX B

INFORMED CONSENT
Choice of College Major Study
Informed Consent

The study in which you are being asked to participate is designed to examine and explore how students decide upon their field of study at community college. This study is being conducted by Karen Childers under the supervision of Dr. Edna Martinez, Assistant Professor of Educational Leadership and Technology, California State University, San Bernardino. This study has been approved by the Institutional Review Board, California State University, San Bernardino.

PURPOSE: This study looks at factors that might have been important to you when you chose your major or field of study. We are only including students in degree or certificate programs within Career Technical Education (CTE). Our research asks about your thought process as you selected your field of study. We are interested in factors you considered when making your decision.

DESCRIPTION: The study will consist of a survey with a total of 44 items. Most are scale items that ask you to rate statements on a scale of 1 to 5, based on how much you disagree or agree with the statement. In addition, there are 6 open-ended questions where you can write your own response. There are 3 short fill-in-the-blank questions asking for your major, college, and gender. Finally, there are 6 demographic questions toward the end of the survey.

The Choice of College Major Survey (CCMS) can be taken online or in person. Online option. A link to the online survey will be provided to you. The online survey link allows access to a fillable survey.
In person option. A paper survey will be offered in person on campus by Karen Childers at (951) 212-5322 or karen.childers9992@coyote.csusb.edu.

AMAZON GIFT CARDS: Students who complete the Choice of College Major Survey will be eligible for a drawing for one of six (6) Amazon gift cards of $30 each. If you would like to participate in the drawing, there is a space at the end to put your email address. We will only use your email address for the drawing, and it will be deleted after the survey and drawing have concluded. For more information, please see the section below regarding confidentiality.

PARTICIPATION: Your participation is completely voluntary, and you do not have to answer any questions you do not wish to answer. If you decide not to participate, there will be no penalty.

CONFIDENTIALITY
No one will see your survey responses except the researchers. Your participation and responses in this study are confidential. To further protect your
confidentiality, your email address will be separated from your survey responses prior to data entry and analysis. We request your email address only for purposes of contacting you for an interview or for letting you know if you win the drawing for one of six $30 Amazon gift cards. Your email address will be deleted / shredded after the drawing has concluded.

The survey itself does not ask for identifying information. Paper surveys will be administered and collected by Karen Childers and stored in a locked filing cabinet. Online survey responses will automatically go to a password-protected drive. Survey responses will be destroyed three (3) years after receipt.

DURATION: We believe most students will be able to complete the CCMS in 15 minutes or less.

RISKS: No foreseeable risks are associated with this study.

BENEFITS: We do not foresee any direct benefits for this study. Indirect benefits of this study include increased knowledge that may help educators and policymakers to plan effective CTE and student services programs for community college students. Your participation will help the researchers to gain a more complete understanding of how students decide upon a field of study.

CONTACT: If you have questions about this study or your rights as a study participant, please contact Karen Childers at (951) 212-5322 or karen.childers9992@coyote.csusb.edu. In the event of a research-related injury, please contact or Dr. Edna Martinez, Assistant Professor of Educational Leadership and Technology, California State University, San Bernardino, (909) 537-5676 or emartinez@csusb.edu, or Michael Gillespie, IRB Compliance Officer, at (909) 537-7588 or mgillesp@csusb.edu.

RESULTS: The results of this study will be published in a dissertation by Karen Childers, a doctoral candidate at California State University, San Bernardino (CSUSB). The dissertation will be available at ProQuest and through the CSUSB Office of Doctoral Studies, College of Education Building, Room 335, 5500 University Parkway, San Bernardino, CA 92407. Results may also be disseminated at educational events and conferences and through publications.

CONFIRMATION STATEMENT:

I understand that I must be 18 years of age or older to participate in your study. I have read and understand the consent document and agree to participate in your study.
APPENDIX C

EMAIL INVITATION
Subject: Choice of College Major Survey

Dear [Student],

You are invited to participate in a survey regarding your experience in selecting your field of study at this college.

Students who complete the optional survey will have the opportunity to enter into a drawing for one of six, $30 Amazon gift cards. If you are interested in taking the survey, please click on the link: https://docs.google.com/forms/d/e/1FAIpQLSe6kb-Rbn6QgSt7uqyNCx6FD6zYd7_YE056NnJYMlijlqwMjw/viewform?usp=sf_link

The survey will close on [date]. We expect that most students will complete the survey in 20 minutes or less. Survey responses are confidential.

If you prefer to take the survey in person, please contact Karen Childers at Karen.childers9992@coyote.csusb.edu or (951) 212-5322 for information about the date, time, and location.

The survey is part of a study by Karen Childers, doctoral candidate at California State University, San Bernardino. The purpose of the study is to examine factors that influence students when they select a field of study. Findings will be published and accessible to educators, policy makers, and students. You can find more information at the link above, or by contacting Ms. Childers.

Your participation in this optional survey is greatly appreciated.
APPENDIX D

INSTITUTIONAL REVIEW BOARD LETTER
September 9, 2019

CSUSB INSTITUTIONAL REVIEW BOARD
Protocol Change/Modification
IRB-FY2019-293
Status: Approved

Ms. Karen Childers and Prof. Edna Martinez
COE - Doctoral Studies
California State University, San Bernardino
5500 University Parkway
San Bernardino, California 92407

Dear Ms. Childers and Prof. Martinez:

The protocol change/modification to your application to use human subjects, titled "The Importance of Earnings in CTE Field of Study Choice" has been reviewed and approved by the Chair of the Institutional Review Board (IRB). A change in your informed consent requires resubmission of your protocol as amended. Please ensure your CITI Human Subjects Training is kept up-to-date and current throughout the study.

You are required to notify the IRB of the following by submitting the appropriate form (modification, unanticipated/adverse event, renewal, study closure) through the online Cayuse IRB Submission System.  

1. If you need to make any changes/modifications to your protocol submit a modification form as the IRB must review all changes before implementing in your study to ensure the degree of risk has not changed.
2. If any unanticipated adverse events are experienced by subjects during your research study or project.
3. If your study has not been completed submit a renewal to the IRB.
4. If you are no longer conducting the study or project submit a study closure.

You are required to keep copies of the informed consent forms and data for at least three years.

If you have any questions regarding the IRB decision, please contact Michael Gillespie, Research Compliance Officer. Mr. Gillespie can be reached by phone at (909) 537-7588, by fax at (909) 537-7028, or by email at mgil esp@csusb.edu. Please include your application identification number (above) in all correspondence.

Best of luck with your research.
Sincerely,

*Donna Garcia*

Donna Garcia, Ph.D, IRB Chair
CSUSB Institutional Review Board

DG/MG
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