ABSTRACT

DIXON, COCOA TUCKER. Impact of Community College Baccalaureate Programs on State-Level STEM Baccalaureate Degree Production (Under the direction of Dr. Paul Umbach).

Almost 30 states in the U.S. have authorized their community colleges to confer baccalaureate degrees without a partnership with a traditional four-year institution. The intention of four-year degree programs at select community colleges is to increase four-year degree production in areas with high labor market demand but a low supply of qualified workers. High-demand areas include science, technology, engineering, and mathematics (STEM) fields such as nursing, computer technology, and science education. Previous studies show that direct and indirect costs associated with completing the four-year STEM degree at traditional four-year institutions serve as barriers to program completion and impact historically underserved students disproportionately. Community colleges in the U.S. reduce impediments to earning a bachelor's degree in STEM by offering a more affordable and accessible route. Community colleges also serve a diverse population of students, potentially affecting the number of minority and marginalized students pursuing and completing the four-year STEM degree. This study sought to determine the impact of community college baccalaureate (CCB) degree programs on three main post-CCB implementation effects: state-level differences in the overall number of four-year STEM degrees awarded, the number of STEM degrees awarded to women, Black, and Hispanic students, and state-level changes in the proportion of women, Black, and Hispanic students earning STEM baccalaureate degrees. I used a difference-in-differences (DiD) research design and extracted degree completion data from the Integrated Postsecondary Education System (IPEDS) for all degree-granting U.S. public and private two-year and four-year institutions to compose a national dataset. The dataset spanned years 1990 to 2019, with treatment occurring in multiple years across states. The treatment group for this study comprised states with an active

CCB policy, CCB STEM program, and CCB STEM graduates. The control group encompassed states lacking these characteristics. I found mixed results for the overall number of four-year STEM degrees produced at the state level and no statistically significant effects elsewhere. Therefore, I conclude that CCB-implementation has had minimal impact on four-year STEM degree attainment in the short term. The results of this study inform policymakers of the effectiveness of CCB programs and their ability to increase four-year STEM degrees, especially for historically underserved students.

Impact of Community College Baccalaureate Programs on State-Level STEM Baccalaureate Degree Production

By
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A dissertation submitted to the Graduate Faculty of
North Carolina State University
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

Educational Leadership, Policy, and Human Development

Raleigh, North Carolina

2021

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DEDICATION

I dedicate this dissertation to my late mother and brother. I know you are looking down on me, but I just wanted to let you know that I DID IT!

BIOGRAPHY

Cocoa Tucker Dixon is an educator who has assumed this role for almost 15 years. She currently holds the title of Assistant Professor of Biology at Wake Technical Community College (WTCC). However, her road to academia has many turns. She holds a bachelor of science in Biology from Shaw University, located in Raleigh, NC. With this degree, she began teaching 7th-grade science in 2007 at a middle school through lateral entry. This same year, she enrolled in the NC TEACH program, an alternative licensure program for lateral entry teachers, at North Carolina State University, located in Raleigh, NC. She completed the program and taught middle grades science for some years. During her time as a middle school teacher, she also coached the cheerleading team at the middle school and accepted a position as Head Cheerleading Coach at Shaw University.

In 2010, she pursued her master of science in biology from North Carolina Central University, located in Durham, NC. As a graduate student, she worked as a research and teaching assistant. Her graduate research explored genetic polymorphisms associated with prostate cancer in Black men. After graduation in 2012, she worked as a healthcare information technology consultant, training medical professionals at various hospitals. She also earned a Graduate Certificate in Public Health from the University of North Carolina Chapel Hill. In 2015, she accepted an adjunct position to teach general biology lab courses at Wake Technical Community College, becoming a full-time instructor in 2016. She earned the rank of assistant professor in 2020 and currently fills many leadership roles across the college, from course development to college-wide strategic plan initiatives.

Outside of her professional duties, she is a loving and dedicated wife to Keno Dixon and mother to Aniko Dixon. She loves traveling and spending time with family and friends. Occasionally, sleep finds her, and she enjoys that as well!

ACKNOWLEDGEMENTS

First, I want to thank the MOST HIGH! I can do all things through Christ who strengthens me (Philippians 4:13 NKJV). Throughout this journey, you've constantly reminded me that no one can climb a smooth mountain. The rough edges are for climbing, and the striations tell a story. Oh boy, do I have a story to tell! Along the way, you blessed me with a beautiful and brilliant baby girl, but you also called my big brother, my heart, one of Roxanne's three children, Jennings Tucker, home. God is faithful, who will not allow you to be tempted beyond what you are able, but with the temptation will also make the way of escape (I Corinthians 10:13 NKJV). Even on the days when my thoughts were unclear and depression and doubt consumed me, you provided the strength I needed to persevere. You guided me to the finish line. Thank you, Lord!

Thank you to my husband, Keno Dixon, and my daughter, Aniko Dixon, for riding alongside me on this four-and-a-half-year voyage. Pursuing this doctorate was a sacrifice for each of us, but we made it to the finale! To my husband, thank you for supporting me in any and everything I choose to do. I know my ambition stresses you at times, but you never complain. You always encourage me to GO FOR IT! To my sweet baby girl, thank you for sharing your mommy with the computer. At only two years old, you've recognized that the laptop is stealing my attention from you. "Don't bring the [com]puter, Mommy…no, don't do the work", is what you often say. I can not wait until you are older to remind you of this. I hope you get a good chuckle.

Thank you to my family and friends. I certainly needed my village during this time, and you guys came through every time. From talking me through panic attacks, supporting me through my first full-term pregnancy, to watching after Aniko, to wiping my tears when my

brother passed, you guys were there. Thank you, Nana (Delores Ross), Ashley Tucker, Teresa Nash, Linda Dixon, Mia Kennedy, Leandres Fowlkes, Zad Valentin, Capricia Burrell, Joyce Booth, Christina Jackson, Erin Doughney, Burrell, Tucker, Luck, Dixon, and Deberry families.

Thank you to my cohort and accountability group mates: Heather Ryan, Lori Durako Fisher, Dr. Rachel Worsham, Chelsea Smith, Dr. Ezinne Ofoegbu, Kevin Singer, Dr. Haruna Suzuki, Dana Thomas, and Grey Reavis. I am forever grateful for your support and encouragement. Lori, Rachel, Heather, Chelsea, I know you guys were sick of proofreading my work and explaining things to me, but you did it anyway. LOL! I would not have made it through without you. Thank you!

Thank you to my dissertation committee. You each brought something different to the table. Dr. Paul Umbach, as the adage goes, "the sky is the limit," but you found a side door and pushed me through it. Dr. Joy Gayles, we come from similar backgrounds, and you understood the importance of community and building relationships in a space that can feel unfamiliar and daunting at times. I thank you for the many gatherings at your home, the impromptu conversations in passing, and for putting together the accountability group that kept me on track. Dr. Anna Egalite, I thank you for your quantitative methods and causal inference courses. Your teaching style matched my learning style and solidified my decision to do a quantitative research project. Dr. Jessica Decuir-Gunby, thank you for getting straight to the point. Your mixed-methods course put all of the pieces together and helped me compose my research proposal.

Thank you to my master's thesis advisor, Dr. Delores Grant, of North Carolina Central University. You took me under your wing in 2011, and you've been by my side ever since. When I reached out needing advice during this time, you always provided it. Losing my mom at such a young age has been a struggle. During life's biggest challenges, the little girl inside the adult me

wants to call her mom for guidance, but I can't. You are like a second mom to me. I love and appreciate you, Dr. Grant.

Last but not least, thank you to my entire WTCC family. You all have supported me through this milestone, and I am so grateful to work within a department that encourages growth and innovation. Erin Doughney, you have always been Team Cocoa! When I call, you set aside time to listen. In my time of grief, you were there. Our venting sessions allow me to push forward. Dr. Jackie Swanik, Dr. Kimberly Fishback, and Dr. Scott Stauble, you've championed, believed, and trusted me to be a leader among leaders. Thank you to the Mathematics and Science Division for seeing what I might not always see in myself. You recently nominated me for the NC Community Colleges Excellence in Teaching Award, and I am so honored. Even if I am not the chosen recipient, this nomination speaks volumes and lets me know that you all are watching and that hard work can pay off. I am so thankful to work alongside a fantastic team of STEM educators.

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CHAPTER 1: INTRODUCTION

Less than 20 percent of the baccalaureate degrees produced across the U.S. are in STEM majors (NCES, 2019b). These majors include biological and biomedical sciences, computer and information sciences, engineering and engineering technologies, mathematics and statistics, chemistry, physics, astronomy, earth sciences, and science technologies (NCES, 2019b). Social sciences, health sciences, and STEM education are also considered STEM majors (Funk & Parker, 2018; National Science Foundation [NSF], 2017; NSF, 2020).

The lack of STEM degrees in the U.S. is concerning. Four-year STEM degree attainment plays a crucial role in propelling economic growth (Irons, 2009; OECD, 2020). Accordingly, the demand for STEM graduates has heightened because the technical and scientific capital STEM graduates possess is essential to meeting the needs of rising globalization and advanced technology (OECD, 2020). For example, compared to traditional farmers, modern farmers require more advanced knowledge and specialized skills to utilize new technologies necessary for present-day farming (e.g., technologies needed to produce and sustain genetically engineered crops or methods required to adapt to climate change).

In a world that depends on advanced technology, an insufficient number of students persisting in STEM fields may lead to economic instability (Becker, 1994; OECD, 2020). With economic downturn comes rising unemployment rates, lower wages, higher taxes due to increases in government spending, declines in the productivity and total income of the country (i.e., gross domestic product (GDP)), increases in inequality and poverty, and intensifying crime and unrest (Finklea, 2011; Irons, 2009; Pettinger, 2020). The U.S. has endured the devastating consequences of economic recessions before, for instance, the Great Recession's lasting effects between 2007 and 2009, so the urgency to reduce the likelihood of future recessions is

unambiguous. One way to prevent future economic instability in the U.S. and maintain global competitiveness is to increase baccalaureate STEM degree attainment (Irons, 2009; OECD, 2020).

Diversity in STEM Baccalaureate Degrees

An obvious target for improving four-year STEM degree outcomes is public community colleges (Hu & Ortagus, 2019; Jackson & Rudin, 2019). Community colleges enroll a significant percentage of the higher education student population, with a large proportion of those students being historically underserved (i.e., Black, Hispanic, and female students; American Association of Community Colleges [AACC], 2018). Relative to White students (60.3%), Hispanic (10.2%) and Black (6.5%) students account for a significantly smaller percentage of STEM baccalaureate degrees (United States Department of Education [USDE], 2017b). Similarly, compared to male students, female (36%) students are least represented among four-year STEM degree graduates (USDE, 2017b). Moreover, the representation of Black, Hispanic, and female students among STEM baccalaureate degree holders is not commensurate with the nation's demographics (United States Census Bureau [USCB], 2019; United States Department of Education [USDE], 2017b). While this differential may result from their interests in majors other than STEM, the historical context surrounding higher education in the U.S. suggests otherwise.

Historically, "higher education in the United States has been primarily available to a professional class that was White, able-bodied, heterosexual, Christian, and male" (Pliner & Johnson, 2004, p. 105). Policies, practices, and structures to sustain a homogenous population of educated White males still impact students of color and women in higher education and, more specifically, STEM degree programs. For instance, STEM faculty members at four-year institutions are less likely to be of color or identify as female (NCES, 2008). Furthermore,

textbooks used in STEM courses are commonly culturally- and gender-biased, and the pedagogical practices in specific STEM courses at particular institutions are often times non-inclusive (Blickenstaff, 2005; Grogan, 2018; Starobin & Laanan, 2008). Implicit bias and microaggressions contribute to the disparity observed among STEM bachelor's degree holders as students filter through the leaky STEM pipeline (Blickenstaff, 2005; Gayles & Awpaw, 2014; Grogan, 2018). These instances unintentionally perpetuate racism and gender discrimination, negatively affecting students of color and women in STEM.

Nonetheless, students of color and women experience positive outcomes at public community colleges (Hu & Ortagus, 2019; Malcolm, 2010; Starobin & Laanan, 2008; Wang, 2020). Besides the fact that community colleges are financially appealing (USDE, 2017d) and easier to access (AACC, 2017; Fain, 2013), diversity also plays a role in its attractiveness. The heterogeneous mixture of race and culture found at these institutions among the staff, faculty, and student populations essentially creates a safe place for marginalized groups (AACC, 2018; Bargh, 1997; Epstein, 2006; Gurin et al., 2002; Greenwald & Banaji; 1995; King & Kitchener, 1994; King & Shuford, 1996; Langer, 1978; NCES, 2008; Paiget, 1971; Stewart & LaVaque-Manty, 2009). Compared to four-year institutions, the percentage of Black and Hispanic faculty employed at public community colleges is higher (NCES, 2008). Furthermore, there is a much narrower gap between male and female faculty members at public community colleges than four-year institutions (NCES, 2008). Together, these characteristics give rise to a diverse environment that favors positive learning outcomes and promotes persistence among students of color and women (Hu & Ortagus, 2019; Jackson, 2013; Lovitts, 2001; Sax, 1994; Seymour and Hewitt, 1997; Starobin & Laanan, 2008; Strayhorn, 2019; Umbach, 2018; Wang, 2020).

Diversity in the STEM Workforce

The disproportionately small number of Black, Hispanic, and female STEM graduates across STEM fields creates an applicant pool that lacks diversity and, ultimately, contributes to the continued oppression of and discrimination against these groups within the STEM workforce (Funk & Parker, 2018). Black and Hispanic workers account for nine and seven percent of full-time STEM occupations in the U.S., respectively, while White workers make up most of the STEM workforce at 69 percent (Funk & Parker, 2018). Interestingly, women make up 50 percent of the STEM workforce. However, they are concentrated in mid-to lower-level healthcare occupations and least represented in male-dominated fields such as engineering, manufacturing, construction technology, aviation technology, and automotive technology (Funk & Parker, 2018; Gayles, 2014; Hagedorn & Purnamasari, 2012; Hyde et al., 2008). A STEM workforce that lacks racial and cultural heterogeneity also lacks innovation and diverse perspectives fundamental to reducing disparities and improving economic outcomes (Gurin et al., 2002; Moore & Continelli, 2016).

A STEM workforce with significant racial and gender gaps also indicates inequitable conditions (e.g., discrimination, sexual harassment, and wage gaps; Funk & Parker, 2018). In particular, compared to workers with non-STEM jobs, discrimination is higher for women and people of color working in STEM fields. For example, women who work in male-dominated STEM careers are more likely to endure sexual harassment and gender discrimination (i.e., earning less than men doing the same job; Funk & Parker, 2018). Similarly, people of color who work in predominantly White STEM fields experience higher levels of workplace discrimination (Funk & Parker, 2018).

Cross-race interactions and multicultural settings cultivate open-minded attitudes towards racial and cultural differences (Hurtado, 1998; Perry, 2013). Therefore, a shift in the racial and gender composition of the STEM workforce, as a result of increasing four-year STEM degrees for historically underserved groups, will likely address inequitable conditions and change the outdated social and gender norms that currently exist in male-dominated and less racially diverse STEM workplaces (Cohen, 2010; Decuir-Gunby, 2020; Hurtado, 1998; Ichheiser, 1970). Addressing inequitable conditions and outdated social and gender norms will bring awareness to the harmful impact these circumstances and behaviors have had on historically underserved groups and contribute to a safer and more inclusive STEM workforce. Additionally, this awareness will likely pour over into daily life activities and contribute to a more civil society (e.g., less crime, less discrimination, more equality; Hurtado, 1998; Perry, 2013). Increasing overall STEM baccalaureate degree attainment and degree completion for particular racial and gender groups is essential.

Adoption of CCB Policies

The benefits of improving baccalaureate degree outcomes of community college beginning students have presumably prompted state policymakers to create policies that target these two-year institutions. Some states have adopted policies that allow their public community colleges to confer four-year degrees. Traditionally, two-year institutions have offered up to the associate's degree, and four-year institutions have offered bachelor's degrees and beyond. State adoption of policies that permit community college baccalaureate (CCB) degree programs alters this structure.

Table 1.

CCB States and Year of CCB Approval.

State	Year of CCB Approval
West Virginia	1989
Utah	1992
Vermont	1993
Idaho	1995
New York	1996
Georgia	1997
Arkansas	1998
Nevada	1998
Florida	2001
Louisiana	2001
Minnesota	2003
Texas	2003
Hawaii	2004
Indiana	2004
New Mexico	2004
Oklahoma	2004
Washington	2005
North Dakota	2006
Colorado	2010
Wisconsin	2011
Michigan	2012
California	2014
Delaware	2015
Ohio	2018
Missouri	2018
South Carolina	2018
Oregon	2019
Wyoming	2019

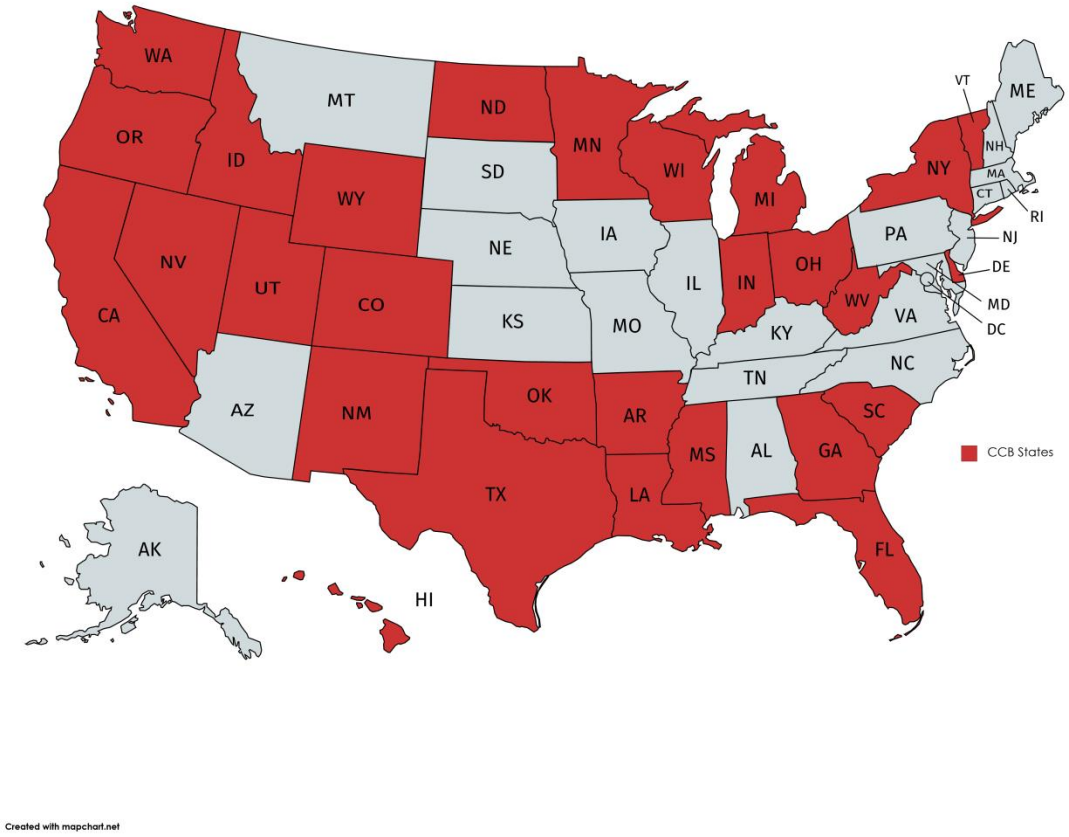
Note. This table presents the states authorizing CCB programs and the year of approval.

To date, 28 states have adopted CCB policies (refer to Table 1 for a list of CCB states). CCB policies aim to address the shortage of qualified workers in local labor markets by offering a more affordable and accessible pathway to a four-year degree (Fulton, 2020). Besides meeting the local labor market demands, some state CCB policies also acknowledge areas where there is high student demand, low program existence, or limited capacity at four-year institutions (Love & Palmer, 2020). The adoption of CCB policies could have a positive impact on STEM baccalaureate degree attainment. In addition, because these policies are specific to community colleges that serve a diverse population of students (AACC, 2018), it is reasonable to expect that these state policies could positively affect the racial and gender diversity of STEM graduates.

The first state to authorize CCB programs was West Virginia in 1989. Since then, 27 other states have approved CCB programs, with ten of those states adopting policies within the last ten years (see Figure 1 for a map of CCB states). Table 1 offers a chronological list of the years CCB approval in all 28 states was granted (Fulton, 2020; 2015; Laramie County Community College, 2019; Povich, 2018; Russell, 2010). Some states have adopted CCB programs to a greater extent than others, with the highest concentration of programs offered in Florida and Washington (Community College Baccalaureate Association [CCBA], 2020). In total, 109 public institutions are currently offering a mix of two-year and four-year degrees, as shown in Appendix A (CCBA, 2020; Fulton, 2020). Appendix B lists the CCB degree programs offered in Florida and Washington and reflects the type of degree programs available across the country (CCBA, 2020). While some four-year degrees are unique to community colleges (e.g., Bachelor of Applied Science degrees), other degrees are duplicates of those at four-year institutions, such as the Bachelor of Science in Nursing (BSN).

Figure 1.

Map of States Authorizing CCB Programs.



Note. This map shows CCB states in red. Retrieved from https://mapchart.net/

Arguments For and Against CCB

The advantages and disadvantages of CCB policies have been debated extensively in the literature (Daugherty et al., 2014; Farnsworth, 2006; Floyd, 2006; Floyd & Arnauld, 2007; Floyd, Floyd, Skolnik, & Walker, 2005; Floyd & Walker, 2008; Fulton, 2015; Hanson, 2009; Hrabak, 2008; Hrabak, & Falconetti, 2008; Levin, 2004; Mckinney & Moore, 2010; Petrosian, 2013; Russell, 2010; Skolnik, 2008; Stubenrauch, 2016; Townsend, 2005; Walker, 2005; Walker, 2006). Although they do not provide empirical evidence, these arguments offer ideas about how CCB programs can influence four-year degree production. Proponents of CCB programs make three main arguments. The first argument is that baccalaureate programs at community colleges provide a more accessible bachelor's degree route than four-year institutions, and this is because open access is an essential part of the community college mission. In particular, admission denials are typical for students who fail to meet the four-year institution's qualifications (e.g., low grades and test scores; Bemmel et al., 2008). The open-door policy at community colleges eases the admissions process and increases access by only requiring students to show proof of a high school diploma or general equivalency diploma (GED; AACC, 2017). Furthermore, community colleges' location contributes to their convenience, especially for place-bound students or students living in education deserts. Education deserts are areas with no four-year colleges or universities, and only a community college exists (American Council on Education [ACE], 2016; Hillman, 2016).

The second argument made by CCB-advocates is that the lower tuition and fees at community colleges provide a more affordable pathway to the four-year degree (Jacobs & Dougherty, 2006; Manias, 2007; Meyer, 2006; Russell, 2010; Walker, 2005). The average annual undergraduate tuition for first-time, full-time students at community colleges is approximately

$5000 less than public four-year institutions (USDE, 2017d). The third argument is that CCB programs are suitable for state and local economic development. Since CCB programs essentially reduce the costs (e.g., price, travel requirement, and racial biases) associated with completing the four-year STEM degree, students are more likely to enroll in college (Manias, 2007) and persist to bachelor's degree completion. Consequently, credentialed STEM workers will be available to the labor market (Cominole, 2017), and improvements in state economic conditions are likely (Ma et al., 2016a).

Those who oppose CCB adoption rely on two main arguments. The first argument is that four-year degrees offered at the community college are of lesser value or quality than the university's degrees (Wattenbarger, 2000). Recent reports negate this argument showing that community college graduates are not less likely to be employed than their four-year counterparts (Chen, 2019; Cominole, 2017). The second argument is that CCB-adoption will lead to mission creep (Townsend, 2005). In this context, mission creep refers to the gradual shift of public community colleges' traditional mission to resemble four-year institutions' mission (Fain, 2013). The current mission of the community college is multi-layered. One layer of the mission is to prepare students for senior institutions (i.e., four-year institutions). A second layer is to prepare students for immediate entry into the labor market (i.e., vocational education). A third layer provides continuing education for adult students who want to enhance or update their knowledge. Lastly, a fourth layer ensures education for all (i.e., all cultural backgrounds and academic preparedness) through developmental education curricula (Fain, 2013). Opponents fear that CCB policy adoption and expansion will shift community colleges' focus away from its open-access mission to that of selective four-year institutions. This institutional isomorphism, or emulation, could lead to unintended consequences such as tuition increases, program duplications, and

institutional competition for students (Fulton, 2015; Kramer et al., 2020; Ortagus & Hu, 2019, 2020). However, opponents overlook the fact that by offering CCB degree programs, community colleges are still adhering to their mission to prepare students for the local labor market and fill workforce gaps in applied, technical, and occupational fields (Ignash & Koton, 2005; Kramer et al., 2020). Furthermore, recent research demonstrates that CCB-adoption is associated with increased associate degree production (Ortagus et al., 2020).

Problem Statement

State adoption of CCB policies may increase STEM graduates by providing a more affordable, accessible, and inclusive pathway to the four-year STEM degree. Alternatively, CCB policies may attract students from more selective or relatively more expensive traditional four-year institutions and have no impact on state-level degree production (Kramer, 2020). The literature lacks a clear picture of whether CCB programs impact the overall number of STEM baccalaureate degrees and whether these programs affect the number and share of minority students and women earning a four-year STEM degree.

Brief Overview of the Research

This dissertation expands on the work of Daun-Barnett (2011), Daun-Barnett (2014), Park et al. (2018), and Porter et al. (2014). Analyses conducted by these researchers examine the degree outcomes of CCB programs (Daun-Barnett, 2011; Daun-Barnett, 2014; Park et al., 2018; Porter et al., 2014), but present inconsistent results. These studies employ difference-in-differences (DiD) and fixed-effects models to determine the impact of CCB policies on state-level nursing (Daun-Barnett, 2011; Daun-Barnett, 2014; Porter et al., 2014) and teacher education degree production (Daun-Barnett, 2014; Park et al., 2018). These groups focus on nursing and teacher education degree outcomes because they are common at CCB institutions

found across the U.S. The labor market also reflects that nursing and teacher education graduates are in high demand (Garcia & Weiss, 2019; Nightingale College, 2020). The impact of CCB nursing and teacher education programs are relevant to this dissertation since nursing, a health science, and STEM education, specifically, are considered STEM majors.

Three studies focus on CCB nursing degree production; however, these studies present conflicting results (Duan-Barnett, 2011; Daun-Barnett, 2014; Porter et al., 2014). Daun-Barnett (2011) reported a positive relationship between CCB authorization and state-level nursing degree production for all public and private institutions. Conversely, Daun-Barnett (2014) and Porter et al. (2014) found CCB authorization to have no discernible effect on state-level nursing degree production. Duan-Barnett (2014) also investigated the racial composition among baccalaureate degrees produced since community colleges serve a diverse student population. Duan-Barnett (2014) found negative outcomes for Black students and positive effects for Hispanic students. However, Duan-Barnett (2014) found that these results were not associated with CCB authorization.

Regarding the effects of CCB authorization on state-level teacher education degree production, two studies exist with mixed results (Daun-Barnett, 2014; Park et al., 2018). Park et al. (2018) found no effects on teacher education degree production across the country but saw an increase in Florida. On the other hand, Daun-Barnett (2014) found negative results in Florida. The Park et al. (2018) study also looked at the racial composition of the state-level teacher education degrees awarded. Park et al. (2018) found decreased production for Black and Hispanic students in Florida and no effects across the U.S. (Park et al., 2018).

Limitations of Current Research

The research mentioned above is limited in several ways (Daun-Barnett, 2011; Daun-Barnett, 2014; Park et al., 2018; Porter et al., 2014). First, as fixed-effect and DiD estimates are sensitive to sample size and time, the current findings may not represent the actual effects of CCB authorization. The previous researchers used data taken between the years of 2000 and 2008 (Daun-Barnett, 2011), 2001 and 2009 (Duan-Barnett, 2014), 1997 and 2011(Porter et al., 2014), and 1995 to 2013 (Park et al., 2018). Perhaps, these timeframes are not long enough to show statistically significant results. The amount of time passed from CCB approval in the existing studies does not allow for the proliferation of or attractiveness (i.e., enrollment increases) to CCB programs to impact graduation numbers. Florida's timeline shows that CCB implementation can happen within the same year as CCB policy authorization (Kramer et al., 2020). While CCB implementation can occur during the same year as CCB authorization, a minimum of four years is typically needed to produce graduates. Moreover, the average student takes about six years to complete a bachelor's degree (Stewart, 2020). It is also possible that students finishing the associate's degree in the same year as CCB implementation continued into a CCB degree program, which would require a minimum of two more years. Data gathered between 1997 and 2011 reveals 1,137 CCB nursing graduates across the U.S. Between 1995 and 2013, there were 3,724 teacher education graduates in Florida (raw data from IPEDS, 2020). These numbers demonstrate a relatively small number of programs. As time accrues and the number of CCB programs increases, the validity of the studies examining the effects of CCB policies should improve. As of 2019, over 14,000 nurses and 13,700 teachers (1,684 STEM education) are graduating from 109 institutions that confer both two-year and four-year degrees

across the U.S. (raw data from IPEDS, 2020). This dissertation takes advantage of these proliferations.

Another limitation to consider is the existing shortages in nursing and teacher labor markets. The number of nurses and qualified K-12 teachers over time has reflected declining trends. Therefore, states have to compensate for negative trends before they begin to see positive trends. To appropriately interpret this dissertation's outcomes, I also needed to consider such downward trends in the STEM workforce.

Lastly, nursing and science education programs are two options among several other STEM majors. Yet, no studies have investigated the effects of CCB policies on overall four-year STEM degree production. The literature also lacks investigations on the impact of students of color pursuing CCB STEM degrees other than nursing, and women have been excluded from the conversation altogether. While Daun-Barnett (2014) and Park et al. (2018) investigated teacher education program outcomes, the studies did not specifically examine STEM teacher education programs, rendering the impact of CCB policies on the number of STEM education graduates indistinguishable from all teacher education graduates. This study aims to investigate the outcomes of CCB authorization on overall state-level STEM degree production and the number of Black, Hispanic, and female STEM graduates by answering the following research questions.

Research Questions

1. To what extent has CCB-implementation affected state-level STEM baccalaureate degree production?
2. To what extent has CCB-implementation affected state-level STEM baccalaureate degree production for Black and Hispanic students?

3. To what extent has CCB-implementation affected state-level STEM baccalaureate degree production for women?

Brief Overview of the Methods

I employed a difference-in-differences (DiD) design to answer these research questions. This quasi-experimental design uses panel or longitudinal data gathered before and after treatment to determine an intervention's causal effects. To compose a nationally representative dataset, I extracted data from the Integrated Postsecondary Education Data System (IPEDS) for all degree-granting two-year and four-year public and private institutions across the U.S.

The DiD design estimates the effect of a population's treatment by comparing changes in the treatment and control groups' mean outcomes over time. This study compared differences in state-level STEM baccalaureate degree attainment before and after the first class of CCB STEM graduates. The treatment group included states with a CCB policy, CCB STEM program, and CCB STEM graduates (CCB states). I classified states that did not possess these characteristics as controls (non-CCB states). Comparing changes in the mean outcomes over time between the treatment and control groups allows the DiD design to remove secular trends or various factors that might cause endogeneity issues. In other words, the design controls for differences between the two groups, other than the treatment, that could contribute to an estimated effect that is biased. This setup lessens the need to include numerous control variables. However, I added state and year fixed-effects and covariates to the models to further reduce the risk of biasing the treatment effect (Furquim et al., 2020).

Brief Introduction to the Conceptual Framework

STEM baccalaureate degree attainment in the U.S. is relatively low (National Center for Education Statistics [NCES], 2019). This gap has had a downstream effect on the STEM

workforce. Technical and scientific skills are essential to economic strength and competitiveness. Therefore, the value of community colleges in producing graduates with technical skills is recognized. Accordingly, state policymakers in 28 states have enacted policies that allow public community colleges to confer four-year degrees. These policies essentially create a route to a four-year degree, which is relatively inexpensive and available to a broader group of students.

Human capital theory explains the potential relationship between CCB programs and STEM baccalaureate degree attainment. According to human capital theory, students invest in higher education if the costs do not outweigh the investment return (Becker, 1994). CCB programs lower the direct and indirect costs of achieving a four-year degree. Direct costs are the monetary expenditures a student and his/her/their family incur while attending college (Toutkoushian & Paulsen, 2016). Indirect costs include non-monetary investments such as time spent attending college instead of embarking on other non-educational opportunities (Toutkoushian & Paulsen, 2016). The benefits of completing a baccalaureate degree include increasing one's knowledge, honing skills, and moving up the socioeconomic ladder. Given a pathway that reduces higher education costs and potentially offers a significant return on investment, students, specifically STEM students, should be encouraged to persist to four-year degree completion, triggering a proliferation of STEM graduates.

Historically underserved groups incur additional indirect costs associated with obtaining the four-year STEM degree due to the historical context of exclusion and oppression surrounding higher education and particular STEM fields (Blickenstaff, 2005; Gayles & Awpaw, 2014; Grogan, 2018; Pliner & Johnson, 2004). However, community colleges lower these costs by providing a more inviting multicultural environment that is attractive and comforting to these

groups. Given the multicultural population of students found at community colleges, diversity among four-year STEM graduates could improve.

Not only do CCB policies decrease costs and increase benefits for students, but they work in favor of the state. State and local policymakers seek to maintain state conditions that are conducive to a stable economy (The White House, 2020). State policies such as the authorization of CCB programs may aid in achieving these goals. Research demonstrates that individuals who have obtained a baccalaureate degree or higher have a beneficial influence on the economy relative to non-degree holders, such as having greater job security (Ma et al. 2016b). Furthermore, a racial and gender composition that reflects the demographics of this country could also lead to beneficial outcomes (USCB, 2019; USDE, 2017b). In particular, a diverse pool of STEM graduates will ultimately gain access to the STEM workforce creating heterogeneous environments that will potentially promote inclusivity and lessen workplace discrimination (Hurtado, 1998).

Summary

This study fills a gap in the literature about the effect of CCB programs on four-year STEM degree attainment. While I found little evidence to suggest that CCB programs are effective, the outcomes of this study indicate that more work is necessary to understand the potential of CCB programs. In the following chapter, I include a synthesis of the literature relevant to this dissertation and a detailed explanation of the theory used to frame this work. Subsequently, in chapter three, I describe the research design, the study variables, and the analytical approach. After that, in chapters four and five, I detail the results, discuss alternative explanations, offer policymakers recommendations, express future research directions, and describe the limitations of this study.

CHAPTER 2: LITERATURE REVIEW

Almost 30 states across the U.S. have adopted policies that allow their community colleges to confer four-year degrees. Many community college baccalaureate (CCB) degree programs lead to a four-year STEM degree. Uncovering the extent to which CCB STEM programs affect state-level STEM baccalaureate graduates is the goal of this research. In this literature review, I begin by detailing the conceptual framework used to explain the expected relationships between CCB implementation and four-year STEM degree production. Then, I provide relevant context about the community college and CCB programs. Lastly, I outline the existing research on the degree outcomes associated with CCB programs and discuss how this study builds on previous researchers' work.

Conceptual Framework

With low four-year STEM degree attainment (NCES, 2019) and overwhelming shortages in the U.S. STEM labor force (Funk & Parker, 2018; Hagedorn & Purnamasari, 2012), state policies encouraging students to pursue four-year STEM degrees are vital. A significant number of students begin their higher education careers at public community colleges. Community-college beginning students are the least represented among four-year STEM graduates (Wang, 2020). State policies that work in favor of community college students could bring about improved STEM degree outcomes. Conceptually, human capital theory can explain why state policies that target community colleges can potentially achieve better STEM baccalaureate degree outcomes.

Human capital theory suggests students invest in higher education to increase their intellect, aptitude, and marketability (Becker, 1994). Capital is anything that yields income or other types of output over time (Becker, 1994). Capital that adds to an individual's intangible

assets, elevates their worth, and improves their livelihood is human capital (Becker, 1994). Therefore, educational attainment is human capital. Higher education yields advanced knowledge, specialized skills, economic mobility, better health outcomes, and other outputs that make an individual more productive over their lifetime.

There are expenditures associated with attaining higher education, however. These expenditures include direct costs such as tuition and fees, monies associated with purchasing books, funds needed for travel, and indirect costs such as time investments, delays in labor market entry, forgone income, and sacrificed opportunities unrelated to education (Becker, 1994; Toutkoushian & Paulsen, 2016). The benefits of attaining higher education are great; however, the price of higher education can sometimes be a deterrent that discourages students from attending or completing college.

How Costs & Benefits Affect College Enrollment

History confirms that higher education enrollment increases when there are tremendous benefits but declines when the advantages are lessened (Chen, 2019b; Gehring, 2013, Smith, 2018). For example, college enrollment patterns juxtaposed to unemployment patterns show that as unemployment rates increase, so does college enrollment (Smith, 2018). The synchronized rise in college enrollment and unemployment numbers recorded during The Great Recession between 2007 and 2009 offers a perfect example. During the Great Recession, unemployment rates were at an all-time high. The inability to secure a job encouraged people to pursue postsecondary degrees that would qualify them for future job openings (Chen, 2019b; Gehring, 2013).

Another example is the historical experience of women. Up until 1975, women lagged behind men in college enrollment (Hagedorn & Purnamasari, 2012). Political, economic, social,

and gender norms limited women to marriage and taking care of the household making higher education less beneficial (Becker, 1994). Nonetheless, with the women's rights movements of the 1960s and 1970s, the introduction of the Civil Rights Act, and the enactment of the Higher Education Amendments of 1972, job opportunities for women increased, thereby making college attainment more beneficial (Becker, 1994). These examples demonstrate that if the benefits reaped from obtaining a postsecondary degree are more substantial than the degree's costs, students will pursue and persist in higher education.

How Community Colleges Reduce Costs

Community colleges represent a pathway to educational attainment that is available at a lower cost to students. The community college system in the United States comprises approximately 1,462 public and private schools that enroll 36 percent of all undergraduate students (5.9 million) in higher education (NCES, 2019; USDE, 2017). Of those 5.9 million students, 5.8 million attend a public community college (NCES; 2019). The public sector represents about 72 percent (1,047) of the community college system, and the private sector, about 28 percent (USDE, 2017). Public community colleges possess characteristics that reduce the costs associated with postsecondary degree attainment. Compared to their four-year counterparts, public community colleges are more affordable, more accessible, and more diverse (AACC, 2018; Bemmel et al., 2008; Fain, 2013; Ma et al., 2018; USDE, 2017d).

Affordability

Even though they are underfunded, public community colleges are more cost-effective than four-year institutions (USDE, 2017d). Federal, state, and local appropriations make public community colleges more economical (Ma et al., 2018). On average, public community colleges carry a sticker price of approximately $5000 less per year than four-year institutions' sticker

price (USDE, 2017d). The lower tuition and fees at public community colleges are attractive to community college beginning students, especially low-income or loan-averse students. Almost 70 percent of all students (dependent and independent) enrolled at a public community college have a family income of less than $50,000. More than half of those students come from a household earning less than $20,000. Among dependent students alone, 55 percent have a family income < $30,000 (Community College Research Center [CCRC], 2020). While 46 percent of first-time, full-time degree/certificate-seeking undergraduate students at four-year public institutions take out loans, only 19% acquire loans at public community colleges (NCES, 2020).

The more affordable price tag found at public community colleges is vital to the students they serve. Attending a public community college seemingly "makes the transition to college logistically, financially, and emotionally easier" (Turley, 2009, p. 138). In other words, attending a public community college significantly reduces the costs (e.g., tuition, travel expenses, distance from family or support systems) associated with pursuing a four-year degree, which, in turn, increases the likelihood of a student completing the degree (Ali & Saunders, 2009; Baum & Flores, 2011; Briscoe & De Oliver, 2006; Byun et al., 2012; De Oliver, 1998; Dillon & Smith, 2013; Hillman, 2016; Hurtado et al., 1997; Jabbar, 2017; McDonough et al., 1997; Ovink & Kalogrides, 2015; Perna, 2010; Perez & McDonough, 2008).

Accessibility

Public community colleges are more accessible than four-year institutions. Open access is an essential part of the public community college mission as providing access to individuals from all cultural and academic backgrounds is a core component (Fain, 2013). Unlike the public community college, public four-year institutions are selective, some more selective than others, requiring students to meet certain criteria (e.g., specific grade point averages and specific SAT

scores; Bemmel et al., 2008). The open-door policy at public community colleges essentially eases the admissions process relative to selective four-year institutions, only requiring students to show proof of a high school or general equivalency diploma (GED; AACC, 2017). Public community colleges meet students where they are academically and provide resources to make improvements where needed. For example, the offering of placement tests to determine students' academic abilities (Gabbard & Mupinga, 2013) and developmental education courses in math, reading, and writing available to students who are determined academically underprepared by those placement tests. Developmental education courses are in place to improve a student's readiness for college-level coursework (Jaggars et al., 2015). These courses equip community colleges with the ability to catapult academically underprepared students to degree completion.

Public community colleges are also more geographically convenient than their four-year counterparts. While the world has become more mobile than ever, access to transportation and mobility are associated with higher socioeconomic status (SES) and whiteness (Hillman, 2016; B. Long, 2004). In many cases, students are limited to their geography of opportunity (Turley, 2009). Geography of college opportunity refers to the higher education options available to members living within a community. Not all communities have equal proximity to four-year colleges and universities, with minority communities enduring the most impact (Hillman, 2016). Community colleges are often the only public institution of higher education nearby. Students who are place-bound or live in education deserts also rely on public community colleges for their educational needs (ACE, 2016; Rouse, 2015). The dissemination of community colleges across the U.S. makes it easier for underserved students to attain a postsecondary education.

Diversity

While public community colleges still have work to do, they have the most diverse student population compared to other U.S. higher education institutions (AACC, 2018). Public community colleges serve a large proportion of the postsecondary student population ranging in age, life experience, SES, and academic preparedness. According to *Fast Facts 2018,* produced by the AACC, community colleges are approximately 24 percent Hispanic, 13 percent Black, six percent Asian/Pacific Islander, three percent two or more races, two percent non-resident alien, and one percent Native American (AACC, 2018). Furthermore, 36 percent of students are first-generation, 17 percent are single parents, 12 percent are students with disabilities, seven percent have already obtained a baccalaureate degree, and four percent are military veterans (AACC, 2018). In addition, the median age of students found in community colleges is 29, with the majority of the students falling between the ages of 18 and 24 (College Board; AACC, 2017).

The racial and gender diversity among students enrolled at community colleges plays a vital role in historically underserved students' learning and developmental outcomes. Research demonstrates that minority students learn better when exposed to multiculturalism or racial diversity in the classroom (Bargh, 1997; Greenwald & Banaji; 1995; Gurin et al., 2002; King & Kitchener, 1994; King & Shuford, 1996; Langer, 1978; Paiget, 1971). Research also suggests that a large concentration of historically underserved students (i.e., critical mass) in a classroom aids in the elimination of negative stereotypes (e.g., minority students are less capable of academic success). Stereotypical criticism often impedes minoritized groups' learning and cognitive growth (Epstein, 2006; Stewart & LaVaque-Manty, 2009). Conversely, this is not the case for males in a predominantly female environment nor White women in an environment concentrated with women of color. Data show that their performances are not affected by these

environments (Stewart & LaVaque-Manty, 2009). For perspective, women and other historically marginalized groups tend to overlook or drop out of science and engineering programs due to environments that lack representation and promote implicit bias (Blickenstaff, 2005; Gayles & Awpaw, 2014; Grogan, 2018; Stewart & LaVaque-Manty, 2009). This consequence is especially true for women of color. As women and individuals of color, women of color are affected by lack of representation and implicit bias in double measure compared to men of color or White women (Harris, 2020; Stewart & LaVaque-Manty, 2009). Women of color are the least represented in science and engineering programs (White House Initiative on Educational Excellence for African Americans, 2016). This study does not examine the degree outcomes for Black women specifically, but this narrative helps to solidify a reality for underrepresented students. The grouping of historically underserved students essentially creates a safe place for minoritized students and contributes to a sense of belonging and feelings of self-confidence, which are fundamental to student learning and development (Jackson, 2013; Lovitts, 2001; Sax, 1994; Seymour and Hewitt, 1997; Starobin & Laanan, 2008; Strayhorn, 2019; Umbach, 2018; Wang, 2020).

Research on K-12 and higher education classrooms support the notion that minority students perform better in courses taught by minority instructors (Bargh, 1997; Egalite, 2015; Fairlie, 2014; Greenwald & Banaji, 1995; Gurin et al., 2002; King & Kitchener, 1994; King & Shuford, 1996; Langer, 1978; Paiget, 1971; Umbach, 2006). Faculty of color interact more with students and utilize a greater variety of pedagogical practices than their White colleagues (Umbach, 2006). Moreover, female faculty members' four-year STEM courses provide evidence that the gender of faculty members matters in closing gender gaps in STEM (Solanki & Xu, 2018). Cross-cultural perspectives of faculty or a staff's ability to effectively communicate with

students of different cultures are critical (Contreras, 1990). Cultural awareness promotes multicultural education (Banks, 1993) and culturally responsive teaching (Ladson-Billings, 1994). Relative to four-year institutions, public community colleges have a greater concentration of Black and Hispanic faculty (NCES, 2008). Additionally, public community colleges bear a narrower gap between male and female faculty (NCES, 2008).

While the structural diversity or the number of racially diverse students and faculty members present at public community colleges does not guarantee intergroup interactions or the eradication of implicit bias, this diversity puts these two-year institutions in a position to offer a truly multicultural education. Theoretically, multicultural education is an educational experience that is equitable and culturally empowering for students from diverse racial, ethnic, and social-class groups (Banks, 1993; Banks, 2008). Multicultural education provides both male and female students an equal opportunity for educational success and social mobility. Furthermore, a multicultural education teaches students to be more egalitarian in their approach to ethnic differences (Banks, 1993). Gustav Ichheiser, a social psychologist, suggests that prejudice arises when individuals are oblivious to differences (Cohen, 2010):

> [W]e fail to understand that people whose personalities are shaped by another culture are psychologically different -- that they see the (social) world in a different way and react to it as they see it. Instead, we tend to resolve our perplexity arising out of the experience that other people see the world differently than we see it ourselves by declaring that those others, in consequence of some basic intellectual and moral defect, are unable to see things ‘as they really are’ and to react to them ‘in a normal way’…The prejudiced are not those who insist that people are different…but those who deny it.” (Ichheiser, 1970, pp. 70-72)

Individuals who are highly colorblind fail to see differences between races (Cohen, 2010; Decuir-Gunby, 2020). However, individuals low in colorblindness realize that different races perceive and experience the world differently (Cohen, 2010). Public community colleges offer an environment that cultivates low colorblindness. The diversity (i.e., racial, cultural, academic, age, and experience) at public community colleges contributes to its inclusive and nurturing environment. This environment helps students, specifically STEM students, pay less attention to their differences and more attention to their studies (Staroban & Laanan, 2008).

While challenges for community college-beginning students have surfaced in past research (Long & Kurlaender, 2009), recent studies present promising results. For instance, underrepresented students of color feel a sense of belonging at the community college (Wang, 2020). Hispanic students express greater motivation to complete a four-year STEM degree (Malcolm, 2010). Female students experience a more positive learning experience, and they are also more likely to choose a STEM major due to the ample support, encouragement, and reinforcement available at community colleges ((Lovitts, 2001; Sax, 1994; Seymour & Hewitt, 1997; Starobin & Laanan, 2008). Furthermore, recent research shows that women are not less likely to persist toward the four-year STEM degree when beginning at the community college (Hu & Ortagus, 2019). All in all, four-year degree programs offered at public community colleges provide an opportunity for a substantial subset of the higher education student population to attend where they feel embraced, supported, and inspired to complete the baccalaureate degree.

Transfer Pathways

Before the authorization of CCB programs, students attending community colleges could choose to take individual courses for intellectual exploration, obtain a certificate, or pursue an

associate's degree. Community colleges have traditionally partnered with state or local universities to allow community college-beginning students to complete the baccalaureate degree since only four-year institutions could confer bachelor's degrees (Floyd & Walker, 2008). These baccalaureate partnership models allow community college-beginning students to transfer credits from the community college to the four-year institution. These transfer credits apply to the credits needed to satisfy the requirements of the bachelor's degree. Statewide articulation agreements exist to outline the guidelines for transferring credits from two-year to four-year institutions (Barrington, 2020).

The percentage of students who persist toward baccalaureate degree attainment after transferring to four-year institutions underscores the benefits of the more affordable, more accessible, and more diverse nature of public community colleges. Upwards of 80 percent of students beginning at the community college indicate their desires to earn a four-year degree; however, only a small percentage transfer and an even smaller percentage complete the degree (CCRC, 2020). Of all students who started at a community college in 2013, only about 16.7 percent completed a degree at a four-year institution within six years (CCRC, 2020). Completion for White, Hispanic, and Black students was 21.6 percent, 13.8 percent, and 9.9 percent, respectively. Furthermore, Hispanic (37.2%) and Black (28.4%) students are less likely to transfer than White students (47.7%; Shapiro, 2018). CCB programs provide an alternate route to the bachelor's degree.

Transfer pathways seemingly pose challenges, especially for community college-beginning STEM students (Wang, 2020). Lateral transfer students (i.e., students transferring from one university to another) are not as impacted by the transfer process. This case suggests that normative differences between four-year and two-year institutions negatively impact students

who attend a community college first (Hill, 1965; Elliott & Lakin, 2021). Compared to lateral transfer students, vertical transfer students experience more cultural, social, and academic challenges post-transfer (Elliott & Lakin, 2021). The campus culture of community colleges compared to their senior institutions differs. Community colleges are typically commuter schools which differs from the residential nature of public four-year institutions. The student population at community colleges generally is more generationally, academically, and racially diverse than the transfer-receiving institution, which is advantageous for the community college-goer. This diverse exposure contributes to cultural competence that students may not gain at more selective institutions. At the community college, students can seek help directly from faculty or receive guidance on where to access tutoring or additional assistance with assignments. These opportunities may be less likely at the four-year institution where there are "limited office hours, larger class size, and perceptions of unavailable faculty" (Elliott & Lakin, 2021, p. 810). Rendon's (1994) validation theory focuses on nontraditional and underserved students and states that validation is the most critical factor for their success and persistence. Validation is defined as an "enabling, confirming and supportive process initiated by in- and out-of-class agents that foster academic and interpersonal development" (Rendon, 1994, p. 44). Students who are validated exude confidence and an ability to learn, whereas invalidation initiates the opposite. Active intervention from faculty and other institutional agents that occur early is vital to student success. '[W]hen external agents [take] the initiative to validate students, academically and/or interpersonally; students [begin] to believe they [can] be successful (Rendon, 1994, p.40).

Socially, community college-transfer students may have difficulties fitting in or developing new friends (Ellis, 2012). While attending the community college, these students most likely return home to their communities and families and have less need to build new relationships or

acquire new peer networks. Tinto's (1993) theory of persistence links a student's decision to leave college to their social integration and active involvement in college, or a lack thereof.

Community college-beginning students are more likely to experience transfer shock, with STEM students being the most impacted (Cejda et al., 1998; Lakin & Elliott, 2016). Transfer shock is a decline in student performance resulting from a shift in academic expectations between institutions (Lakin & Elliott, 2016). Community college-transfer students go into the four-year classroom expecting an experience similar to the one offered at the community college. Yet, the academic norms of the two-year institution may not be practical at the four-year institution. Community colleges offer smaller class sizes, differentiated classroom instruction, and more faculty-student interaction. The average class size at the community college ranges from 25-35 students compared to 300+ at some four-year institutions (Wayne County Community College District, 2020). With smaller classes, faculty at two-year institutions can be more flexible in their course delivery (Tuthill & Berestecky, 2017), which plays a significant role in student retention and persistence (Umbach & Wawrzynski, 2005). When faculty employ more engaging techniques in the classroom setting, such as active and collaborative learning, students are more engaged, enhancing student success (Umbach & Wawrzynski, 2005).

Community college-beginning STEM students also face credit-transfer challenges that could delay their time to degree completion (Xueli Wang, 2020). These instances contribute to the smaller percentage of STEM students who transfer to the senior institution or fail to persist to degree completion post-transfer. In an interview conducted by Xueli Wang (2020), a transfer-intending STEM student revealed that "none of the credits she had taken in the information technology (I.T.) program transferred to any of the public universities in the state…and 'the only schools that really have something are the very expensive private schools'" (Wang, 2020, p. 47).

This statement highlights the challenges of transfer pathways for community college-beginning students, specifically STEM students. Credits for STEM courses do not always transfer to the public four-year institution (Lyon & Denner, 2016). When credits do not transfer to the senior institution, students end up paying additional tuition and fees to take acceptable STEM courses and endure extended time to degree completion (Lyon & Denner, 2016). Some institutions only offer STEM courses during the fall semester or the spring semester, but not both. The STEM curriculum is highly linear; therefore, students must adhere to a rigorous schedule. The inability to register for a required STEM course, perhaps due to course capacity limits, could derail STEM students by a year or more and forces students to take additional unrequired classes if they need to maintain financial aid. A student must be enrolled at least part-time to secure financial assistance. This scenario affects the time to degree completion, delays entry into the labor market, and ultimately costs more financially. Many of the students enrolled at community colleges often come from challenging backgrounds (i.e., less educated and low-income families), are possibly taking care of loved ones, working full-time, and juggling other issues simultaneously. Conforming and shifting their schedules to meet the STEM transfer curriculum's specific demands makes it difficult for them to persist in STEM degree programs. Accordingly, community college-beginning students are 53.5 percent less likely to complete a STEM degree than their four-year beginning counterparts (Hu & Ortagus, 2019). The opportunity to earn a four-year STEM degree at the community college could increase STEM degree completion by providing an alternative to the transfer track.

How Students Analyze Costs & Benefits

Many community college-beginning students come from challenged backgrounds and are least represented among four-year STEM degree graduates (Hu & Ortagus, 2019). While human

capital theory implies that students are rational decision-makers, Becker (1994) recognizes that a student's ability to conduct an adequate cost-benefit analysis depends on other factors, such as an individual's family background and geographical location. Family background offers a student a certain level of privilege. A student's level of privilege, determined by a combination of race, gender, parental education, and SES (National Association of School Psychologists, 2016), plays a crucial role in how an individual perceives the costs and benefits of degree attainment (Becker, 1994). As an illustration, well-educated and high-income households understand the significance of pursuing postsecondary education and can afford to invest in better preparation ahead of college entry. Unlike a student from a less educated and low-income family, a student from a well-educated high-income family will essentially have more starting capital going into higher education. The higher level of preparedness allows a student of greater privilege to make more informed decisions about college (i.e., institution type, tuition, distance) and matriculate college at a steadier pace.

On the other hand, lesser privileged households may lack the knowledge and understanding to encourage their student to apply to, invest in, and persist through college. Lower preparedness levels lessen a student's ability to make informed decisions about higher education costs and benefits. This differential contributes to undermatching (Saltiel, 2020) and disparities in college enrollment and degree completion. By offering four-year degree programs at community colleges, many students will have the opportunity to complete a four-year degree regardless of their family background and geographical location.

How States Benefit from CCB Policies

The advantageous outcomes of CCB policies are not one-sided as state policymakers also benefit from CCB policies. State (and local) policymakers are responsible for the citizens'

overall health, wealth, and well-being they govern. Therefore, they are obligated to put structures in place to keep unemployment rates down, bolster an economy that sustains higher wages, reduce state taxes and state spending, decrease inequality and poverty, and lessen crime and unrest (The White House, 2020). Research demonstrates that individuals who have obtained a baccalaureate degree or higher are more likely to be employed, have higher incomes, and have health insurance (Ma et al. 2016b). Additionally, they are less likely to live in poverty and receive public assistance (Ma et al., 2016b). These outcomes lower costs for states. Therefore, increasing the number of STEM baccalaureate degrees in a state improves that state's societal and economic conditions and fulfills state and local policymakers' obligations.

Increasing diversity among STEM graduates also works in the state government's favor. A diverse pool of qualified STEM workers is needed to serve the pluralistic society that has evolved in the U.S. For example, cultural competence is fundamental in healthcare to reduce health disparities (Moore & Continelli, 2016). Diversification is a "compelling government interest" and has been shown to have positive long-term effects on individual students and to remedy the existing impact of historical discrimination (Civil Rights Project, 2010; Fisher v. The University of Texas, 2016; Gratz v. Bollinger, 2003; Grutter v. Bollinger, 2003; Hopwood v. Texas, 1996; Regents of the University of California v. Bakke, 1978; Jaschik, 2019a; Jaschik, 2019b). Exposing individuals to a diverse school and college setting early on in life encourages those individuals to accept diversity in other educational, occupational, and social settings as adults (Hurtado, 1998). This concept suggests that a racially and culturally heterogeneous group of STEM graduates will create diverse work environments that cultivate inclusivity and reduce discrimination (Cohen, 2010; Decuir-Gunby, 2020; Hurtado, 1998; Ichheiser, 1970), which bolsters workplace collaboration and productivity.

Community Colleges and CCB Programs

To date, 28 U.S. states have adopted policies that authorize public community colleges to offer baccalaureate degree programs. Each state policy specifies the rationale for developing and implementing CCB programs. All state policies specify that CCB programs intend to increase baccalaureate degree attainment. While in some states, labor market demand is the only driving force behind a CCB policy, in other states, high student demand, low program existence, or limited capacity at four-year institutions can also justify CCB program approval (Love & Palmer, 2020).

Expenses Associated With CCB Programs

College administrators invest a great deal of time and resources in developing and implementing CCB programs. For example, in Florida, community colleges must first obtain approval from the State Board of Education and subsequently submit a proposal to the regional accrediting agency, which is a long and laborious process (McKinney and Morris, 2010). According to one college administrator in the state of Ohio, the process could take between 18 months and two years (Filby, 2017). However, some schools in Florida have implemented CCB programs within the same year as the state policy was enacted (Kramer et al., 2020).

Submitting a CCB degree proposal and fulfilling the requirements of the regional accrediting agency can get pricey. In some states, community colleges can expect to pay approximately $925 for each proposal and endure a $3300 fee for each visit to the regional accrediting agency (Filby, 2017). The regional accrediting agency requires the community college to have a set number of faculty members who hold a terminal degree in the specific field of the CCB program (McKinney and Morris, 2010). The agency also requires the community college to have adequate library resources that meet the proposed CCB program’s needs and

matches the resources available at four-year institutions. Community college administrators could spend over $630,000 to establish one four-year degree program (Filby, 2017).

Community college administrators must also meet with regional four-year colleges and universities administrators to lay out their strategic plan for the proposed CCB program (McKinney and Morris, 2010). The strategic plan essentially establishes the need (i.e., labor market demand, student demand, low program existence, or institutional capacity limit) for the CCB program within a state or region and reduces the chances of program duplications (Love & Palmer, 2020; McKinney and Morris, 2010). However, community college leaders are susceptible to resistance from their four-year counterparts.

Organizational Change

Organizational changes at community colleges have become apparent post-CCB implementation. Most CCB-adopting community colleges still carry the same name after implementing baccalaureate degree programs, but other institutions have changed their name and gained four-year status (Levin, 2004; Russell, 2010). For example, Parkersburg Community College in West Virginia is now West Virginia University at Parkersburg, and Brevard Community College in Florida is now Eastern Florida State College (Russell, 2010).

Research suggests that CCB-adopting institutions raise tuition and fees to compensate for CCB degree program requirements and rely less on public funds (Ortagus & Hu, 2020; 2019). In some states, tuition and fees are the same for all four years of the community college program. Yet, in other states, there are differences in the tuition and fees for courses leading to the associate's degree and courses leading to a bachelor's degree (Fulton, 2015). More specifically, in some states, students must pay higher tuition and fees for the 3rd and 4th year of the degree

program. Nevertheless, community colleges with CCB programs are still more affordable than four-year institutions (USDE, 2017d).

Type of Baccalaureate Degrees Offered

Baccalaureate degree programs at the community college lead to different degree types, such as applied or traditional. Baccalaureate degrees offered in traditional vocational programs are known as applied degrees. These degrees include the Bachelor of Applied Science (BAS), Bachelor of Applied Technology (BAT), Bachelor of Applied Behavioral Science (BABS), and Bachelor of Applied Arts (BAA). CCB institutions also offer the more traditional baccalaureate degree, including the Bachelor of Science (BS) and Bachelor of Arts (BA). The type of degree conferred by community colleges varies by state and depends on the state policy's specifics (Love & Palmer, 2020). Across states, many of the baccalaureate programs offered are in STEM fields. Two of the most common CCB programs and most researched are nursing and teacher education.

Nursing Degree Outcomes

CCB programs that lead to the Bachelors of Science in Nursing (BSN) are of the most common programs across states. Advanced nursing positions (e.g., specialty nurses and case managers) that require the BSN are in high demand (Nightingale College, 2020). The ubiquity of CCB nursing programs has prompted researchers to investigate their effect on state-level nursing degree production (Daun-Barnett, 2011; Daun-Barnett, 2014; Porter et al., 2014).

The research on CCB nursing degree production is limited to three studies that present conflicting results. The first publication on CCB nursing degree outcomes came in 2011 (Duan-Barnett, 2011). The group used ordinary least square (OLS) regression models with fixed effects and data extracted from a national dataset ranging from 2000 to 2008 for all public and private

two-year and four-year institutions across the U.S. At the time of this study, 36 CCB programs were available across 17 states, with CCB nursing degree programs in six states: Florida, Indiana, Louisiana, Nevada, Utah, and Washington. The group ran separate analyses for the public institutions and all public and private institutions to determine if gains observed at public institutions were due to losses at private institutions. Their findings revealed a positive effect on nursing degree production for public institutions and a small but positive impact on nursing degree production at all institutions. These results indicated an increase in nursing degree production post CCB authorization and that the gains were not due to enrollment shifts from private to public institutions.

Two other publications on CCB nursing degree production (Daun-Barnett, 2014; Porter et al., 2014) presented findings that were contradictory to Daun-Barnett's (2011) results. Both Daun-Barnett (2014) and Porter et al. (2014) were interested in the effects of CCB implementation on four-year nursing degree attainment but used different analysis units. One study looked at degree production at the regional level (Daun-Barnett, 2014), and the other examined degree production at the state level. The regional-level study used OLS with community-fixed effects and DiD models (Duan-Barnett, 2014). Like Daun-Barnett (2011), this group used a national data source; however, they also gathered data from regional web sources for five regions in Florida between 2001 and 2009 for all degree-granting public and private institutions. Also, similar to Daun-Barnett (2011), the group found an increase in nursing degrees. However, disaggregation revealed that the positive effect resulted from an increase in associate's degrees and not bachelor's degrees solely. In addition, the DiD estimate was not statistically significant, suggesting that the nursing degree increase was due to factors other than the state adoption of CCB policy. In line with this, the state-level study's findings revealed null

effects across states, including Florida, for CCB nursing degree production (Porter et al., 2014). The state-level study used OLS with state-fixed effects and national data ranging between 1997 and 2011 for all degree-granting public and private institutions (Porter et al., 2014). The findings from the two latter studies suggest that the positive effects observed in the 2011 study were due to increasing associate's degrees in nursing and not bachelor's degrees.

According to previous researchers, CCB nursing programs were available in Florida, Indiana, Louisiana, Nevada, Utah, and Washington when they conducted their analyses. Assuming that institutions within a state implemented CCB programs in the same year as CCB authorization (refer to Table 1). Also, considering that associate's degree holders need a minimum of two years to complete a baccalaureate degree, non-degree holders need four years, and the average student takes about six years (Stewart, 2020), the previous analyses suffered from a short timeframe to produce graduates. Time impacted the number of CCB institutions available and program capacity limits. It is not clear how many nursing programs were available in each state during prior research. However, a recent search, between the years of 1997 and 2011, found no CCB nursing graduates in Louisiana, ten graduates in Indiana, 15 graduates in Nevada, 19 graduates in Washington, 65 graduates in Utah, and 1,028 graduates in Florida (raw data from IPEDS, 2020). Furthermore, given the existing shortages in nursing labor markets, these findings suggest that the number of graduates produced does not allow existing negative trends to recompense. In other words, the nursing workforce was already lacking in numbers. Therefore, new nursing graduates will need to make up for nurse market lack before positive outcomes become apparent. As of 2019, there are close to 13,000 nursing graduates across these six states and over 14,000 graduates across the U.S. This growth in graduates suggests that new explorations will potentially discover positive effects.

Considering that community colleges are the most racially diverse higher education institutions across the U.S., researchers have also investigated the impact of CCB policies on the number of racially diverse students completing the BSN degree. Statistics show that the nurse workforce is 80.8 percent White, 6.2 percent Black, and 5.3 percent Hispanic (American Association of Colleges of Nurses [AACN], 2019). These statistics demonstrate that Black and Hispanic students are underrepresented compared to the growing population of Black and Hispanic residents in the U.S (USCB, 2019). A diverse nursing workforce is essential to improving cultural competence within healthcare fields and reducing health disparities (Moore & Continelli, 2016). Research exploring the effects of CCB policies on racial diversity revealed a national decrease in nursing degree production for Black students (Daun-Barnett, 2011). However, four-year nursing degree completion in Florida for Hispanics increased, yet the increase appeared to be associated with population growth rather than CCB-adoption (Daun-Barnett, 2011). These findings may insinuate the need for intentional outreach for historically underserved students (Cuellar & Gandara, 2020). Conversely, as described previously, researchers concluded these outcomes from a small and unrepresentative sample. Current research may find alternate results.

Teacher Education Degree Outcomes

There is a growing teacher shortage in U.S. public primary and secondary schools (Garcia & Weiss, 2019); thus, another typical CCB program leads to the B.S. or BAS in teacher education. CCB teacher education programs prepare teachers to teach curriculums in English, special education, elementary education, early childhood education, and STEM education. Of relevance to this study are STEM education graduates. The STEM teacher shortage in the U.S. is profound, which has harmed the math and science scores of K-12 students and has contributed to

low scores on the Program for International Student Assessment (PISA; Desilver, 2017; Hansen et al., 2019; NCES, 2018). The PISA results provide a global view of how student performance in reading, math, and science match up. According to PISA results, the U.S. falls behind several other international education systems (NCES, 2018). Shortages in the number of qualified STEM teachers have a downstream effect on college enrollment and the persistence of STEM students, which, in turn, impacts the STEM workforce.

Undesirable salaries plague the primary and secondary teacher workforce. Teachers' weekly earnings are 21.4 percent lower than their non-teaching peers (Garcia & Weiss, 2019). Wage gaps are associated with high teacher turnover and attrition. In the wake of overwhelming STEM teacher shortages, establishing alternative pathways to obtaining teacher education credentials is justified. Traditionally, certified teachers receive education at four-year institutions with approved teacher education programs (Stoddart & Floden, 1995). With the growing teacher crisis, states have entertained alternate pathways to teaching such as lateral entry, Teach for America programs (Glazerman et al., 2009), and, of interest, CCB programs. CCB programs reduce the costs of obtaining a four-year teacher education degree, potentially increasing student interest in teacher education programs. Accordingly, CCB teacher education programs are widespread across the country.

The research on the outcomes of CCB teacher education programs is limited to two studies, however. In 2018, one study examined four-year teacher education degrees production nationally and ran a separate analysis for Florida (Park et al., 2018). The other study, published in 2014, focused on Florida's regional outcomes alone (Daun-Barnett, 2014). Daun-Barnett (2014) used data ranging from 2001 to 2009, and Park et al. (2018) used national data ranging from 1995 to 2013. The two studies presented inconsistent data regarding Florida. Daun-Barnett

(2014) revealed null effects from a fixed-effect model and a not statistically significant DiD estimate. However, Park et al. (2018), using a DiD model with state and year fixed-effects, revealed an increase in CCB teacher education degree production. One plausible explanation for these differences is CCB program expansion, or in other words, larger sample sizes, as Park et al. (2018) included more years and institutions. Between 2001 and 2009, a total of 1,063 students completed a bachelor's degree in teacher education from an institution conferring both two-year and four-year degrees in Florida. Between 1995 and 2013, the number of graduates in Florida reached 3,724 (raw data from IPEDS, 2020). As of 2019, there are 7,977 graduates in Florida and 13,700 graduates across the U.S (raw data from IPEDS, 2020). As of 2019, STEM education graduates account for 1,684 teacher education degrees across seven states.

Similar to the necessity to diversify the nursing workforce, there is also a need to diversify the teacher labor force. The percentage of Black (7%) and Hispanic (9%) teachers lag behind that of White teachers (80%) in public primary and secondary schools (USDE, 2016; NCES, 2019c). This racial gap among teachers is significant. One reason is that minority students are more successful in classrooms and spaces populated by minority teachers and staff members (Fairlie, 2014; Bargh, 1997; Greenwald & Banaji; 1995; Gurin et al., 2002; King & Kitchener, 1994; King & Shuford, 1996; Langer, 1978; Paiget, 1971). Existing research on the outcomes of CCB teacher education programs reveals inconsistent effects on the racial diversity of students obtaining the teacher education degree nationally (Park et al., 2018), and negative associations with the racial composition of Black and Hispanic students obtaining the CCB degree in teacher education in Florida (Park et al., 2018). These findings suggest that CCB institutions may need to devote efforts to intentionally target historically underserved students to diversify their teacher education graduate pool (Cuellar & Gandara, 2020).

What is Missing?

The existing research on the outcomes of CCB programs leaves a great deal of room for future exploration. A comprehensive look at how CCB programs impact the total number of STEM degrees produced per state is missing from the literature. If students are not pursuing CCB nursing or teacher education degrees, what CCB degrees are they seeking? The literature is also missing a complete picture of how CCB programs are impacting diversity across STEM fields. If minority students are not pursuing CCB nursing or teacher education degrees, what CCB degrees are they seeking? The literature is missing the outcomes of women seeking the CCB degree altogether. What CCB degrees are women pursuing? Are women pursuing CCB degrees other than nursing? This study builds on the work mentioned above by taking a comprehensive look at the effects of CCB programs on state-level four-year STEM degree outcomes and examining the impact for Black students, Hispanic students, and female students.

Summary

Few studies have explored CCB program outcomes (Daun-Barnett, 2011; Daun-Barnett, 2014; Park et al., 2018; Porter et al., 2014). The studies that have explored CCB program outcomes are limited to nursing and teacher education programs and present conflicting findings. Nursing and teacher education, specifically STEM education, are a small piece of a giant puzzle. The larger puzzle represents all fields of study that fall underneath the STEM umbrella. To date, the extent to which CCB authorization impacts STEM baccalaureate degree attainment is not empirically evident. This chapter provided an overview of the existing literature and discussed how this study adds to the CCB repertoire. This research seeks to determine the impact of state authorization of four-year degree programs at community colleges on the number of four-year STEM degrees produced. I use human capital theory as a framework to explain the potential

relationship between CCB programs and four-year STEM degree production. In the following chapter, I describe the methodology used to conduct the analyses.

CHAPTER 3: METHODS

Over the last 30 years, 28 states have authorized their community colleges to offer baccalaureate degree programs. The number of graduates completing four-year STEM degree programs is of interest since there is a nationwide shortage of workers with STEM credentials. STEM bachelor's degree completion data is available for all schools within each state, before and after the first class of community college baccalaureate (CCB) STEM graduates. The availability of these data presented me an opportunity to conduct a quasi-experiment to determine the state-level impact of CCB programs on STEM bachelor's degree production and composition by answering the following questions:

1. To what extent has CCB-implementation affected state-level STEM baccalaureate degree production?
2. To what extent has CCB-implementation affected state-level STEM baccalaureate degree production for Black and Hispanic students?
3. To what extent has CCB-implementation affected state-level STEM baccalaureate degree production for women?

I disaggregated the data by race, gender, and institution type to investigate heterogeneous effects. This section includes a description of the research design, the assumptions, the data, the variables, and the models used for the analyses.

Research Design

For this research, I applied a difference-in-differences (DiD) approach to determine the state-level impact of CCB programs on four-year STEM degree production and composition. Researchers use quasi-experimental methods to investigate causal effects when a randomized controlled trial (RCT) is not possible or feasible. Quasi-experimental approaches, like DiD, offer

an alternative route to achieving random assignment. DiD is considered as good as random under the assumption that some population members' exposure to an exogenous entity was out of their control. At the same time, other members of the same population are not exposed (Furquim et al., 2020). The outcomes for the unexposed group help estimate a counterfactual or what would have happened without the treatment. The counterfactual removes various factors that might cause endogeneity issues allowing the researcher to emulate randomization and assess causal effects.

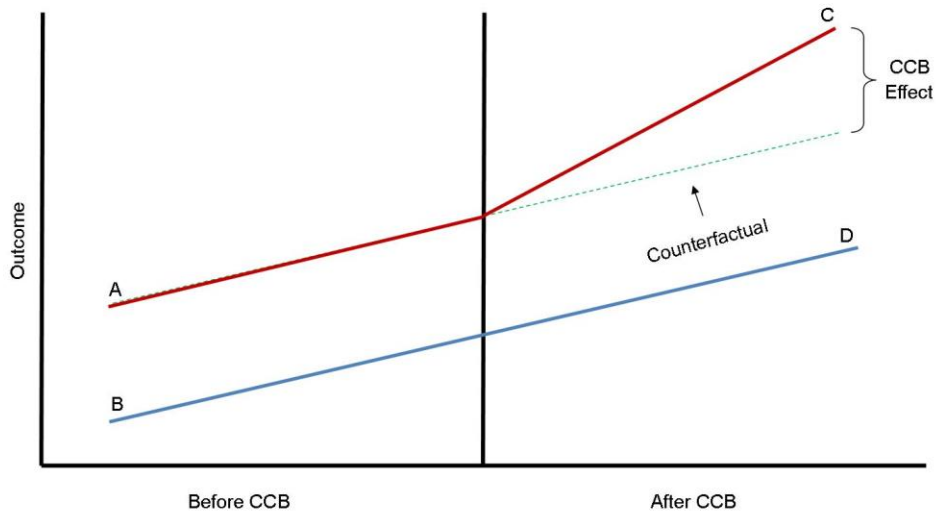
The DiD design uses panel or longitudinal data gathered before and after a treatment period. In this study, the first year of CCB STEM graduates in a particular state establishes the before and after periods. I chose this research design because it provides a more straightforward way to measure the causative influence of CCB programs on STEM baccalaureate degree attainment and the share of credentials awarded to students of color and women compared to other quasi-experimental designs. DiD estimates the effect of an intervention on a population by comparing the changes in mean outcomes over time between the treatment and control groups. In other words, the method estimates two differences, demonstrated by Equation 1and Figure 2.

Equation 1:

$$DiD = (C - A) - (D - B)$$

Figure 2.

Graph Explanation of DiD.



Note. This figure provides a visual of how the DiD research design functions. The horizontal axis represents the pre/post-treatment period, with a vertical line separating before and after state approval of a CCB policy. The vertical axis represents the outcome variable, which, in this case, is the number of STEM degrees produced. The red line represents the treatment group (i.e., CCB states), the blue line represents the control group (i.e., non-CCB states), and the green dotted line represents the counterfactual. The letter A represents the mean outcome for CCB states before CCB authorization, and C represents the mean outcome for CCB states after CCB authorization. The letter B represents the mean outcome for non-CCB states before CCB authorization, and D represents the mean outcome for non-CCB states after CCB authorization. The bracket highlights the effect of the intervention (i.e., CCB authorization).

The first difference (C-A) calculates the mean outcome (i.e., the number of STEM degrees produced) for the treated group (i.e., CCB states) by comparing the number of degrees conferred before and after the treatment (i.e., CCB implementation). The same comparison is made for the control group (i.e., non-CCB states) to calculate the second difference. The second difference (D-B) represents the outcome that would have occurred without the treatment (i.e., CCB implementation). Subtracting the second difference from the first difference removes any secular trends and reduces internal validity threats (Murnane & Willett, 2011). After deducting the second difference from the first difference, the remaining estimate represents the unconditional effect of the treatment.

To improve the precision of the DiD estimator, I added state and year fixed-effects and control variables to the model. I controlled for time-invariant factors between states and changes in the year-to-year trends in degree production and rates by including state and year fixed-effects. With the addition of control variables, I accounted for alternate trends that might exist due to the type of data used and the particular context of the study. For this research, I utilized state-level data. State characteristics are likely to fluctuate. These fluctuations could correlate with the treatment and outcome variable, which may bias my treatment effect estimates. Therefore, I included covariates that control for varying state characteristics in the model to improve the DiD estimates' accuracy and ensure the model is appropriately specified (Furquim et al., 2020). These variables controlled for unemployment rates and population growth. I discuss the reasoning for each covariate later in this chapter.

Assumptions of the DiD Approach

To estimate the effect of the treatment on the treated group using the DiD design, individual assumptions and threats must be addressed to establish internal validity. Establishing

high internal validity is key to validating the causal relationship between the independent and dependent variables. The following paragraphs will describe key assumptions and threats to the internal validity of this study.

Strict Exogeneity

First, the DiD research design is considered as good as random only if the treatment is exogenous. Thus, one of the DiD research design's main assumptions is strict exogeneity, which encompasses temporal precedence and maturation (Shadish et al., 2002). Temporal precedence means that the intervention must occur before the effect, and maturation means that the treatment and control groups cannot display diverging trends ahead of the intervention. Simply put, the treatment must be unrelated to the outcome at baseline to preserve strict exogeneity. Before state authorization of CCB policies, four-year degree programs were limited to four-year institutions in all states. This restriction alone ensures the temporal order of events for community colleges. It would be impossible for community colleges to confer four-year degrees without state authorization and program implementation. However, this is a state-level analysis that includes all associate's and bachelor's degree-granting institutions within a state. Therefore, I conducted a parallel trends test to determine if CCB and non-CCB states followed similar trajectories ahead of the first class of CCB STEM graduates.

Parallel Trends Assumption

In studies with multiple pre-treatment years, such as this one, researchers can validate common trends with graphical representation (refer to Figure 2; Wing et al., 2018). I provided a general example of what uninterrupted common trends look like before treatment previously in Figure 2. To satisfy the parallel trends assumption, the trend in both the treated and control groups should be the same in the absence of the treatment. If an effect appears ahead of the

treatment, the strict exogeneity condition is at risk of being violated. In that case, the ability of the DiD design to eliminate unobservable confounders is lost. Since five years of pre-treatment data is available, I measured the degree production and composition trends in CCB and non-CCB states ahead of the treatment year. The visual evidence presented in chapter four demonstrates that CCB and non-CCB states followed similar trends before the first class of CCB STEM graduates.

In addition to the visual proof, I conducted lead analyses using an event study model to measure the year-to-year changes in degree production and composition in the period leading up to the treatment year (Furquim et al., 2020). This model indirectly assesses whether or not the slopes produced by CCB and non-CCB states are parallel. I created lead and lag variables that represent interactions between the treatment and standardized time indicators. Each variable generates a coefficient that captures the year-to-year difference between the treatment and control groups. I use the year before treatment as the reference year. I followed up the lead analyses with joint hypothesis tests to verify that the sum of the year-to-year changes was not significantly different from zero. If the yields of the lead analyses and joint hypothesis tests showed that there were no significant differences, I was confident that the parallel trends assumption had been satisfied. I discuss the outcomes of these assessments in chapter four.

SUTVA

Another assumption of the DiD approach is the Stable Unit Treatment Value Assumption (SUTVA). The SUTVA assumption states that the intervention group's treatment must not spill over into the control group. Given the observational nature of this study, SUTVA is of concern. In addressing SUTVA, self-selection is an issue. Self-selection refers to the notion that treated entities may choose to expose themselves to the treatment instead of the exposure occurring

randomly. Choosing to be exposed to the treatment could mean that the outcome is not due to the treatment but to other factors driving the decision. In this study, states choose to pass legislation allowing community colleges to confer four-year degrees, and community colleges choose to implement CCB programs. The decision to authorize and establish CCB programs could mean that individual states and community colleges are different from others. While the DiD research design accounts for unobserved heterogeneity while requiring little to no control variables, I included state and year fixed-effects. I also added covariates that control varying state characteristics in the analysis to eliminate the risk of biasing the treatment effect. Other than that, I assumed that CCB and non-CCB states only differ by the presence of a CCB policy, CCB STEM programs, and CCB STEM graduates.

Attrition

Attrition, or treated entities choosing to no longer be a part of an experiment, is also a potential threat to internal validity. However, this will not be an issue for this study. Given the time and resources necessary to enact state policies, it is not likely that state legislators would not allow time to see the effects of CCB policies. Furthermore, given the grueling and costly process to earn accreditation for CCB programs, it is not likely that after implementing a CCB program, a particular community college will decide to do away with it.

Regression, Testing, and Instrumentation

Researchers also describe regression, testing, and instrumentation as threats to internal validity (Shadish et al., 2002). Regression refers to outliers moving towards the average effect over time without the treatment's impact. Since community colleges were only authorized to offer up to a two-year degree before CCB programs, regression is not concerning in this respect. The production of four-year STEM degrees conferred by community colleges can only be due to

state adoption of CCB programs. However, this study includes state-level data for all two-year and four-year degree-granting public and private institutions. Changes in degree production at four-year institutions are possible. The outcomes of the lead analyses and joint hypothesis tests described in chapter four ensure common trends between CCB and non-CCB states, eliminating this concern.

Regarding testing, which refers to a population's repetitive exposure to treatment over time that creates a familiarity or comfort with the treatment, the unprecedented nature of CCB programs eliminates the testing threat. Lastly, instrumentation relates to changes in the way outcomes are measured. The requirements for the bachelor's degree awarded at the community college are the same as the criteria at all other bachelor's degree-granting institutions. Therefore, instrumentation, along with regression and testing, do not present threats to this study.

Data

To answer the research questions of interest, I used provisional data in the Integrated Postsecondary Education Data System (IPEDS) for all degree-granting U.S. public and private two-year and four-year institutions ranging from 1990 to 2019. IPEDS is an interconnected system that houses national survey data collected annually by the United States Department of Education (USDE, 2020). The data I extracted from IPEDS includes 4,149 institutions (refer to Table 2 for the number of institutions in each public and private sector). Of these 4,149 institutions, I identified 109 public institutions across 21 states offering a mix of associate's and bachelor's degrees (refer to Appendix A for a list of all institutions per state). To isolate these institutions, I selected institutions categorized as Baccalaureate/Associate's Colleges: Associate's Dominant (coded as the number 14) and Baccalaureate/Associate's Colleges: Mixed Baccalaureate/Associate's (coded as the number 23). Since state authorization of CCB programs,

some institutions have gained four-year status but still confer associate's degrees. IPEDS classified some of these institutions as Master's Colleges & Universities: Small Programs, Baccalaureate Colleges: Arts & Sciences Focus, and Baccalaureate Colleges: Diverse Fields (coded as 20, 21, and 22, respectively). To further verify the two-year degree-granting status of each institution, I perused each of their websites and curriculum catalogs. Table 3 shows the number of public institutions per classification within each state. I did not include some states with active CCB policies in the treatment group because CCB STEM programs currently do not exist within some states. These states include Missouri, North Dakota, Ohio, Oregon, South Carolina, Wisconsin, and Wyoming. I excluded additional units from the treatment group because of insufficient post-treatment data due to only recently gaining policy authorization (i.e., California, Colorado, Delaware, Michigan)

Table 2.

Total Public and Private Two-Year and Four-Year Institutions.

Sector of Institution	Institution Count
Public Four-Year & Above	788
Private Non-Profit Four-Year & Above	1630
Private For-Profit Four-Year & Above	377
Public Two-Year	855
Private Non-Profit Two-Year	97
Private For-Profit Two-Year	402
Total	4149

Note. This table shows the count of institution-types included in this study.

Table 3.

Total Public Institutions Offering A Mix of Two-Year and Four-Year Degrees.

State	Institution Count	Carnegie Classification 14	Carnegie Classification 20	Carnegie Classification 21	Carnegie Classification 22	Carnegie Classification 23
Arkansas	1	0	0	0	1	0
California	15	15	0	0	0	0
Colorado	3	3	0	0	0	0
Delaware	1	1	0	0	0	0
Florida	27	16	0	0	0	11
Georgia	7	2	0	0	1	4
Hawaii	1	1	0	0	0	0
Indiana	1	1	0	0	0	0
Lousiana	1	0	0	1	0	0
Michigan	5	5	0	0	0	0
North Dakota	1	1	0	0	0	0
New Mexico	1	0	0	0	0	1
Nevada	3	2	0	0	0	1
New York	3	0	0	0	1	2
Oklahoma	2	1	0	0	0	1
Texas	4	3	0	0	0	1
Utah	3	1	1	0	0	1
Vermont	1	0	0	0	0	1
Washington	26	25	0	0	0	1
Wisconsin	1	1	0	0	0	0
West Virginia	2	1	0	0	0	1
Total	109	79	1	1	3	25

Note. This table displays the count of institutions with a particular Carnegie Classification code within a state.

In addition to the IPEDS data, I also extracted data from the Community College Baccalaureate Association (CCBA), the U.S. Bureau of Labor Statistics (BLS), and the U.S. Census Bureau (USCB). The CCBA is an association that supports the community college system, focusing on closing racial and economic gaps by promoting affordable access to baccalaureate degrees. I used the data extracted from the CCBA as another checkpoint to confirm CCB programs at particular schools within specific states. Control variable data came from the BLS and the U.S. Census Bureau. The BLS is a statistical agency in the U.S. that provides information on unemployment, occupations, wages, and working conditions. The U.S. Census Bureau is a statistical agency that includes demographic information on the U.S. population.

Variables

The primary unit of analysis for this research is the state. An active CCB policy, CCB STEM program, and a record of CCB STEM graduates within a state distinguishes the treatment group from the control group. I used states with institutions lacking these characteristics to set up the counterfactual conditions. The counterfactual offers an idea of what would have happened in the absence of the treatment. In this study, the assumption is that states only differ by the presence or absence of the features listed above. However, I included covariates that control varying state characteristics and applied state and year fixed-effects to control time-invariant heterogeneity between states and over time.

I present all variables used in this study in Table 4. The outcome variables of interest are the number of four-year STEM degrees produced overall and by women, Black, Hispanic students. In addition, I explored the share of degrees produced by race/ethnicity and gender identity. *POST,* the pre-post indicator, and *CCB,* the treatment indicator, are dichotomous

variables that take on a value of either zero or one. *URATES* and *POPGROW* are the control variables.

Table 4.

Variables.

Variable	Source	Variable Name	Type
Dependent Variables			
Total STEM degrees	IPEDS	STEM	Continuous
Total Black	IPEDS	BLACK	Continuous
% Black	Calculated	PTBLACK	Continuous
Total Hispanic	IPEDS	HISPANIC	Continuous
%Hispanic	Calculated	PTHISPANIC	Continuous
Total Women	IPEDS	WOMEN	Continuous
% Women	Calculated	PTWOMEN	Continuous
Independent Variable			
Pre-Post Indicator	CCBA, Fulton (2020, 2015); Povich (2018); Russell (2010)	POST	Binary: 1=Y 0=N
CCB implementation	CCBA, Fulton (2020, 2015); Povich (2018); Russell (2010)	CCB	Binary: 1=Y 0=N
Control Variables			
Unemployment rates	BLS	URATES	Continuous
Population Growth	USCB	POPGROW	Continuous

Note. This table displays the variables used in this study.

Dependent Variable

I examine three main post-CCB implementation effects, including state-level differences in the overall number of four-year STEM degrees awarded, the number of STEM degrees awarded to women, Black, and Hispanic students, and state-level changes in the proportion of women, Black, and Hispanic students earning STEM baccalaureate degrees. I use the definition constructed by the National Science Foundation (NSF) to define STEM (NSF, 2017; NSF, 2020). The NSF classifies chemistry, computer and information technology, engineering, geosciences, life sciences, mathematical sciences, physics, astronomy, and social sciences as STEM majors. Teacher education programs focusing on STEM subjects are also considered STEM majors (Funk & Parker, 2018). Except for the teacher education programs, I filtered the IPEDS data by two-digit Classification of Instructional Programs (CIP) codes to isolate the STEM degrees. The CIP is sub-divided into a three-level structure of either two, four, or six digits. The two-digit CIP code is the broadest categorization level, and the six-digit code is the lowest level. I used the six-digit CIP code to isolate the STEM teacher education degrees. Tables 5, 6 & 7 show the CIP codes of interest. Note that data ranging from 2010 to 2019 uses the 2010 CIP classification, whereas data ranging from 2003 to 2009 uses the 2000 CIP classification, 1992 to 2002 data uses 1990 CIP classification, and 1987 to 1991 uses 1985 CIP classification. Also, note that compared to the 2010 and 2000 CIP codes, the 1990 and 1985 CIP codes separate Agriculture and Agriculture Operations and Related Sciences into two categories: Agriculture Business and Production and Agricultural Sciences (see Table 6). Additionally, after 1994, the 1990 and 1985 CIP classification only includes the highest categorization level. Consequently, data on STEM education degrees are not available for these years. To ensure that the data only contained four-year degrees, I set the Award Level code to the bachelor's degree. I grouped the IPEDS data by

state, race, and gender, which allowed for examining the number of STEM degrees produced for each state by race/ethnicity and gender.

Table 5.

CIP Codes of Interest.

CIP Code Number	CIP Code Name
01	Agriculture, Agriculture Operations and Related Sciences
03	Natural Resources and Conservation
10	Communication Technologies/Technicians
11	Computer and Information Sciences and Support Services
14	Engineering
15	Engineering Technologies and Engineering-related Fields
26	Biological and Biomedical Sciences
27	Mathematics and Statistics
29	Military Technologies and Applied Sciences
40	Physical Sciences
41	Science Technologies/Technicians
42	Psychology
45	Social Sciences
47	Mechanic/Repair Technologies/Technicians
51	Health Professions and Related Programs

Note. This table shows the 2010 and 2000 CIP code versions used to isolate STEM degrees completed.

Table 6.

CIP Code Differences for 1990 and 1985.

CIP Code Number	CIP Code Name
01	Agricultural Business and Production
02	Agricultural Sciences

Note. This table shows the 1990 and 1985 CIP code versions that differ from the 2010 and 2000 versions. I will use these codes to isolate Agricultural-related degree completions before 2003.

Table 7.

CIP Codes for STEM Education Degree Programs.

CIP Code Number	CIP Code Name
13.1301	Agricultural Teacher Education
13.1307	Health Teacher Education
13.1309	Technology Teacher Education/Industrial Arts Teacher Education
13.1311	Mathematics Teacher Education
13.1316	Science Teacher Education/General Science Teacher Education
13.1317	Social Science Teacher
13.1319	Technical Teacher Education
13.1320	Trade and Industrial Teach Education
13.1321	Computer Teacher Education
13.1322	Biology Teacher Education
13.1323	Chemistry Teacher Education
13.1327	Health Occupations Teacher Education
13.1329	Physics Teacher Education
12.1332	Geography Teacher Education
13.1335	Psychology Teacher Education
13.1337	Earth Science Teacher Education
13.1338	Environmental Education

Note. This table shows the CIP codes for all STEM education degree programs.

Heterogeneous Effects

To get a sense of variability in the data, researchers often explore the heterogeneity of the average treatment effect (Varadhan & Seeger, 2013). Variability in the data is due to characteristics that make the individuals in the sampled population different. Investigating heterogeneous effects allowed me to explain the direction and magnitude of the outcome variable representing the total number of four-year STEM degrees. Individuals included in this study differ, at least, by race, gender, and the type of institution conferring the degree.

Race and Gender

Compared to White students (60.3%), Hispanic (10.2%) and Black (6.5%) students earn a smaller share of STEM baccalaureate degrees (USDE, 2017b). Likewise, women (36%) also earn fewer STEM bachelor's degrees than men (USDE, 2017b). Given the reduced costs of completing the bachelor's degree at a community college, students of color or women are likely to persist to degree completion at these institutions. Thus, in addition to investigating STEM degree production overall, I explored the number of degrees earned by Black, Hispanic, and female students.

I also explored changes in the composition of degrees because a shift in the number of degrees conferred does not necessarily mean an alteration in the ratio of degrees awarded to various groups. The number of degrees earned by a particular group must change relative to another group for the composition to change. For example, colleges/universities in a specific state confer 10,000 STEM baccalaureate degrees in a particular year. Assume 7,000 of those degrees are earned by White students, 1,500 by Hispanic students, and 1,000 by Black students. This breakdown means White students account for 70 percent of the STEM degrees awarded, Hispanic students 15 percent, and Black students 10 percent. If in the following year, the number

of degrees increases to 20,000 and the proportions remain the same, the number of degrees awarded to each racial group would increase proportionally. Conversely, if Hispanic students were to earn 5,000 of those 20,000 degrees, that would leave 15,000 degrees to White and Black students. This change in the number of degrees for Hispanic students shifts the composition of degrees conferred. So now, White students account for 50 percent of the degrees, Hispanic students 25 percent, and Black students 10 percent.

Institution Type

I disaggregated public and private institution data to see where gains and losses in overall degree production occurred. “Despite the growing demand for higher education, there is, in theory, a fixed number of students interested in earning their bachelor’s degree” (Kramer et al., 2020, p. 3). This theory suggests that community colleges' economically appealing price tag could attract students from other institutions. In other words, students who would usually attend the four-year public or private institution may choose to enroll at a more affordable community college that confers bachelor’s degrees. This scenario could be problematic for the proposed study since positive results could be due to students' redistribution between institution-types and not actual gains in degree production.

Previous researchers have specified models to test this hypothesis (Daun-Barnett, 2011; Porter et al., 2014), where the outcome variable represents the number of degrees for public (or private) institutions only. This setup allowed the researchers to assess whether students were shifting from private to public institutions. If students moved from private to public institutions, gains would be shown for all public institutions but would disappear when factoring in private institutions. Most researchers investigating the impact of CCB programs on degree production have not found statistically significant findings to validate enrollment shifts (Daun-Barnett,

2011; Porter et al., 2014). However, a recent study using program-level data provided evidence that CCB adoption has negatively affected enrollment and degree production at neighboring four-year private for-profit institutions in Florida (Kramer et al., 2020). I adjusted the dependent variable in the models to assess degree production and composition at public and private institutions separately. I discuss these results in chapter four.

Independent Variable

An existing CCB policy, CCB STEM program, and CCB STEM graduates differentiate the treated states from the control states. I used previous publications and other public information to confirm CCB policies within states (refer to Table 1 for a list of all 28 states with CCB policies; CCBA,2020; Fulton, 2020, 2015; Laramie County Community College, 2019; Povich, 2018; Russell, 2010). I also filtered the IPEDS data by Carnegie Classifications to identify institutions awarding two-year and four-year degrees (refer to Table 3). I treat states receiving CCB authorization after 2012 as controls since time constraints do not allow for enough classes to have graduated from CCB-institutions within these states. States enacting CCB policies after 2012 include California, Colorado, Delaware, Michigan, Ohio, Missouri, South Carolina, Oregon, and Wyoming. Classifying these states as controls leaves 15 out of 28 states in the treatment group. Refer to Table 8 for a list of the treated states. Table 9 displays the states in the control group.

Table 8.

CCB States and Year of First CCB STEM Graduates.

State	Year
Arkansas	2003
Florida	2004
Georgia	2010
Hawaii	2012
Indiana	2007
Louisiana	2005
New Mexico	2009
Nevada	2002
New York	1999
Oklahoma	2006
Texas	2009
Utah	1997
Vermont	1995
Washington	2009
West Virginia	2003

Note. This table presents the year when the first class of CCB STEM graduates appears in the data.

Table 9.

Control Group States and Random Year Used To Establish Post-Period.

State	Year
Alaska	2004
Alabama	2010
Arizona	2007
Conneticut	2005
Iowa	1999
Idaho	1997
Illinois	2010
Kansas	2007
Kentucky	1999
Massachusetts	2012
Maryland	2003
Maine	2004
Minnesota	1997
Missouri	2010
Mississippi	1997
Montana	2005
North Carolina	2004
North Dakota	1997
Nebraska	1997
New Hampshire	2004
New Jersey	2005
Ohio	2005
Oregon	1999
Pennsylvania	2002
Rhode Island	2004
South Carolina	2006
South Dakota	2012
Tennessee	2009
Virginia	2009
Wisconsin	1995
Wyoming	2007
California	2005
Colorado	1995
Delaware	1995
Michigan	2010

Note. This table shows the random treatment years used to establish the post-treatment period and standardize the time variable.

Establishing Treatment Periods

While the implementation of and enrollment into a CCB program is likely soon after state authorization, the data available suggests that for some institutions, enrollment into CCB STEM programs began at a later time (See Appendix D). As an illustration, state legislators in West Virginia approved CCB programs in 1989. However, the first STEM graduates in West Virginia finished in 2003. This timeframe suggests that students likely began enrolling in the CCB STEM programs eight or more years after CCB authorization, sometime between 1997 and 2001. For this reason, I established the pre/post-treatment periods for each state using the year in which the first CCB STEM graduates appeared in the data (refer to Table 8). I estimated the year of enrollment into the CCB STEM program based on the time it typically takes a student to complete a bachelor's degree. Four years is the minimum to earn a four-year degree, but, on average, students take about six years to complete a four-year degree (Stewart, 2020). Furthermore, if a student already holds an associate's degree, they could satisfy the four-year degree requirements in two years. Using West Virginia as an example, the enrollment period could have begun in either 2001, 2000, 1999, 1998, or 1997. I use this enrollment period to confirm parallel trends between CCB and non-CCB states.

Since the treatment year varies across states, I could not use the standard two-group two-period DiD approach to estimate the treatment effect. If the year of first graduates were the same for all states, I would designate a single year to separate the before and after treatment periods. Unfortunately, that was not the case for this study. There were multiple treatment years, as shown in Table. 8. I randomly assigned a treatment year to each control state to establish the post-treatment period to combat this challenge. I present the random treatment year assignment for each control state in Table 9.

Applying a treatment year to each state in the control group allowed me to standardize the treatment years to yield five pre-treatment and six post-treatment years. I standardized the treatment year such that year zero equals the first year of CCB STEM graduates. There are 600 observations once the time variable is standardized. This adjustment presents 900 fewer cases than when the treatment year is unstandardized. When the time indicator is not standardized, each state (n=50) per year (n=30) serves as a case for a total of 1500 cases.

Control Variables

The DiD research design controls for secular trends between treatment and control groups (Daun-Barnett, 2014). However, adjusting for other time-varying factors that could influence degree production increases confidence in this study's results. For this reason, I used data from the U.S. Bureau of Labor Statistics (BLS) and the U.S. Census Bureau to gather unemployment rates and population growth for use as control variables. Low unemployment is associated with a decrease in community college enrollment (Smith, 2018). The decline in college enrollment numbers at the end of the Great Recession in 2010, as unemployment rates decreased, is an excellent example of this scenario. In addition, research shows that adult learners, or those 25 and older, leave community college when the economy is stable to join or rejoin the workforce (Smith, 2018). Therefore, it was essential to account for variations in unemployment rates. I also accounted for population growth since a more populated state has more potential students, and having more students could influence the number of degrees produced.

Descriptive Statistics

Table 10 through Table 12 presents the descriptive statistics for all outcome variables and covariates. Table 10 displays the average statistics for all institutions in a state, and Table 11 and Table 12 show the same averages for public and private institutions, respectively. The average

number of four-year STEM degrees conferred across the country is approximately 12,000 per state, with the lowest number of degrees earned in a state being 314 and the highest about 109,000. Public institutions account for roughly 68 percent of degrees out of that average. The overall average number of Black and Hispanic graduates differs by about 40 degrees. However, more Black students complete the degree at private institutions. More women earn the STEM credential at public institutions, but the average share is larger at private institutions. Some states have zero Black STEM graduates, and the same is true for Hispanic students and women. On average, about seven percent of the degrees awarded in a state go to Black students and approximately five percent to Hispanic students. These percentages are lower than expected (USDE, 2017b). Interestingly, on average, these data demonstrate that women account for more than 50 percent of STEM bachelor's degrees in a state, higher than the 36 percent previously mentioned (USDE, 2017b). This higher proportion of women could be due to nursing and teacher education degrees included in this study.

Table 10.

Descriptive Statistics for All Institutions.

	M	SD	Min	Max
Dependent Variables				
Number of STEM Degrees:	12018.95	13348.95	314	108820
Number Of STEM Degrees: Black Students	942.05	1223.82	0	7306
Number Of STEM Degrees: Hispanic Students	901.22	2483.93	0	31389
Number Of STEM Degrees: Women	6491.63	7475.06	127	60862
Share Of STEM Degrees: Black Students	6.84%	6.79%	0.00%	32.53%
Share Of STEM Degrees: Hispanic Students	4.78%	6.00%	0.00%	45.21%
Share Of STEM Degrees: Women	52.61%	5.51%	24.59%	64.87%
Independent Variables				
Unemployment Rate	5.44	1.85	2.22	13.73
Population	5842208	6465062	453690	39500000
Observations	1500			

Note. This table displays the descriptive statistics for all institutions.

Table 11.

Descriptive Statistics for Public Institutions Only.

	M	SD	Min	Max
Dependent Variables				
Number of STEM Degrees:	8249.42	9436.10	299	87153
Number Of STEM Degrees: Black Students	636.68	854.25	0	4911
Number Of STEM Degrees: Hispanic Students	662.90	2022.36	0	26632
Number Of STEM Degrees: Women	4284.34	5111.11	121	47176
Share Of STEM Degrees: Black Students	6.46%	6.49%	0.00%	30.46%
Share Of STEM Degrees: Hispanic Students	4.71%	6.24%	0.00%	45.17%
Share Of STEM Degrees: Women	50.89%	5.70%	23.61%	64.67%
Independent Variables				
Unemployment Rate	5.44	1.85	2.22	13.73
Population	5842208	6465062	453690	39500000
Observations	1500			

Note. This table displays the descriptive statistics for public institutions.

Table 12.

Descriptive Statistics for Private Institutions Only.

	M	SD	Min	Max
Dependent Variables				
Number of STEM Degrees:	3769.53	5149.52	0	36204
Number Of STEM Degrees: Black Students	305.37	430.89	0	3096
Number Of STEM Degrees: Hispanic Students	238.32	538.35	0	4784
Number Of STEM Degrees: Women	2207.30	3051.43	0	21151
Share Of STEM Degrees: Black Students	8.49%	9.60%	0.00%	50.97%
Share Of STEM Degrees: Hispanic Students	4.76%	6.26%	0.00%	100.00%
Share Of STEM Degrees: Women	58.93%	8.89%	25.00%	100.00%
Independent Variables				
Unemployment Rate	5.44	1.85	2.22	13.73
Population	5842208	6465062	453690	39500000
Observations	1500			

Note. This table displays the descriptive statistics for private institutions.

Analytic Approach

This study has multiple treatment years, unlike the simple two-group two-period DiD approach that uses a single treatment year to separate the before and after treatment periods (Furquim et al., 2020). Equation 2 displays a standard two-group two-period DiD regression model.

Equation 2:

$$\gamma_{(it)} = \beta_0 + \beta_1 \textit{time} + \beta_2 \textit{treatment} + \beta_3 (\textit{time x treatment}) + \beta_4 (X) + \varepsilon_{(it)}$$

Where $\gamma_{(it)}$ is the dependent variable for a unit *i* during a time period *t*, β_0 is the baseline average, and *time* is a dichotomous variable that encompasses the time trend by taking a value of zero for all time periods occurring before the treatment and a value of one for all time periods after that. The next term, *treatment*, is a dichotomous variable that encompasses the treatment status, taking a value of zero for all control units and one for all treated units. Following is *time x treatment*, an interaction term that calculates the difference between the two groups before and after the treatment (i.e., the DID estimate). This term takes a value of one for all treated units post-treatment and a value of zero for all other units pre/post-treatment. The next term, *X*, is a vector of control variables used to reduce the possibility of unconditional confounding, and the last term is the error term.

To tackle the challenge of varying treatment years, I developed two models to explore the effects of CCB STEM programs on state-level STEM bachelor's degree attainment and composition. In the first model, represented by Equation 3, the *POST* indicator takes on a zero value in the pre-treatment period and one in the post-treatment period. Since the treatment year varies across CCB states, I randomly assigned a treatment year to establish the post-treatment period for control states (refer to Table 9 for the random year assignment). *CCB* represents the

treatment variable where I code CCB states as one and non-CCB states as zero. With these indicators, I created an interaction action term, *POSTCCB*, that calculates the difference between CCB states and non-CCB states before and after the first class of CCB STEM graduates. I attempted to improve the precision of this model by adding state and year fixed-effects and covariates (refer to Equation 4). I clustered the standard errors at the state-level.

Equation 3:

$$\gamma_{(it)} = \beta_0 + \beta_1 POST_{(it)} + \beta_2 CCB_{(it)} + \beta_3 (POSTCCB)_{(it)} + \varepsilon_{(it)}$$

Equation 4:

$$\gamma_{(it)} = \beta_0 + \beta_1 POST_{(it)} + \beta_2 CCB_{(it)} + \beta_3 (POSTCCB)_{(it)} + \beta_4 (X)_{(it)} + \alpha_i + \delta_t + \varepsilon_{(it)}$$

In the second model, I do not assign a treatment year to the control states. I use a two-way fixed-effect model to estimate the DiD. I allow the state-fixed effects to subsume the treatment variable (*CCB*), and the time variable (*POST*) is replaced by the interaction term (*POSTCCB*) due to collinearity. Equation 5 represents this model. *X*, as previously described, is a vector of controls used to reduce the possibility of unconditional confounding, and the last term is the error term. Again, I clustered the standard errors at the state-level.

Equation 5:

$$\gamma_{(it)} = \beta_0 + \beta_1 POSTCCB_{(it)} + \beta_2 X_{(it)} + \alpha_i + \delta_t + \varepsilon_{(it)}$$

In addition to the models described previously, I conducted analyses using an event study model to examine year-to-year changes before and after treatment. The previous models yielded a single effect, whereas the event study model estimates a coefficient for each year before and after the treatment. Since this specification produces an outcome for each pre-treatment year, I also used this model to confirm parallel trends. I assigned a random treatment year to the control units and then standardized the treatment years to generate the time indicators for this model.

Lead# and *Lag#* are dichotomous variables that take on a value of one for a particular standardized pre- or post-treatment year and zero for all other years. For example, $Lead2_{(it-2)}$ represents two years before treatment. This variable takes on a value of zero for all years except for two years pre-treatment. *LeadCCB#* and *LagCCB#* are interaction terms between the time and treatment indicators. These terms estimate the difference between CCB and non-CCB states relative to the reference year. I used n-1 as the reference year since it is the year before the first class of CCB STEM graduates and clustered the standard errors at the state level. Equation 7 is a simplified version of Equation 6, where the summation term is a vector of (m) lead and (q) lag indicators. Treatment occurs at time k, which can vary across units, and a coefficient is produced for jth lead or lag of the indicator

Equation 6:

$$\gamma_{(it)} = \beta_0 + \beta_1 Lead0_{(it)} + \beta_2 Lead2_{(it-2)} + \beta_3 Lead3_{(it-3)} + \beta_4 Lead4_{(it-4)} + \beta_5 Lead5_{(it-5)} + \beta_6 Lead0CCB_{(it)} + \beta_7 Lead2CCB_{(it-2)} + \beta_8 Lead3CCB_{(it-3)} + \beta_9 Lead4CCB_{(it-4)} + \beta_{10} Lead5CCB_{(it-5)} + \beta_{11} Lag1_{(it+1)} + \beta_{12} Lag2_{(it+2)} + \beta_{13} Lag3_{(it+3)} + \beta_{14} Lag4_{(it+4)} + \beta_{15} Lag5_{(it+5)} + \beta_{16} Lag6_{(it+6)} + \beta_{17} Lag1CCB_{(it+1)} + \beta_{18} Lag2CCB_{(it+2)} + \beta_{19} Lag3CCB_{(it+3)} + \beta_{20} Lag4CCB_{(it+4)} + \beta_{21} Lag5CCB_{(it+5)} + \beta_{22} Lag6CCB_{(it+6)} + \beta_{23} X_{(it)} + \alpha_i + \delta_t + \varepsilon_{(it)}$$

Equation 7:

$$\gamma_{(it)} = \beta_0 + \sum_{m}^{q} \beta_1 CCB_{(it)} (t=k+j) + \beta_2 X_{(it)} + \alpha_i + \delta_t + \varepsilon_{(it)}$$

Summary

I utilized a DiD approach to determine the impact of CCB implementation on STEM degree production and composition. The dependent variables of interest are the number of STEM degrees produced after CCB implementation and the proportion of those degrees awarded to Black, Hispanic, and female students. I define the treatment year as the year in which the first class of CCB STEM students graduated. To address the variation in treatment years across states, I specify two models. One model utilizes the random assignment of treatment years to establish a post-treatment period, while the other does not. I add control variables (i.e., unemployment rates and population statistics) to each model to reduce endogeneity issues and incorporate state and year fixed-effects. I also conducted an event study to assess year-to-year changes in the pre-treatment period. The outcomes from these analyses verified parallel trends in all models.

CHAPTER 4: RESULTS

A policy enacted in more than 25 U.S. states targeting community colleges could positively impact the STEM bachelor's degree outcomes of women and students of color, specifically Black and Hispanic students. These policies authorize community colleges to develop four-year degree programs and confer bachelor's degrees. Four-year STEM degrees in disciplines such as health science, technology, and science education are the outcome of many of these programs (refer to Appendix B for a list of CCB programs). Therefore, a shift in the number of STEM baccalaureate degrees in policy-adopting states is plausible. This study looks at three main post-CCB implementation effects: state-level differences in the overall number of four-year STEM degrees awarded, the number of STEM degrees awarded to women, Black, and Hispanic students, and state-level changes in the proportion of women, Black, and Hispanic students earning STEM baccalaureate degrees.

In this chapter, I detail the results of the quantitative analyses performed. First, I descriptively explore the number and share of four-year STEM degrees conferred before and after treatment. Then I demonstrate how this research adheres to the parallel trends assumption. Providing evidence that a comparable number of four-year STEM degrees existed in CCB and non-CCB states ahead of the enacted treatment substantiates the effects of the research design chosen for this study. Following these findings are the results of the event study models performed to validate the parallel trends assumption. Subsequently, I explore the relationship between CCB STEM programs and state-level four-year STEM degree attainment with and without random treatment years for control states. These analyses reveal the effect of CCB programs on STEM degree production overall and for women, Black, and Hispanic students at

the state level. These analyses also illustrate the influence of CCB STEM programs on the state-level racial and gender diversity of students earning the STEM baccalaureate degree.

Descriptive Portrait

I extracted the data used for this research from IPEDS. The data includes the number of STEM baccalaureate degrees conferred at all institutions across the nation from 1990 to 2019. I chose degree completion data over college enrollment data since IPEDS only allows CIP code aggregation of the degree completion data. The CIP codes enable me to filter out the STEM baccalaureate degree data. While college enrollment data by CIP code was inaccessible, I could still estimate the inaugural year of student enrollment using the STEM degree completion data. Given the year of the first class of CCB STEM graduates, students more than likely enrolled into the program two, three, four, five, or six years before graduation. For instance, it is possible that a student holding an associate's degree enrolled in a CCB STEM program and completed the four-year degree within two years. It is also plausible that a student took six years to matriculate, given the average student takes about six years to complete a bachelor's degree (Stewart, 2020). I used these potential enrollment years to assess the pre-treatment trends in CCB and non-CCB states. I will discuss the results of this analysis later.

I defined the treatment year as the year when the first class of CCB STEM graduates appears in each state's degree completion data (refer to Table 8 and Appendix D). The treatment year varied across states (refer to Table 8). Therefore, I could not use the standard two-group two-period DiD approach. Since the first class of CCB STEM students graduated during different years for each CCB state, I used multiple years to define the post-treatment period for non-policy adopting states (refer to Table 9). I randomly designated a treatment year for these states to gather descriptive statistics before and after treatment. In addition to non-policy

adopting states, a random treatment year was used for states with no CCB STEM graduates and states with insufficient post-treatment data.

Table 13 to Table 15 displays the descriptive portrait of the outcome variables and covariates, along with the unconditional (raw) DiD estimate. The tables are categorized by CCB and non-CCB states and divided by before and after treatment data. The columns labeled "Difference" calculate the mean differences between each dependent variable's pre- and post-treatment periods. The raw DiD estimate is the difference between the CCB-Difference and non-CCB-Difference columns. I implemented Equation 1, presented in Chapter 3, to calculate the outcomes in Table 13 to Table 15. The coefficient for the interaction term in the basic regression model, represented by Equation 2, also calculates the unconditional DiD estimates presented in these tables.

Table 13 displays the means and standard deviations (SD) for each outcome variable before and after conferring the first STEM bachelor's degrees at all institutions in CCB states. Table 13 also exhibits the means and standard deviations for non-CCB states for comparison. According to the descriptive statistics presented in Table 13, CCB states produced over 6,200 more four-year STEM degrees after treatment. The control states awarded a little more than 2,700 degrees. Taken together, this estimates that after the first class of CCB STEM graduates, CCB states awarded approximately 3,500 more four-year degrees. After clustering the standard errors at the state level, this increase in the number of STEM bachelor's degrees awarded post-treatment in CCB states is not statistically significant. While not significant, the results suggest a positive impact for historically underrepresented groups. CCB states awarded more than 450 STEM baccalaureate degrees to Black students with the first class of CCB STEM graduates and almost 600 more than before for Hispanic students. Women earned roughly 2,000 extra degrees.

Table 13.

Means and Standard Deviations for All Institutions.

	CCB States					Non-CCB States					
	Before		After			Before		After			
	Mean	SD	Mean	SD	Difference	Mean	SD	Mean	SD	Difference	**raw DID**
Number of STEM Degrees	9511.63	9411.91	15750.83	17103.01	6239.20	10241.50	9905.93	12958.56	14918.07	2717.06	3522.14
Number Of STEM Degrees: Black Students	843.24	1028.73	1516.08	2031.89	672.85	715.93	729.87	937.42	1115.17	221.49	451.36
Number Of STEM Degrees: Hispanic Students	739.97	1342.70	1899.40	3484.37	1159.43	410.22	1068.57	970.22	3006.34	560.00	599.43
Number Of STEM Degrees: Women	4849.59	4949.91	8852.19	9859.38	4002.61	5222.49	5178.33	7227.58	8401.25	2005.08	1997.52
Share Of STEM Degrees: Black Students	7.44%	7.52%	7.47%	6.63%	0.03%	6.28%	6.12%	6.82%	7.07%	0.55%	-0.51%
Share Of STEM Degrees: Hispanic Students	6.26%	8.16%	8.70%	9.36%	2.45%	2.59%	2.61%	4.46%	4.10%	1.87%	0.58%
Share Of STEM Degrees: Women	50.17%	5.95%	54.83%	4.52%	4.66%	49.62%	5.76%	55.14%	3.50%	5.52%	-0.86%
Unemployment Rate	5.53	1.44	5.56	2.09	0.03	5.29	1.51	5.53	1.44	0.25	
Population	6424048	6261884	7124930	7663898	700882.00	5598295	6006476	5307488	6312654	-290807	

Note: *p < .05. **p < .01. ***p < .001. This table provides the means and standard deviations for the treated (CCB states) and untreated (non-CCB states) groups for all institutions. The difference between the group means is used to calculate a preliminary DiD estimate.

Table 14.

Means and Standard Deviations for Public Institutions.

	CCB States					Non-CCB States					
	Before		After			Before		After			
	Mean	SD	Mean	SD	Difference	Mean	SD	Mean	SD	Difference	**raw DID**
Number of STEM Degrees	9511.63	9411.91	15750.83	17103.01	6239.20	10241.50	9905.93	12958.56	14918.07	2717.06	3522.14
Number Of STEM Degrees: Black Students	843.24	1028.73	1516.08	2031.89	672.85	715.93	729.87	937.42	1115.17	221.49	451.36
Number Of STEM Degrees: Hispanic Students	739.97	1342.70	1899.40	3484.37	1159.43	410.22	1068.57	970.22	3006.34	560.00	599.43
Number Of STEM Degrees: Women	4849.59	4949.91	8852.19	9859.38	4002.61	5222.49	5178.33	7227.58	8401.25	2005.08	1997.52
Share Of STEM Degrees: Black Students	7.44%	7.52%	7.47%	6.63%	0.03%	6.28%	6.12%	6.82%	7.07%	0.55%	-0.51%
Share Of STEM Degrees: Hispanic Students	6.26%	8.16%	8.70%	9.36%	2.45%	2.59%	2.61%	4.46%	4.10%	1.87%	0.58%
Share Of STEM Degrees: Women	50.17%	5.95%	54.83%	4.52%	4.66%	49.62%	5.76%	55.14%	3.50%	5.52%	-0.86%
Unemployment Rate	5.53	1.44	5.56	2.09	0.03	5.29	1.51	5.53	1.44	0.25	
Population	6424048	6261884	7124930	7663898	700882.00	5598295	6006476	5307488	6312654	-290807	

Note: *p < .05. **p < .01. ***p < .001. This table provides the means and standard deviations for the treated (CCB states) and untreated (non-CCB states) groups for public institutions only. The difference between the group means is used to calculate a preliminary DiD estimate.

Table 15.

Means and Standard Deviations for Private Institutions.

	CCB States					Non-CCB States					
	Before		After			Before		After			
	Mean	SD	Mean	SD	Difference	Mean	SD	Mean	SD	Difference	raw DID
Number of STEM Degrees	2606.48	3876.92	5214.56	7704.03	2608.08	3274.42	3813.27	4046.85	5120.00	772.42	1835.65
Number Of STEM Degrees: Black Students	253.44	360.99	463.73	690.85	210.29	227.82	225.54	326.13	431.81	98.32	111.97
Number Of STEM Degrees: Hispanic Students	159.10	275.16	473.23	812.11	314.13	121.53	236.44	271.40	618.33	149.87	164.26
Number Of STEM Degrees: Women	1389.84	2004.75	3030.23	4481.63	1640.39	1801.95	2100.58	2527.00	3220.33	725.05	915.34
Share Of STEM Degrees: Black Students	9.19%	10.73%	8.29%	8.15%	-0.90%	8.36%	8.36%	8.40%	9.07%	0.04%	-0.94%
Share Of STEM Degrees: Hispanic Students	6.16%	9.78%	8.25%	9.62%	2.09%	2.73%	2.67%	4.46%	3.58%	1.73%	0.36%
Share Of STEM Degrees: Women	55.54%	11.44%	57.19%	8.58%	1.65%	56.11%	7.61%	63.26%	6.92%	7.15%	-5.50% *
Unemployment Rate	5.53	1.44	5.56	2.09	0.03	5.29	1.51	5.48	2.12	0.20	
Population	6424048	6261884	7124930	7663898	700882	5598295	6006476	5307488	6312654	-290807	

Note: *p < .05. **p < .01. ***p < .001. This table provides the means and standard deviations for all institutions for the treated (CCB states) and untreated (non-CCB states) groups for private institutions. The difference between the group means is used to calculate a preliminary DiD estimate.

Looking at the composition of the degrees awarded, it appears that the proportion of Black students and women dropped by a little less than a percentage point (not statistically significant). On the other hand, there was a one-half percentage point increase (not statistically significant) in the share of Hispanic students completing the four-year STEM degree.

Like previous researchers, I also examined the data for heterogeneous effects based on institution type (Daun-Barnett, 2011; Porter et al., 2014). I restricted the data to only public (or private) completion data to observe the number of degrees awarded per institution type. The reasoning for this was to test the likelihood that changes in the state-level number of four-year STEM degrees are due to actual upward (or downward) surges in STEM degree production and not to students shifting from private to public institutions. If students are moving from private to public institutions, I suspect significant gains at public institutions and losses at private institutions. Alternatively, if migration has not occurred, degree production at private institutions will exhibit no substantial differences or will move in the same direction as public institutions over time. I discuss the results of the empirical analyses later. For now, I disaggregated the data by institution type to gather descriptive statistics for public and private institutions. Table 14 encompasses the comparisons for public institutions, and Table 15 holds the comparisons for private institutions.

The outcomes shown in Table 14 suggest positive relationships between CCB STEM programs and state-level STEM baccalaureate degree production at public institutions for all groups. These results indicate that with the first class of CCB STEM graduates, public institutions in CCB states graduated approximately 1,686 additional STEM bachelor's degree students (not significant) than previously. It also appears that public institutions in CCB states

graduated roughly 339 more Black students (insignificant), 435 extra Hispanic students, and 1,082 additional women.

While significance is not detected, the results presented in Table 15 indicate positive effects at private institutions for overall STEM degree production, minoritized groups, and women. It looks like CCB states produced about 1,836 extra STEM baccalaureate degrees post-treatment at private institutions. The number of degrees completed by Black students increased by roughly 112 degrees and by approximately 164 degrees for Hispanic students rose. Women earned 915 more degrees than previously.

Regarding the share of degrees awarded to particular racial and gender groups at public (refer to Table 14) and private institutions (refer to Table 15), the descriptive outcomes suggest positive effects for Hispanic students. Though, mixed results for women and negative findings for Black students. The share of Hispanic students completing the four-year STEM degree at public institutions increased slightly by more than one-half percentage point (not significant) and less than one-half percentage point at private institutions. At public institutions, the proportion of women rose by roughly one-half percentage point (not significant). In contrast, the results for private institutions suggest a significant five-and-a-half percentage point decrease for women. While not statistically significant, the percentage of Black students decreased by nearly one percentage point at private institutions and a tenth of a percentage point at public institutions.

If the evidence presented in Table 14 and Table 15 are reliable, these findings would indicate that Black and Hispanic students are not leaving private institutions. However, women do appear to take an alternate route. The outcomes suggest that the state-level number of four-year STEM degrees in CCB states for students of color and women increases. On the other hand, the proportion of women at private institutions declines significantly. This negative relationship

insinuates that women may choose public institutions over private institutions post-CCB implementation. I improve on the reliability of these models next by testing the parallel trends assumptions. Subsequently, I will add state and year fixed-effects and data on unemployment rates and population growth as covariates to the model. I also use clustering at the state level to address the unadjusted standard errors. The outcomes of the empirical approach that include fixed-effects and additional control variables will follow the exploration of the parallel trends assumption.

Parallel Trends Assumption

It is essential to satisfy the parallel trends assumption when applying the DiD design. Adhering to this assumption demonstrates that I have chosen the appropriate comparison group for this study. I examined the data for congruent pre-treatment slopes to determine whether CCB and non-CCB states follow common trends. If the two groups exhibit similar paths, it is reasonable to believe their trajectories will remain consistent if no intentional or unintentional elements disrupt this pattern. The DiD design removes the common trend and estimates an average treated effect. This treated effect indicates the impact of the treatment. In this case, the treatment combines an existing CCB policy, CCB STEM program, and CCB STEM graduates. If the control group chosen for this study does not produce the proper counterfactual conditions, this threatens the internal validity of this research. Confirming common pre-CCB program trends increases the plausibility that post-CCB program effects are due to the treatment of interest rather than preceding factors. Violations to the parallel trends assumption would render the outcomes of this study unreliable since elements other than CCB programs are influencing STEM degree production. Since I had access to multiple pre-treatment years, I explored the pre-treatment

trends in two ways- first with graphical evidence and then with an event study model (Furquim et al., 2020; Wing et al., 2018).

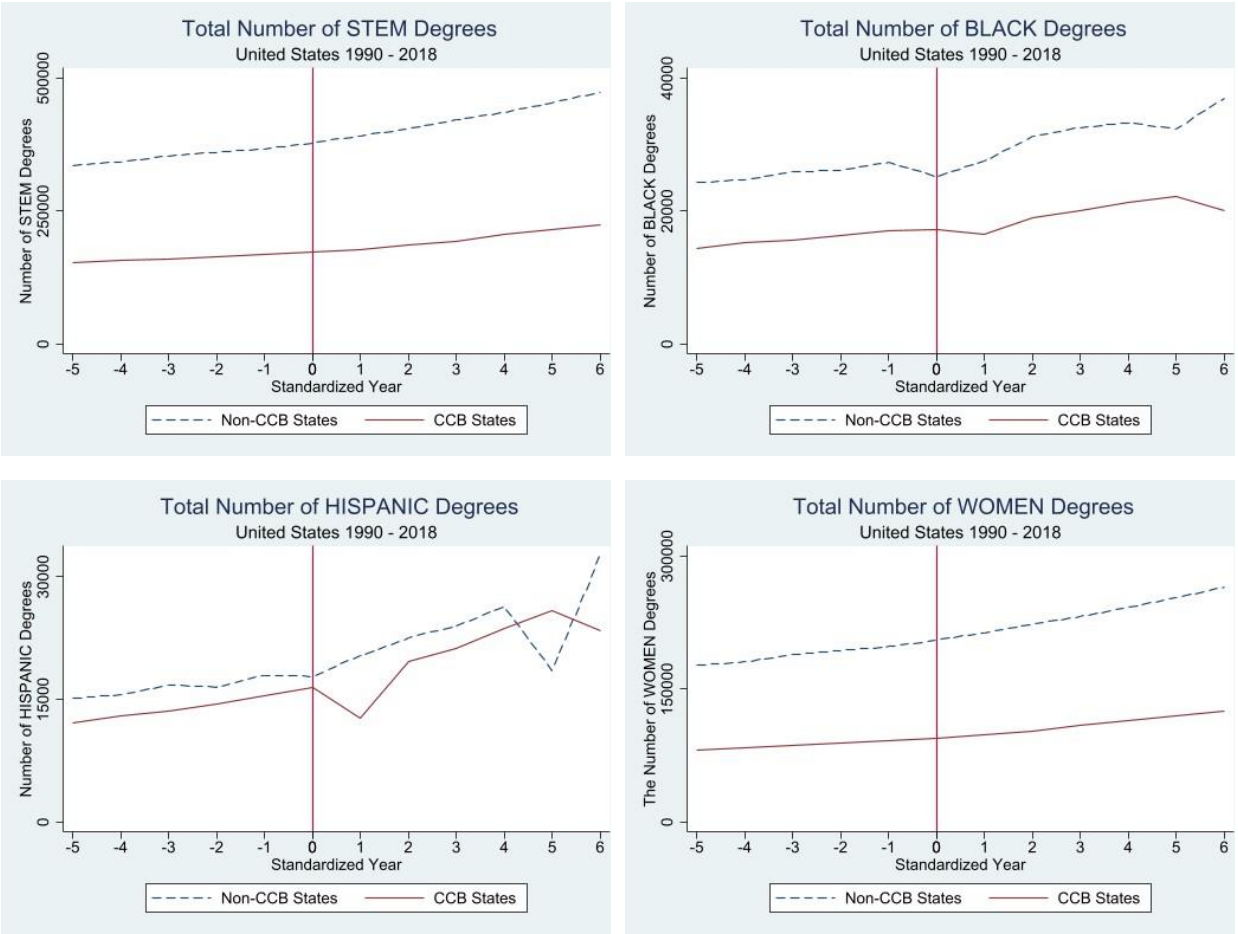
Visual Inspection

To create the parallel trend graphs, I retrieved STEM degree completion data spanning from 1990 to 2019. This timeframe allowed five years of pre-treatment data and six years of post-treatment data, with the selected treatment years ranging from 1995 to 2012. There are a total of 21 graphs demonstrating the parallel trends displayed in Figure 3 to Figure 8. I organized the graphs such that Figure 3 to Figure 5 show the trend lines for the number of degrees produced at all institutions, public institutions, and private institutions, respectively. Following the same order, Figure 6 to Figure 8 show the parallel trends for the proportion of degrees awarded.

Compared to the standard DiD design with two-groups and two-periods, the year of implementation for each state in this research varied; therefore, I could not designate a single treatment year for non-policy adopting states to determine the post-treatment period. I randomly assigned a treatment year for each control state to address this issue (refer to Table 3 for random year assignment). Since the year of first-graduates varied across states, I needed to put the treatment years on the same scale for comparison. To do this, I standardized the treatment year such that year zero equals the first year of CCB STEM graduates. The scale of the x-axis ranges from negative six to positive six. Negative numbers represent the period before the first CCB STEM graduates, and positive numbers represent the period afterward. For all graphs, the solid line represents CCB states, and the dashed line represents non-CCB states.

Figure 3.

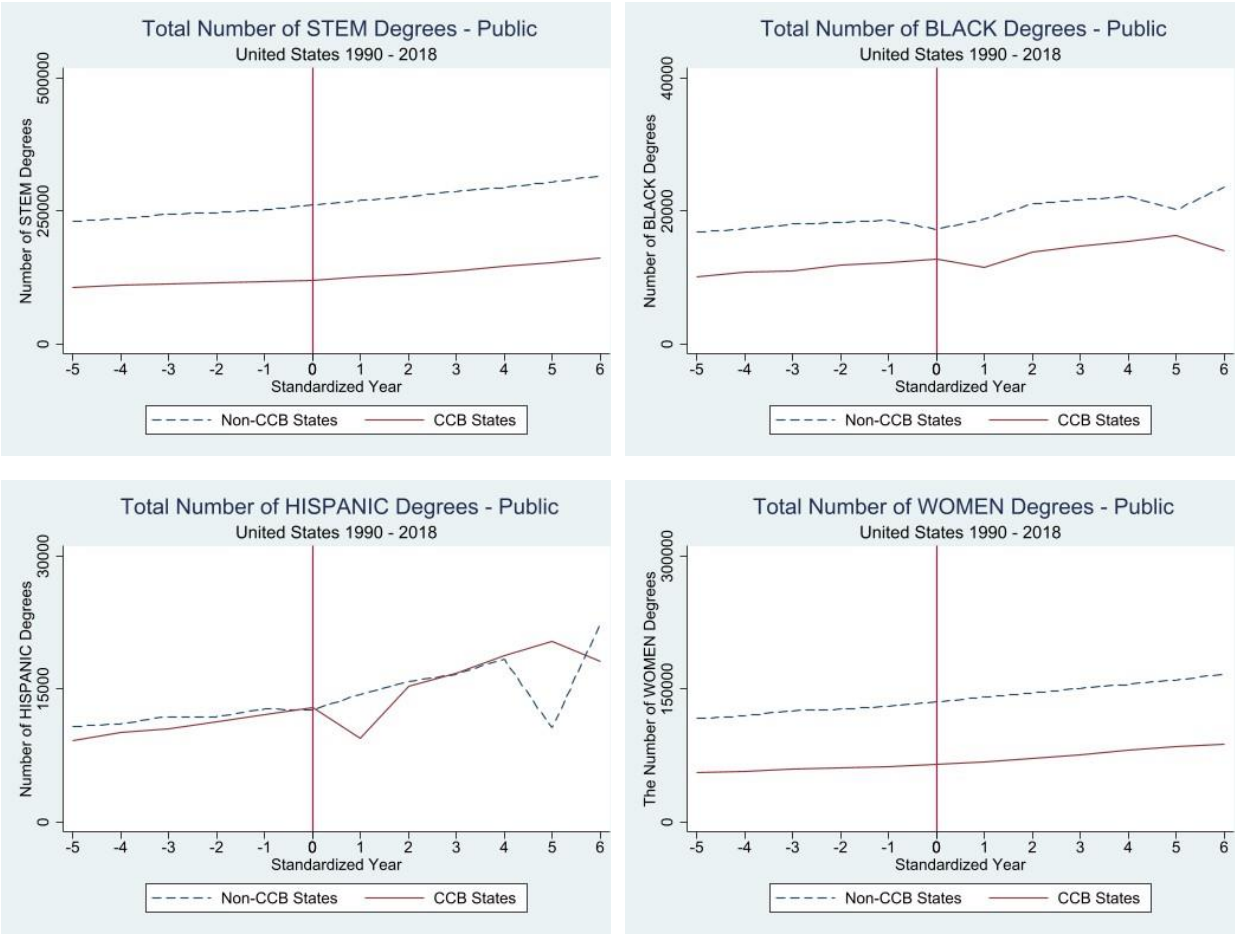
The Number of Four-Year STEM Degrees Produced – All Institutions.



Note: The graphs pictured in this figure show the pre-treatment trends for the number of degrees awarded at all institutions in CCB (solid line) and non-CCB (dotted line) states. The graph in the top-left displays the trends for the number of four-year STEM degrees conferred overall. The graph in the top-right shows the number of degrees awarded to Black students. The graph in the bottom-left displays the number of degrees awarded to Hispanic students, and I present the degrees awarded to women in the bottom-right. Visually all models pass the parallel trends assumption.

Figure 4.

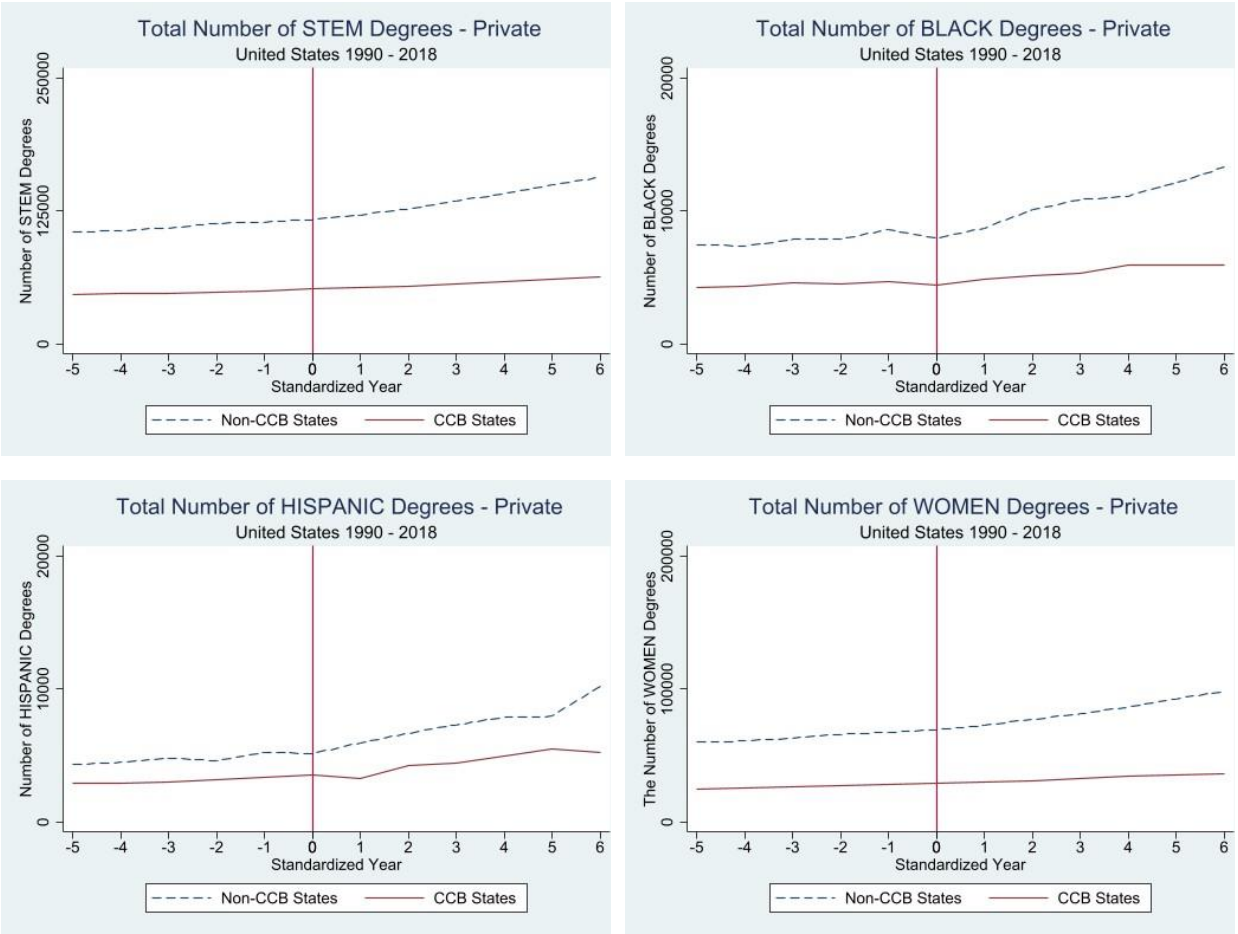
The Number of Four-Year STEM Degrees - Public Only.



Note: The graphs pictured in this figure show the pre-treatment trends for the number of degrees awarded at public institutions in CCB (solid line) and non-CCB (dotted line) states. The graph in the top-left displays the trends for the number of four-year STEM degrees conferred overall. The graph in the top right shows the number of degrees awarded to Black students. The graph in the bottom-left presents the number of degrees awarded to Hispanic students, and I present the degrees awarded to women in the bottom-right. Visually all models pass the parallel trends assumption, except for the Hispanic model.

Figure 5.

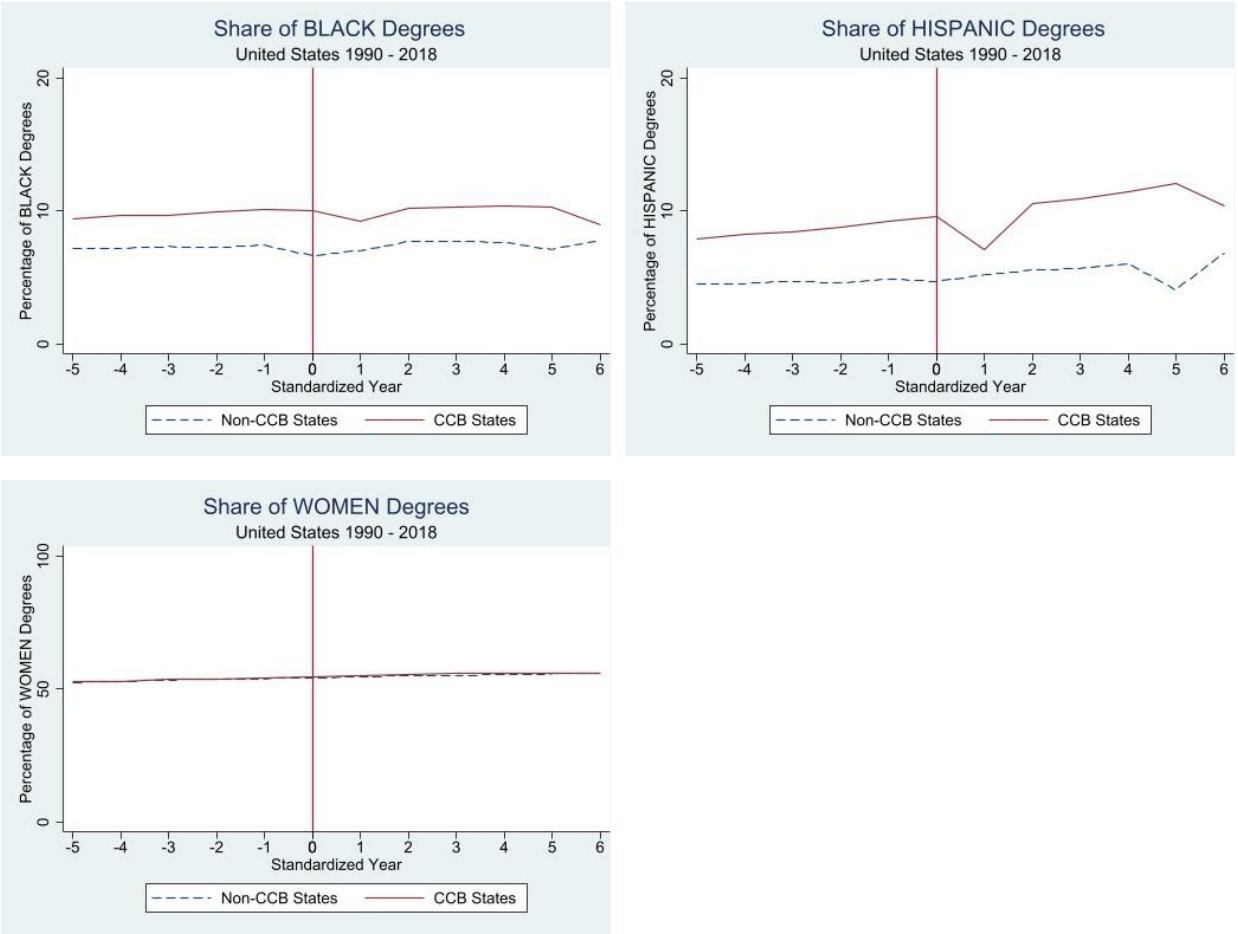
The Number of Four-Year STEM Degrees - Private Only.



Note: The graphs pictured in this figure show the pre-treatment trends for the number of degrees awarded at private institutions in CCB (solid line) and non-CCB (dotted line) states. The graph in the top-left displays the trends for the number of four-year STEM degrees conferred overall. The graph in the top-right shows the number of degrees awarded to Black students. The graph in the bottom-left presents the number of degrees awarded to Hispanic students, and I present the degrees awarded to women in the bottom-right. Visually all models pass the parallel trends assumption.

Figure 6.

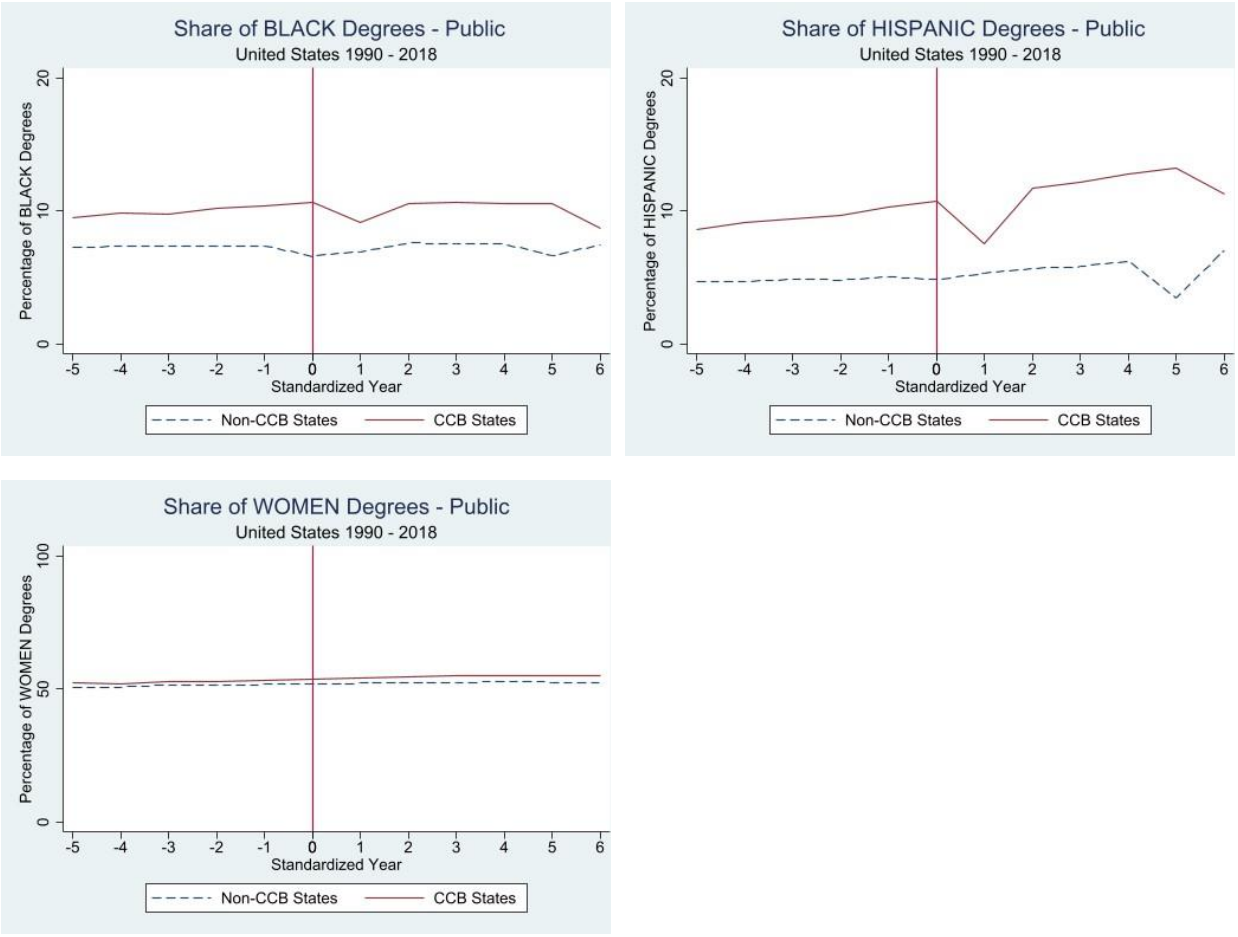
Share of STEM Degrees Awarded – All Institutions.



Note: The graphs pictured in this figure show the pre-treatment trends for the proportion of degrees awarded to specific groups at all institutions in CCB (solid line) and non-CCB (dotted line) states. The graph in the top-left displays the trends for the share of Black students earning the four-year STEM degree. The graph in the top-right shows the share of Hispanic students awarded the degree, and I display the share of women in the bottom-right. Visually all models pass the parallel trends assumption.

Figure 7.

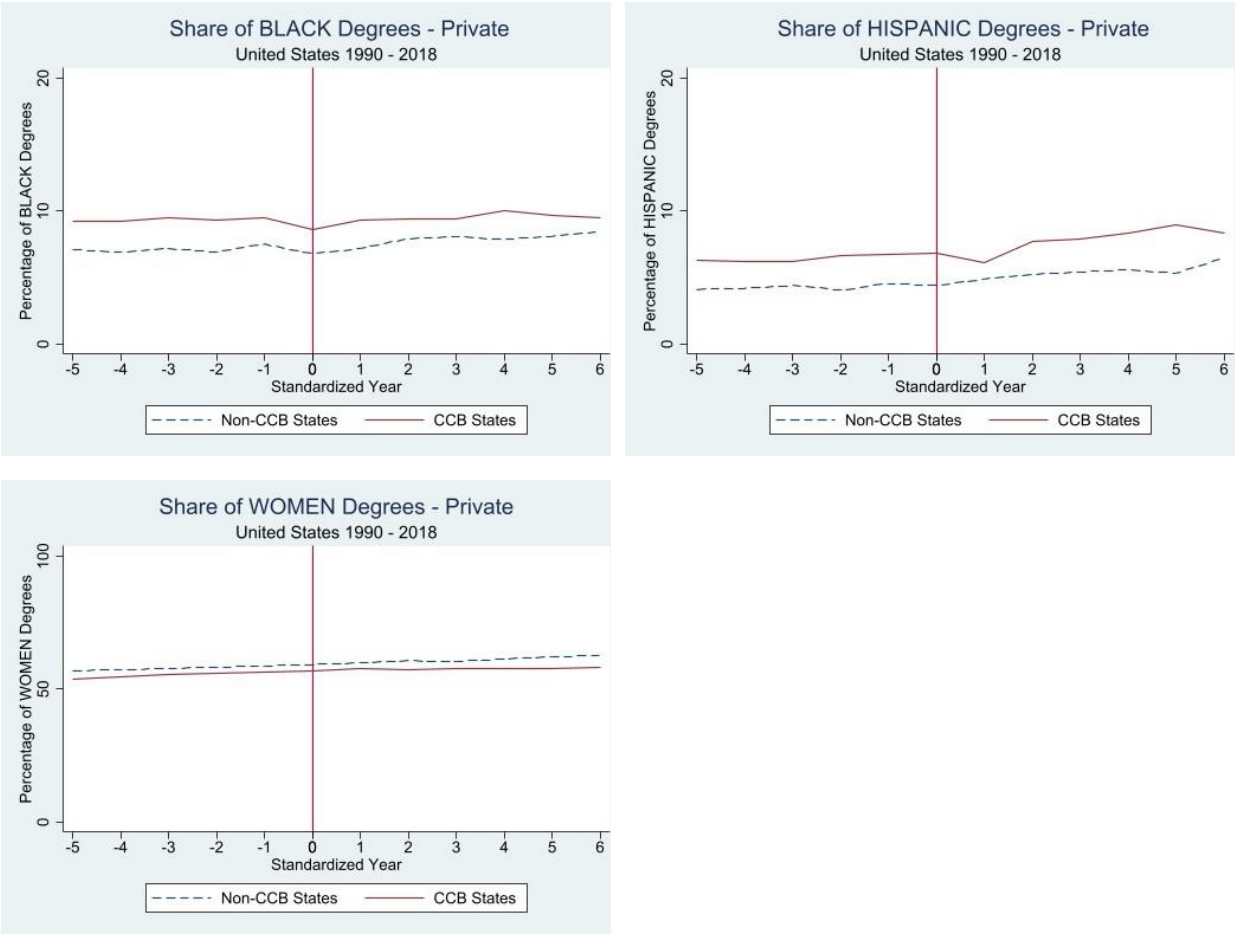
Share of STEM Degrees Awarded - Public Only.



Note: The graphs pictured in this figure show the pre-treatment trends for the proportion of degrees awarded to specific groups at public institutions in CCB (solid line) and non-CCB (dotted line) states. The graph in the top-left displays the trends for the share of Black students earning the four-year STEM degree. The graph in the top-right shows the share of Hispanic students awarded the degree, and I display the share of women in the bottom-right. Visually all models pass the parallel trends assumption.

Figure 8.

Share of STEM Degrees Awarded - Private Only.



Note: The graphs pictured in this figure show the pre-treatment trends for the proportion of degrees awarded to specific groups at private institutions in CCB (solid line) and non-CCB (dotted line) states. The graph in the top-left displays the trends for the share of Black students earning the four-year STEM degree. The graph in the top-right shows the share of Hispanic students awarded the degree, and I display the share of women in the bottom-right. Visually all models pass the parallel trends assumption.

I visually inspected each graph. There are little to no differences observed for graphs showing the number of STEM degrees overall, for women or Black students. However, the graph capturing Hispanic students at public institutions illustrates that the number of STEM degrees awarded to Hispanic students pre-treatment is affected ahead of the first year of possible CCB STEM graduates (refer to figure 4). This deviation indicates a violation of the parallel trends assumption. Nevertheless, the method used to generate the graphs shown in Figure 3 through Figure 8 does not control for differences between the treated and untreated groups, so I conducted lead analyses using an event study model to better estimate the pre-program impact. I describe the results in the following section.

Event Study

Specific quality assurance models are necessary to ensure the assumptions that validate the empirical approach are satisfied. To bolster the graphical evidence previously presented, I conducted a series of lead analyses to explore the pre-treatment effects of CCB STEM programs on state-level STEM bachelor's degree attainment and composition. I did this by employing an event study approach (Furquim et al., 2020). I included state and year fixed-effects and two control variables in the model and clustered the standard errors at the state level (refer to Equation 7). While this method is an informal test of parallel trends, it allowed me to account for variation in the treatment timing by creating lead and lag variables. These variables represent interactions between the treatment and standardized time indicators that capture the differences between the CCB and non-CCB states relative to a reference year. As a follow-up to the event study, I also conducted joint tests of significance to determine whether the year-to-year changes as a whole were statistically significant. If the pre-treatment outcomes of the event study and joint test F-statistics are not statistically significant, I can conclude that CCB and non-CCB states

follow similar trajectories. With that, I can confidently assume that I selected an appropriate comparison group and satisfied the parallel trends assumption (Furquim et. al., 2020; Murnane & Willett, 2011).

For the event study, I standardized the year variable such that year zero equals the treatment year for all states. The same random treatment years I used to create the parallel trends graphs were applied here to establish the post-treatment period for control states. I kept five years of pre-treatment data and six years of post-treatment data. I dropped all other years to ensure the data were balanced. I created interaction terms between the treatment indicator and each time variable to produce four lead variables, six lag variables, and one variable to represent year zero. I chose one year before the first class of CCB STEM graduates as the reference year and omitted it from the model. I designated this year as the reference since it represents the year before implementing the treatment. Table 16 to Table 27 exhibit the pre-treatment findings for the number of degrees produced, and Table 28 to Table 36 present the pre-treatment outcomes for the share of degrees awarded. I find no statistical significance in the year-to-year changes for any of the models. The F-statistics produced by the joint hypothesis tests are also not statistically significant. These results mean that all models pass parallel trends, confirming that I have successfully selected an appropriate counterfactual. I will describe the remaining outcomes later in the results section.

Table 16.

Event Study Outcomes – Total Stem Degrees at All Institutions.

	STEM			Add Fixed Effects			Add Unemployment Rates			Add Population		
	β	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE
All Institutions												
n-5	-102.01		329.78	-46.07		403.99	-266.49		428.68	612.36		371.77
n-4	25.02		244.86	48.98		294.84	-156.23		324.28	560.76		283.95
n-3	-99.20		199.57	-41.01		215.99	-192.19		280.28	252.28		201.09
n-2	-18.11		129.12	38.60		141.04	-45.55		160.11	188.44		114.94
n-1 (Reference)	—		—	—		—	—		—	—		—
n	1.32		225.68	12.72		166.80	-20.59		196.49	-244.28		129.42
n+1	31.94		403.04	-3.25		321.40	19.54		333.89	-419.84		215.32
n+2	125.67		571.91	-28.36		509.76	26.53		515.47	-635.63	*	309.01
n+3	194.10		828.46	25.48		695.05	109.79		679.80	-733.48		371.65
n+4	593.34		1075.90	273.64		914.73	336.31		883.81	-610.27		517.23
n+5	681.45		1324.23	268.62		1098.02	338.77		1048.16	-731.36		634.88
n+6	716.65		1554.32	296.42		1267.77	253.56		1242.29	-856.50		746.19
F-statistic	3.64	0.46		0.56	0.69		0.40	0.81		1.26	0.30	
Observations		600			600			600			600	
States		50			50			50			50	
Includes Unemployment Rates?		no			no			yes			yes	
Includes Population?		no			no			no			yes	
Includes Year Effects?		no			yes			yes			yes	
Includes State Effects?		no			yes			yes			yes	

Note: *p < .05. **p < .01. ***p < .001. This table displays the outcomes of the event study analyses. It shows the year-to-year changes in the number of degrees awarded pre- and post-treatment. I clustered the standard errors at the state level.

Table 17.

Event Study Outcomes – Total Black STEM Degrees at All Institutions.

	BLACK			Add Fixed Effects			Add Unemployment			Add Population		
	β	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE
All Institutions												
n-5	-62.50		58.03	-79.77		78.40	-67.13		71.10	4.96		62.08
n-4	-18.60		33.10	-38.09		52.58	-26.33		47.17	32.49		37.16
n-3	-30.65		29.49	-49.64		46.89	-40.97		42.81	-4.52		37.06
n-2	12.42		28.20	-0.64		51.24	4.18		48.62	23.38		46.10
n-1 (Reference)	—		—	—		—	—		—	—		—
n	103.58		64.66	54.30		35.47	56.21		34.81	37.86		29.08
n+1	-20.35		131.10	30.32		110.58	29.02		110.22	-7.02		116.95
n+2	47.09		99.71	7.01		79.33	3.86		77.46	-50.46		56.66
n+3	73.94		138.41	23.10		111.56	18.26		110.07	-50.91		91.91
n+4	145.08		166.33	113.92		137.69	110.32		137.28	32.68		110.31
n+5	228.53		204.27	129.92		149.70	125.89		149.85	38.11		130.46
n+6	-52.43		266.66	-166.83		219.06	-164.37		215.28	-255.42		207.38
F-statistic	3.91	0.42		0.57	0.68		0.54	0.71		1.37		0.26
Observations		600			600			600			600	
States		50			50			50			50	
Includes Unemployment Rates?		no			no			yes			yes	
Includes Population?		no			no			no			yes	
Includes Year Effects?		no			yes			yes			yes	
Includes State Effects?		no			yes			yes			yes	

Note: *p < .05. **p < .01. ***p < .001. This table displays the outcomes of the event study analyses. It shows the year-to-year changes in the number of degrees awarded pre- and post-treatment. I clustered the standard errors at the state level.

Table 18.

Event Study Outcomes – Total Hispanic Stem Degrees at All Institutions.

	HISPANIC			Add Fixed Effects			Add Unemployment			Add Population		
	β	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE
All Institutions												
n-5	-80.50		63.35	-122.74		112.46	-101.16		99.55	98.17		98.81
n-4	-33.83		28.10	-82.07		75.83	-61.98		65.70	100.64		84.67
n-3	-33.91		34.63	-78.52		59.57	-63.72		50.77	37.10		50.68
n-2	36.56		42.77	-6.68		68.10	1.56		63.84	54.63		58.39
n-1 (Reference)	—		—	—		—	—		—	—		—
n	134.18		110.10	32.42		72.94	35.68		72.32	-15.06		70.56
n+1	-190.94		200.40	-142.91		189.30	-145.14		189.89	-244.80		259.60
n+2	207.13		203.49	120.95		142.96	115.58		140.77	-34.61		52.61
n+3	268.67		274.01	177.18		213.43	168.93		210.61	-22.34		95.98
n+4	368.42		350.90	316.35		276.59	310.21		276.42	95.51		116.31
n+5	739.61		449.67	571.31		354.34	564.44		352.40	321.72		261.81
n+6	170.21		529.55	-43.74		406.04	-39.54		406.13	-291.32		254.27
F-statistic	3.71	0.45		0.68	0.61		0.55	0.70		0.48	0.75	
Observations		600			600			600			600	
States		50			50			50			50	
Includes Unemployment Rates?		no			no			yes			yes	
Includes Population?		no			no			no			yes	
Includes Year Effects?		no			yes			yes			yes	
Includes State Effects?		no			yes			yes			yes	

Note: *p < .05. **p < .01. ***p < .001. This table displays the outcomes of the event study analyses. It shows the year-to-year changes in the number of degrees awarded pre- and post-treatment. I clustered the standard errors at the state level.

Table 19.

Event Study Outcomes – Total Women Stem Degrees at All Institutions.

	WOMEN			Add Fixed Effects			Add Unemployment			Add Population		
	β	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE
All Institutions												
n-5	-95.14		211.84	-67.50		275.47	-201.04		293.90	340.87		241.05
n-4	-26.75		140.72	-15.68		188.52	-139.99		209.68	302.11		175.93
n-3	-80.71		94.17	-57.49		126.55	-149.07		165.94	124.99		120.98
n-2	-23.55		55.70	-0.66		79.66	-51.64		95.61	92.64		69.96
n-1 (Reference)	—		—	—		—	—		—	—		—
n	16.29		141.77	22.40		98.84	2.22		119.56	-135.71		75.41
n+1	47.42		256.98	28.52		211.44	42.33		221.15	-228.60		144.39
n+2	62.07		359.96	-20.25		326.47	13.01		329.06	-395.29		203.39
n+3	199.99		519.24	108.18		440.84	159.26		431.65	-360.71		235.48
n+4	340.67		657.87	158.56		565.18	196.53		546.46	-387.14		328.33
n+5	360.15		809.95	121.63		676.56	164.13		646.53	-495.72		401.81
n+6	349.43		955.82	107.61		784.51	81.65		770.11	-602.82		468.40
F-statistic	2.48	0.65		0.34	0.85		0.31	0.87		1.00	0.42	
Observations		600			600			600			600	
States		50			50			50			50	
Includes Unemployment Rates?		no			no			yes			yes	
Includes Population?		no			no			no			yes	
Includes Year Effects?		no			yes			yes			yes	
Includes State Effects?		no			yes			yes			yes	

Note: *p < .05. **p < .01. ***p < .001. This table displays the outcomes of the event study analyses. It shows the year-to-year changes in the number of degrees awarded pre- and post-treatment. I clustered the standard errors at the state level.

Table 20.

Event Study Outcomes – Total Stem Degrees at Public Institutions.

	STEM			Add Fixed Effects			Add Unemployment Rates			Add Population		
	β	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE
Public Institutions												
n-5	-130.72		278.13	-101.25		311.56	-249.70		307.55	440.57		265.41
n-4	-35.83		187.28	-32.87		216.58	-171.07		223.15	392.07		226.66
n-3	-148.30		137.33	-114.22		155.29	-216.04		191.85	133.06		150.26
n-2	22.42		86.51	60.09		113.01	3.41		115.21	187.19	*	82.65
n-1 (Reference)	—		—	—		—	—		—	—		—
n	-64.55		177.07	-65.54		133.60	-87.98		151.34	-263.67	*	111.37
n+1	23.83		291.68	-3.42		230.95	11.93		234.76	-333.17		185.63
n+2	135.51		424.30	35.10		370.03	72.07		365.91	-448.02	*	207.77
n+3	321.71		647.48	201.90		549.82	258.68		533.92	-403.65		292.01
n+4	729.36		812.41	512.52		677.72	554.72		653.01	-188.75		304.70
n+5	885.13		1001.59	630.79		817.16	678.04		781.98	-162.47		407.08
n+6	1030.40		1159.57	740.58		934.46	711.72		920.57	-160.15		433.59
F-statistic	4.27	0.37		1.37	0.26		1.34	0.27		1.78	0.15	
Observations		600			600			600			600	
States		50			50			50			50	
Includes Unemployment Rates?		no			no			yes			yes	
Includes Population?		no			no			no			yes	
Includes Year Effects?		no			yes			yes			yes	
Includes State Effects?		no			yes			yes			yes	

Note: *p < .05. **p < .01. ***p < .001. This table displays the outcomes of the event study analyses. It shows the year-to-year changes in the number of degrees awarded pre- and post-treatment. I clustered the standard errors at the state level.

Table 21.

Event Study Outcomes – Total Black Stem Degrees at Public Institutions.

	BLACK			Add Fixed Effects			Add Unemployment			Add Population		
	β	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE
Public Institutions												
n-5	-66.48		41.71	-84.71		56.14	-65.99		48.46	-19.23		44.24
n-4	-33.65		23.43	-52.97		37.22	-35.55		32.78	2.60		27.58
n-3	-45.64	*	17.78	-64.84		32.99	-52.00		29.50	-28.35		28.37
n-2	1.13		18.22	-15.12		33.59	-7.97		31.40	4.48		30.01
n-1 (Reference)	—		—	—		—	—		—	—		—
n	100.75		52.65	58.65		41.72	61.48		40.73	49.58		37.92
n+1	-33.17		101.63	-5.34		88.57	-7.28		88.30	-30.65		98.78
n+2	55.92		71.74	26.17		55.00	21.50		54.58	-13.73		38.85
n+3	94.99		101.55	57.92		84.48	50.76		84.07	5.89		69.18
n+4	134.08		119.44	111.74		98.73	106.42		99.30	56.05		77.77
n+5	243.58		156.92	180.55		120.85	174.60		120.50	117.66		113.09
n+6	-4.23		223.91	-89.95		198.56	-86.31		191.45	-145.37		186.47
F-statistic	7.85	0.10		1.13	0.36		0.89	0.48		0.94	0.45	
Observations		600			600			600			600	
States		50			50			50			50	
Includes Unemployment Rates?		no			no			yes			yes	
Includes Population?		no			no			no			yes	
Includes Year Effects?		no			yes			yes			yes	
Includes State Effects?		no			yes			yes			yes	

Note: *p < .05. **p < .01. ***p < .001. This table displays the outcomes of the event study analyses. It shows the year-to-year changes in the number of degrees awarded pre- and post-treatment. I clustered the standard errors at the state level.

Table 23.

Event Study Outcomes – Total Women Stem Degrees at Public Institutions.

	WOMEN			Add Fixed Effects			Add Unemployment			Add Population		
	β	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE
Public Institutions												
n-5	-86.07		158.48	-76.25		191.03	-157.25		192.03	258.72		151.63
n-4	-56.82		115.31	-59.97		134.73	-135.38		139.61	203.98		125.86
n-3	-114.77		73.75	-103.35		91.55	-158.91		112.44	51.46		87.46
n-2	-6.81		42.88	9.96		65.22	-20.96		68.61	89.78		49.25
n-1 (Reference)	—		—	—		—	—		—	—		—
n	-18.27		102.13	-21.13		75.83	-33.37		87.23	-139.25	*	56.71
n+1	42.43		166.83	25.43		135.74	33.81		140.50	-174.15		99.73
n+2	113.80		250.63	64.07		223.19	84.24		220.69	-229.17	*	112.05
n+3	292.16		387.08	234.80		333.89	265.78		325.55	-133.34		158.84
n+4	477.82		477.83	363.58		404.89	386.60		392.21	-61.42		169.27
n+5	588.43		584.23	460.03		483.94	485.81		465.31	-20.69		224.30
n+6	655.37		679.82	503.85		555.83	488.10		549.30	-37.30		235.05
F-statistic	4.22	0.38		1.08	0.37		1.01	0.41		1.81	0.14	
Observations		600			600			600			600	
States		50			50			50			50	
Includes Unemployment Rates?		no			no			yes			yes	
Includes Population?		no			no			no			yes	
Includes Year Effects?		no			yes			yes			yes	
Includes State Effects?		no			yes			yes			yes	

Note: *p < .05. **p < .01. ***p < .001. This table displays the outcomes of the event study analyses. It shows the year-to-year changes in the number of degrees awarded pre- and post-treatment. I clustered the standard errors at the state level.

Table 22.

Event Study Outcomes – Total Hispanic Stem Degrees at Public Institutions.

	HISPANIC			Add Fixed Effects			Add Unemployment			Add Population		
	β	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE
Public Institutions												
n-5	-78.45		59.43	-121.97		104.41	-99.80		94.29	64.52		79.30
n-4	-29.28		24.84	-77.13		67.99	-56.49		60.42	77.57		70.49
n-3	-25.78		32.22	-71.82		55.33	-56.61		48.50	26.49		45.61
n-2	24.42		34.44	-20.59		61.93	-12.13		59.06	31.62		53.62
n-1 (Reference)	—		—	—		—	—		—	—		—
n	115.21		94.83	20.90		63.80	24.25		62.98	-17.57		64.95
n+1	-165.83		175.18	-131.91		172.57	-134.20		173.10	-216.35		236.61
n+2	186.51		179.27	110.31		119.67	104.79		118.47	-19.02		41.17
n+3	251.39		234.48	169.17		177.31	160.69		175.55	3.02		78.39
n+4	335.95		300.34	289.44		230.50	283.14		230.87	106.15		90.91
n+5	668.39		392.73	528.10		310.06	521.05		307.53	320.96		242.22
n+6	181.91		454.66	-1.16		347.79	3.15		347.23	-204.40		213.63
F-statistic	2.25	0.69		0.51	0.73		0.42	0.79		0.41	0.80	
Observations		600			600			600			600	
States		50			50			50			50	
Includes Unemployment Rates?		no			no			yes			yes	
Includes Population?		no			no			no			yes	
Includes Year Effects?		no			yes			yes			yes	
Includes State Effects?		no			yes			yes			yes	

Note: *p < .05. **p < .01. ***p < .001. This table displays the outcomes of the event study analyses. It shows the year-to-year changes in the number of degrees awarded pre- and post-treatment. I clustered the standard errors at the state level.

Table 24.

Event Study Outcomes – Total Stem Degrees at Private Institutions.

	STEM			Add Fixed Effects			Add Unemployment Rates			Add Population		
	β	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE
Private Institutions												
n-5	27.94		110.51	55.18		156.33	-16.79		177.07	171.78		160.35
n-4	60.07		91.58	81.84		114.39	14.85		134.24	168.69		111.72
n-3	48.32		94.38	73.21		93.41	23.85		116.17	119.22		96.41
n-2	-41.30		66.82	-21.48		53.37	-48.96		66.35	1.25		56.92
n-1 (Reference)	—		—	—		—	—		—	—		—
n	65.10		92.04	78.26		61.78	67.39		70.70	19.39		55.35
n+1	7.34		169.55	0.17		144.52	7.61		150.87	-86.67		118.55
n+2	-10.61		216.74	-63.45		205.42	-45.53		213.26	-187.61		175.15
n+3	-128.38		304.46	-176.42		277.38	-148.89		276.79	-329.83		231.15
n+4	-136.79		379.96	-238.88		380.03	-218.42		374.67	-421.52		330.65
n+5	-204.46		450.37	-362.17		456.50	-339.27		445.28	-568.88		392.80
n+6	-314.53		513.36	-444.17		496.92	-458.16		490.37	-696.34		437.58
F-statistic	3.87	0.42		0.87	0.49		0.72	0.58		1.30	0.28	
Observations		600			600			600			600	
States		50			50			50			50	
Includes Unemployment Rates?		no			no			yes			yes	
Includes Population?		no			no			no			yes	
Includes Year Effects?		no			yes			yes			yes	
Includes State Effects?		no			yes			yes			yes	

Note: *p < .05. **p < .01. ***p < .001. This table displays the outcomes of the event study analyses. It shows the year-to-year changes in the number of degrees awarded pre- and post-treatment. I clustered the standard errors at the state level.

Table 25.

Event Study Outcomes – Total Black Stem Degrees at Private Institutions.

	BLACK			Add Fixed Effects			Add Unemployment			Add Population		
	β	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE
Private Institutions												
n-5	8.75		21.10	4.94		28.55	-1.14		30.98	24.19		25.32
n-4	19.82		16.20	14.88		20.56	9.22		23.11	29.88		19.03
n-3	19.76		18.19	15.20		19.17	11.03		21.65	23.84		18.74
n-2	16.06		18.56	14.48		22.67	12.16		23.83	18.90		22.68
n-1 (Reference)	—		—	—		—	—		—	—		—
n	7.60		29.68	-4.35		20.58	-5.27		21.06	-11.72		20.43
n+1	17.60		37.26	35.66		28.91	36.29		29.04	23.63		26.18
n+2	-4.06		43.03	-19.16		35.41	-17.65		35.69	-36.73		29.81
n+3	-16.28		52.35	-34.82		39.22	-32.50		38.94	-56.80		33.90
n+4	15.78		63.27	2.17		53.11	3.90		52.61	-23.38		47.92
n+5	-10.28		71.36	-50.64		57.65	-48.70		56.32	-79.54		50.34
n+6	-43.43		78.51	-76.88		65.38	-78.06		65.88	-110.05		60.60
F-statistic	2.65	0.62		0.50	0.74		0.36	0.84		0.84	0.51	
Observations		600			600			600			600	
States		50			50			50			50	
Includes Unemployment Rates?		no			no			yes			yes	
Includes Population?		no			no			no			yes	
Includes Year Effects?		no			yes			yes			yes	
Includes State Effects?		no			yes			yes			yes	

Note: *p < .05. **p < .01. ***p < .001. This table displays the outcomes of the event study analyses. It shows the year-to-year changes in the number of degrees awarded pre- and post-treatment. I clustered the standard errors at the state level.

Table 26.

Event Study Outcomes – Total Hispanic Stem Degrees at Private Institutions.

	HISPANIC			Add Fixed Effects			Add Unemployment			Add Population		
	β	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE
Private Institutions												
n-5	2.77		9.70	-0.77		19.05	-1.36		18.48	33.66		24.55
n-4	0.26		7.72	-4.94		16.06	-5.49		15.55	23.08		18.58
n-3	-3.32		7.98	-6.70		11.12	-7.10		12.05	10.60		11.54
n-2	16.95		18.64	13.91		20.80	13.69		21.20	23.01		20.82
n-1 (Reference)	—		—	—		—	—		—	—		—
n	23.78		22.49	11.52		13.47	11.43		13.94	2.51		11.14
n+1	-20.29		27.23	-11.00		21.24	-10.94		21.24	-28.45		25.33
n+2	25.43		38.35	10.64		30.75	10.79		30.21	-15.59		20.79
n+3	22.09		55.20	8.01		46.56	8.24		45.63	-25.36		32.90
n+4	37.28		64.95	26.91		58.06	27.08		57.47	-10.64		42.07
n+5	76.03		80.14	43.20		71.09	43.39		70.65	0.75		55.46
n+6	-6.89		96.28	-42.58		81.79	-42.70		82.46	-86.93		69.19
F-statistic	2.66	0.62		0.63	0.64		0.59	0.67		0.61	0.66	
Observations		600			600			600			600	
States		50			50			50			50	
Includes Unemployment Rates?		no			no			yes			yes	
Includes Population?		no			no			no			yes	
Includes Year Effects?		no			yes			yes			yes	
Includes State Effects?		no			yes			yes			yes	

Note: *p < .05. **p < .01. ***p < .001. This table displays the outcomes of the event study analyses. It shows the year-to-year changes in the number of degrees awarded pre- and post-treatment. I clustered the standard errors at the state level.

Table 27.

Event Study Outcomes – Total Women Stem Degrees at Private Institutions.

	WOMEN			Add Fixed Effects			Add Unemployment			Add Population		
	β	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE
Private Institutions												
n-5	-12.25		88.62	8.75		126.64	-43.79		136.91	82.15		125.23
n-4	26.90		50.59	44.29		87.79	-4.61		97.22	98.13		85.10
n-3	30.88		46.62	45.87		61.67	9.83		73.93	73.52		62.48
n-2	-19.91		37.36	-10.62		37.57	-30.67		45.78	2.86		40.85
n-1 (Reference)	—		—	—		—	—		—	—		—
n	31.38		72.29	43.53		41.85	35.59		48.89	3.54		41.18
n+1	1.81		129.23	3.09		108.74	8.52		112.48	-54.44		93.72
n+2	-54.90		161.74	-84.31		153.32	-71.23		157.43	-166.12		135.33
n+3	-95.34		210.21	-126.62		192.58	-106.52		190.93	-227.36		159.97
n+4	-140.33		260.29	-205.01		258.30	-190.08		252.86	-325.72		226.15
n+5	-231.46		315.29	-338.41		313.12	-321.69		303.79	-475.04		273.92
n+6	-309.11		366.02	-396.24		347.19	-406.46		342.98	-565.53		311.56
F-statistic	5.89	0.21		1.49	0.22		0.91	0.47		1.92	0.12	
Observations		600			600			600			600	
States		50			50			50			50	
Includes Unemployment Rates?		no			no			yes			yes	
Includes Population?		no			no			no			yes	
Includes Year Effects?		no			yes			yes			yes	
Includes State Effects?		no			yes			yes			yes	

Note: *p < .05. **p < .01. ***p < .001. This table displays the outcomes of the event study analyses. It shows the year-to-year changes in the number of degrees awarded pre- and post-treatment. I clustered the standard errors at the state level.

Table 28.

Event Study Outcomes – Share of Black Stem Degrees at All Institutions.

	BLACK			Add Fixed Effects			Add Unemployment			Add Population		
	β	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE
All Institutions												
n-5	-0.18%		0.31%	-0.25%		0.30%	-0.15%		0.27%	-0.12%		0.28%
n-4	0.18%		0.23%	0.06%		0.22%	0.15%		0.21%	0.17%		0.21%
n-3	0.08%		0.24%	-0.01%		0.25%	0.06%		0.25%	0.07%		0.25%
n-2	-0.05%		0.24%	-0.07%		0.27%	-0.03%		0.26%	-0.02%		0.26%
n-1 (Reference)	—		—	—		—	—		—	—		—
n	0.37%		0.44%	0.25%		0.31%	0.27%		0.30%	0.26%		0.30%
n+1	-0.12%		0.50%	0.33%		0.39%	0.32%		0.39%	0.31%		0.40%
n+2	-0.43%		0.40%	-0.44%		0.41%	-0.47%		0.41%	-0.49%		0.43%
n+3	-0.15%		0.35%	-0.23%		0.40%	-0.27%		0.40%	-0.30%		0.42%
n+4	-0.06%		0.43%	0.05%		0.45%	0.02%		0.46%	-0.02%		0.47%
n+5	-0.06%		0.45%	-0.27%		0.29%	-0.30%		0.29%	-0.34%		0.31%
n+6	-0.93%		0.88%	-1.14%		0.75%	-1.12%		0.72%	-1.16%		0.73%
F-statistic	6.12	0.19		1.29	0.29		1.50	0.22		1.60	0.19	
Observations		600			600			600			600	
States		50			50			50			50	
Includes Unemployment Rates?		no			no			yes			yes	
Includes Population?		no			no			no			yes	
Includes Year Effects?		no			yes			yes			yes	
Includes State Effects?		no			yes			yes			yes	

Note: *p < .05. **p < .01. ***p < .001. This table displays the outcomes of the event study analyses. It shows the year-to-year changes in the share of degrees awarded pre- and post-treatment. I clustered the standard errors at the state level.

Table 29.

Event Study Outcomes – Share of Hispanic Stem Degrees at All Institutions.

	HISPANIC			Add Fixed Effects			Add Unemployment			Add Population		
	β	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE
All Institutions												
n-5	-0.57%		0.39%	-0.84%	*	0.33%	-0.83%	*	0.36%	-0.78%	*	0.36%
n-4	-0.40%		0.33%	-0.64%	*	0.28%	-0.63%	*	0.30%	-0.59%		0.31%
n-3	-0.44%		0.39%	-0.71%	*	0.33%	-0.70%	*	0.35%	-0.67%		0.35%
n-2	-0.24%		0.38%	-0.48%		0.25%	-0.47%		0.27%	-0.46%		0.28%
n-1 (Reference)	—		—	—		—	—		—	—		—
n	0.37%		0.23%	-0.06%		0.29%	-0.06%		0.29%	-0.07%		0.29%
n+1	-1.60%		1.09%	-1.42%		0.97%	-1.43%		0.97%	-1.45%		0.98%
n+2	0.51%		0.37%	0.14%		0.18%	0.14%		0.19%	0.10%		0.17%
n+3	0.59%		0.44%	0.21%		0.32%	0.20%		0.32%	0.16%		0.30%
n+4	0.75%		0.44%	0.52%		0.32%	0.52%		0.32%	0.47%		0.31%
n+5	1.57%	*	0.66%	0.93%		0.46%	0.93%	*	0.46%	0.87%		0.48%
n+6	0.17%		1.14%	-0.55%		0.83%	-0.54%		0.82%	-0.61%		0.80%
F-statistic	2.46	0.65		1.74	0.16		1.39	0.25		1.24	0.31	
Observations		600			600			600			600	
States		50			50			50			50	
Includes Unemployment Rates?		no			no			yes			yes	
Includes Population?		no			no			no			yes	
Includes Year Effects?		no			yes			yes			yes	
Includes State Effects?		no			yes			yes			yes	

Note: *p < .05. **p < .01. ***p < .001. This table displays the outcomes of the event study analyses. It shows the year-to-year changes in the share of degrees awarded pre- and post-treatment. I clustered the standard errors at the state level.

Table 30.

Event Study Outcomes – Share of Women Stem Degrees at All Institutions.

	WOMEN			Add Fixed Effects			Add Unemployment			Add Population		
	β	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE
All Institutions												
n-5	-0.07%		0.83%	-0.37%		0.58%	-0.37%		0.58%	-0.32%		0.59%
n-4	-0.25%		0.69%	-0.49%		0.63%	-0.49%		0.63%	-0.45%		0.64%
n-3	-0.13%		0.52%	-0.40%		0.46%	-0.40%		0.45%	-0.38%		0.46%
n-2	-0.04%		0.44%	-0.16%		0.43%	-0.16%		0.42%	-0.14%		0.42%
n-1 (Reference)	—		—	—		—	—		—	—		—
n	-0.49%		0.46%	-0.51%		0.48%	-0.51%		0.47%	-0.53%		0.48%
n+1	-0.11%		0.56%	-0.10%		0.60%	-0.10%		0.60%	-0.13%		0.61%
n+2	-0.43%		0.49%	-0.37%		0.56%	-0.37%		0.56%	-0.41%		0.56%
n+3	0.39%		0.65%	0.42%		0.73%	0.42%		0.74%	0.38%		0.74%
n+4	-0.16%		0.63%	-0.11%		0.65%	-0.11%		0.65%	-0.16%		0.65%
n+5	-0.36%		0.69%	-0.33%		0.71%	-0.33%		0.71%	-0.38%		0.73%
n+6	-0.54%		0.76%	-0.39%		0.75%	-0.39%		0.75%	-0.45%		0.76%
F-statistic	0.40	0.98		0.30	0.88		0.29	0.88		0.26	0.90	
Observations		600			600			600			600	
States		50			50			50			50	
Includes Unemployment Rates?		no			no			yes			yes	
Includes Population?		no			no			no			yes	
Includes Year Effects?		no			yes			yes			yes	
Includes State Effects?		no			yes			yes			yes	

Note: *p < .05. **p < .01. ***p < .001. This table displays the outcomes of the event study analyses. It shows the year-to-year changes in the share of degrees awarded pre- and post-treatment. I clustered the standard errors at the state level.

Table 31.

Event Study Outcomes – Share of Black Stem Degrees at Public Institutions.

	BLACK			Add Fixed Effects			Add Unemployment			Add Population		
	β	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE
Public Institutions												
n-5	-0.37%		0.27%	-0.44%		0.27%	-0.33%		0.24%	-0.34%		0.26%
n-4	-0.06%		0.19%	-0.16%		0.21%	-0.07%		0.20%	-0.07%		0.21%
n-3	-0.26%		0.22%	-0.33%		0.26%	-0.26%		0.27%	-0.26%		0.27%
n-2	-0.13%		0.20%	-0.16%		0.23%	-0.12%		0.22%	-0.12%		0.22%
n-1 (Reference)	—		—	—		—	—		—	—		—
n	0.56%		0.34%	0.44%		0.32%	0.46%		0.31%	0.46%		0.31%
n+1	-0.24%		0.51%	0.11%		0.40%	0.10%		0.41%	0.10%		0.42%
n+2	-0.27%		0.34%	-0.29%		0.33%	-0.32%		0.34%	-0.32%		0.35%
n+3	0.04%		0.33%	0.01%		0.35%	-0.03%		0.37%	-0.02%		0.38%
n+4	-0.16%		0.35%	-0.05%		0.39%	-0.08%		0.40%	-0.08%		0.41%
n+5	0.19%		0.40%	0.06%		0.30%	0.03%		0.31%	0.04%		0.31%
n+6	-1.00%		1.00%	-1.18%		0.90%	-1.16%		0.86%	-1.15%		0.84%
F-statistic	4.74	0.31		0.95	0.44		0.95	0.44		0.92	0.46	
Observations		600			600			600			600	
States		50			50			50			50	
Includes Unemployment Rates?		no			no			yes			yes	
Includes Population?		no			no			no			yes	
Includes Year Effects?		no			yes			yes			yes	
Includes State Effects?		no			yes			yes			yes	

Note: *p < .05. **p < .01. ***p < .001. This table displays the outcomes of the event study analyses. It shows the year-to-year changes in the share of degrees awarded pre- and post-treatment. I clustered the standard errors at the state level.

Table 32.

Event Study Outcomes – Share of Hispanic Stem Degrees at Public Institutions.

	HISPANIC			Add Fixed Effects			Add Unemployment			Add Population		
	β	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE
Public Institutions												
n-5	-0.46%		0.41%	-0.78%	*	0.35%	-0.74%		0.37%	-0.68%		0.37%
n-4	-0.31%		0.31%	-0.59%	*	0.25%	-0.55%		0.28%	-0.50%		0.29%
n-3	-0.26%		0.38%	-0.57%		0.32%	-0.54%		0.35%	-0.51%		0.35%
n-2	-0.33%		0.48%	-0.62%		0.35%	-0.60%		0.37%	-0.58%		0.38%
n-1 (Reference)	—		—	—		—	—		—	—		—
n	0.44%		0.25%	-0.04%		0.34%	-0.03%		0.35%	-0.05%		0.34%
n+1	-1.50%		1.10%	-1.36%		0.99%	-1.37%		0.98%	-1.40%		1.00%
n+2	0.63%		0.38%	0.20%		0.18%	0.19%		0.18%	0.14%		0.16%
n+3	0.78%		0.47%	0.33%		0.33%	0.32%		0.33%	0.26%		0.31%
n+4	0.84%		0.50%	0.53%		0.36%	0.52%		0.36%	0.45%		0.35%
n+5	1.67%	*	0.75%	0.96%		0.54%	0.95%		0.54%	0.87%		0.58%
n+6	0.02%		1.24%	-0.76%		0.93%	-0.76%		0.91%	-0.84%		0.89%
F-statistic	2.29	0.68		1.61	0.19		1.22	0.31		1.02	0.41	
Observations		600			600			600			600	
States		50			50			50			50	
Includes Unemployment Rates?		no			no			yes			yes	
Includes Population?		no			no			no			yes	
Includes Year Effects?		no			yes			yes			yes	
Includes State Effects?		no			yes			yes			yes	

Note: *p < .05. **p < .01. ***p < .001. This table displays the outcomes of the event study analyses. It shows the year-to-year changes in the share of degrees awarded pre- and post-treatment. I clustered the standard errors at the state level.

Table 33.

Event Study Outcomes – Share of Women Stem Degrees at Public Institutions.

	WOMEN			Add Fixed Effects			Add Unemployment			Add Population		
	β	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE
Public Institutions												
n-5	0.08%		0.82%	-0.27%		0.63%	-0.24%		0.62%	-0.21%		0.63%
n-4	-0.36%		0.69%	-0.65%		0.70%	-0.62%		0.69%	-0.60%		0.70%
n-3	-0.24%		0.59%	-0.54%		0.58%	-0.52%		0.57%	-0.51%		0.57%
n-2	-0.19%		0.47%	-0.37%		0.51%	-0.36%		0.50%	-0.35%		0.50%
n-1 (Reference)	—		—	—		—	—		—	—		—
n	-0.35%		0.54%	-0.48%		0.57%	-0.47%		0.57%	-0.48%		0.57%
n+1	0.28%		0.53%	0.19%		0.53%	0.19%		0.53%	0.17%		0.53%
n+2	0.15%		0.45%	0.17%		0.49%	0.16%		0.49%	0.14%		0.49%
n+3	0.93%		0.64%	0.98%		0.71%	0.97%		0.72%	0.94%		0.71%
n+4	0.58%		0.60%	0.60%		0.66%	0.59%		0.66%	0.56%		0.65%
n+5	0.76%		0.65%	0.87%		0.68%	0.86%		0.68%	0.83%		0.68%
n+6	0.64%		0.73%	0.80%		0.72%	0.81%		0.71%	0.77%		0.71%
F-statistic	1.20	0.88		0.45	0.78		0.43	0.43		0.43	0.79	
Observations		600			600			600			600	
States		50			50			50			50	
Includes Unemployment Rates?		no			no			yes			yes	
Includes Population?		no			no			no			yes	
Includes Year Effects?		no			yes			yes			yes	
Includes State Effects?		no			yes			yes			yes	

Note: *p < .05. **p < .01. ***p < .001. This table displays the outcomes of the event study analyses. It shows the year-to-year changes in the share of degrees awarded pre- and post-treatment. I clustered the standard errors at the state level.

Table 34.

Event Study Outcomes – Share of Black Stem Degrees at Private Institutions.

	BLACK			Add Fixed Effects			Add Unemployment			Add Population		
	β	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE
Private Institutions												
n-5	0.01%		0.84%	0.04%		0.73%	0.18%		0.69%	0.30%		0.67%
n-4	0.60%		0.66%	0.51%		0.50%	0.64%		0.46%	0.74%		0.47%
n-3	0.97%		0.72%	0.80%		0.60%	0.90%		0.59%	0.96%		0.59%
n-2	-0.12%		0.63%	0.00%		0.62%	0.05%		0.61%	0.08%		0.61%
n-1 (Reference)	—		—	—		—	—		—	—		—
n	-0.09%		1.16%	-0.26%		1.05%	-0.24%		1.05%	-0.27%		1.05%
n+1	0.28%		0.91%	1.27%		0.78%	1.25%		0.78%	1.18%		0.79%
n+2	-1.30%		0.87%	-1.22%		1.02%	-1.26%		1.03%	-1.35%		1.05%
n+3	-0.82%		0.58%	-0.84%		0.85%	-0.89%		0.84%	-1.01%		0.87%
n+4	1.13%		1.03%	1.42%		1.14%	1.38%		1.13%	1.25%		1.17%
n+5	-1.14%		0.99%	-1.60%		0.91%	-1.64%		0.92%	-1.79%		0.97%
n+6	0.54%		1.50%	0.16%		1.63%	0.18%		1.65%	0.03%		1.70%
F-statistic	5.68	0.22		0.89	0.48		1.04	0.40		1.13	0.36	
Observations		600			600			600			600	
States		50			50			50			50	
Includes Unemployment Rates?		no			no			yes			yes	
Includes Population?		no			no			no			yes	
Includes Year Effects?		no			yes			yes			yes	
Includes State Effects?		no			yes			yes			yes	

Note: *p < .05. **p < .01. ***p < .001. This table displays the outcomes of the event study analyses. It shows the year-to-year changes in the share of degrees awarded pre- and post-treatment. I clustered the standard errors at the state level.

Table 35.

Event Study Outcomes – Share of Hispanic Stem Degrees at Private Institutions.

	HISPANIC			Add Fixed Effects			Add Unemployment			Add Population		
	β	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE
Private Institutions												
n-5	-0.47%		0.74%	-0.91%		0.73%	-0.93%		0.83%	-0.92%		0.82%
n-4	0.72%		0.93%	0.26%		0.67%	0.23%		0.66%	0.24%		0.66%
n-3	0.20%		1.03%	-0.42%		0.78%	-0.44%		0.78%	-0.43%		0.78%
n-2	1.17%		0.88%	0.60%		0.59%	0.60%		0.59%	0.60%		0.58%
n-1 (Reference)	—		—	—		—	—		—	—		—
n	1.32%		1.00%	0.57%		0.61%	0.57%		0.61%	0.57%		0.61%
n+1	-2.28%		1.75%	-2.30%		1.72%	-2.30%		1.72%	-2.30%		1.72%
n+2	1.81%		1.83%	1.12%		1.42%	1.12%		1.43%	1.11%		1.44%
n+3	1.07%		1.01%	0.49%		0.69%	0.50%		0.70%	0.49%		0.70%
n+4	1.14%		0.72%	0.58%		0.47%	0.59%		0.47%	0.58%		0.46%
n+5	1.63%	*	0.80%	0.71%		0.48%	0.72%		0.48%	0.71%		0.46%
n+6	1.22%		1.13%	0.29%		0.72%	0.28%		0.71%	0.27%		0.69%
F-statistic	10.08	*		1.40	0.25		1.42	0.24		1.43	0.24	
Observations		600			600			600			600	
States		50			50			50			50	
Includes Unemployment Rates?		no			no			yes			yes	
Includes Population?		no			no			no			yes	
Includes Year Effects?		no			yes			yes			yes	
Includes State Effects?		no			yes			yes			yes	

Note: *p < .05. **p < .01. ***p < .001. This table displays the outcomes of the event study analyses. It shows the year-to-year changes in the share of degrees awarded pre- and post-treatment. I clustered the standard errors at the state level.

Table 36.

Event Study Outcomes – Share of Women Stem Degrees at Private Institutions.

	WOMEN			Add Fixed Effects			Add Unemployment			Add Population		
	β	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE
Private Institutions												
n-5	3.61%		4.59%	5.08%		4.95%	5.16%		5.07%	5.39%		5.09%
n-4	-0.06%		1.52%	1.52%		1.59%	1.59%		1.69%	1.78%		1.70%
n-3	0.01%		1.36%	1.67%		1.75%	1.73%		1.82%	1.84%		1.84%
n-2	1.12%		1.32%	3.13%		2.04%	3.16%		2.08%	3.22%		2.09%
n-1 (Reference)	—		—	—		—	—		—	—		—
n	-1.19%		1.93%	1.20%		2.72%	1.21%		2.74%	1.15%		2.74%
n+1	-1.03%		1.45%	1.02%		1.96%	1.00%		1.94%	0.89%		1.94%
n+2	-0.03%		2.29%	1.95%		2.94%	1.92%		2.90%	1.75%		2.88%
n+3	-0.64%		3.21%	1.45%		3.63%	1.42%		3.59%	1.20%		3.58%
n+4	-1.68%		2.95%	0.26%		3.48%	0.23%		3.44%	-0.01%		3.44%
n+5	-2.51%		2.59%	-0.52%		3.18%	-0.55%		3.14%	-0.83%		3.14%
n+6	-2.01%		1.99%	0.12%		2.56%	0.13%		2.61%	-0.15%		2.62%
F-statistic	1.56	0.82		0.78	0.54		0.77	0.55		0.78	0.54	
Observations		600			600			600			600	
States		50			50			50			50	
Includes Unemployment Rates?		no			no			yes			yes	
Includes Population?		no			no			no			yes	
Includes Year Effects?		no			yes			yes			yes	
Includes State Effects?		no			yes			yes			yes	

Note: *p < .05. **p < .01. ***p < .001. This table displays the outcomes of the event study analyses. It shows the year-to-year changes in the share of degrees awarded pre- and post-treatment. I clustered the standard errors at the state level.

Results

To explore the effects of CCB STEM programs on state-level STEM bachelor's degree attainment and composition, I employed a difference-in-differences (DiD) approach. I investigated two scenarios. I used a dummy variable (*POST*) to indicate the period before and after treatment in both setups, where zero represents before treatment, and one represents after treatment. In the first scenario, I applied a random treatment year to all control states to standardize the time variable and establish clear before and after treatment periods. I implemented this approach since the treatment years for CCB states vary (refer to Table 8 for treatment years). If there were only one treatment year, I could readily use that year to determine the post-treatment period. Yet, there are multiple years, so I randomly selected and applied one year to each state in the control group (refer to Table 9 for random year assignment). I removed all years beyond five years pre-treatment and six years post-treatment. This restriction adjusted the observations to 600 compared to the 1500 observations in the following setup.

In the second scenario, I did not standardize the time indicator or designate a post-treatment period for states in the control group. *POST*, in this model, does not ever take on a value of one for the control units. I use all available data in the analyses, including 50 states and 30 years of degree completion data for 1500 observations. To account for unobserved differences between states and within years, I included state and year fixed-effects. In addition, I used unemployment rates and population growth as covariates. Table 37 and Table 38 display the post-treatment outcomes of the models using a random treatment year. Table 39 and Table 40 demonstrate the findings of the post-treatment models that do not establish a post-treatment period for the control units.

Table 37.

Standardized Treatment Year – The State-Level Number of STEM Degrees Produced.

	Raw DiD			Add Fixed Effects			Add Un. RATES			Add Population		
	β	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE
STEM												
All	370.40		927.30	118.35		847.74	277.60		823.09	-913.45	*	426.10
Public	492.82		715.71	329.22		636.01	435.20		610.88	-506.81		267.03
Private	-122.42		296.47	-210.87		317.53	-157.60		314.93	-406.64		252.58
BLACK												
All	90.06		110.38	61.94		108.30	51.79		105.14	-45.48		83.03
Public	109.10		83.20	93.02		79.61	78.47		78.63	14.48		67.13
Private	-19.03		39.83	-31.08		43.65	-26.68		42.17	-59.95		33.30
HISPANIC												
All	252.53		224.89	207.17		207.38	189.41		197.76	-84.40		79.32
Public	234.83		190.07	200.64		172.64	182.69		164.37	-43.84		63.70
Private	17.71		46.77	6.53		49.01	6.72		47.52	-40.56		35.04
WOMEN												
All	239.26		563.42	102.48		529.35	198.40		513.88	-535.88		274.53
Public	357.85		418.69	278.42		380.47	335.93		367.19	-232.44		143.88
Private	-118.59		209.80	-175.95		228.16	-137.53		223.28	-303.43		185.82
Observations	600			600			600			600		
States	50			50			50			50		

Note: *p < .05. **p < .01. ***p < .001. This table displays the outcomes when the treatment year is standardized. It shows the relationship between CCB-implementation and four-year degree attainment. I clustered the standard errors at the state level.

Table 38.

Standardized Treatment Year – The State-Level Share of STEM Degrees Produced.

	Raw DiD			Add Fixed Effects			Add Un. Rates			Add Population		
	β	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE
BLACK												
All	-0.21%		0.34%	-0.15%		0.30%	-0.22%		0.30%	-0.26%		0.32%
Public	0.03%		0.34%	0.10%		0.31%	0.02%		0.33%	0.03%		0.34%
Private	-0.50%		0.76%	-0.43%		0.76%	-0.54%		0.76%	-0.69%		0.80%
HISPANIC												
All	0.61%		0.35%	0.50%	*	0.22%	0.49%	*	0.23%	0.40%		0.24%
Public	0.62%		0.40%	0.50%		0.27%	0.46%		0.28%	0.36%		0.30%
Private	0.41%		0.33%	0.30%		0.27%	0.31%		0.34%	0.28%		0.31%
WOMEN												
All	-0.16%		0.68%	0.09%		0.51%	0.08%		0.52%	0.02%		0.54%
Public	0.53%		0.61%	0.82%		0.44%	0.79%		0.45%	0.74%		0.44%
Private	-1.84%		1.47%	-1.52%		1.36%	-1.56%		1.29%	-1.81%		1.33%
Observations	600			600			600			600		
States	50			50			50			50		

Note: *p < .05. **p < .01. ***p < .001. This table displays the outcomes when the treatment year is standardized. It shows the relationship between CCB-implementation and the proportion of four-year STEM degrees awarded to various groups. I clustered the standard errors at the state level.

Table 39.

Unstandardized Treatment Year – The State-Level Number of STEM Degrees Produced.

		Raw DiD			Add Fixed Effects			Add Un. Rates			Add Population		
		β	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE
STEM													
	All	6239.20	*	2841.08	1395.97		1864.17	1385.95		1868.40	-1183.44		979.38
	Public	3631.12	*	1588.92	1491.49		1430.93	1476.60		1431.64	-545.25		577.51
	Private	2608.07		1445.68	-95.52		577.85	-90.65		576.88	-638.19		500.57
BLACK													
	All	672.85		349.59	281.79		255.23	288.20		255.14	43.57		157.47
	Public	462.56	*	227.87	281.99		190.99	285.06		190.74	117.93		126.37
	Private	210.29		132.99	-0.20		79.82	3.13		79.54	-74.36		57.74
HISPANIC													
	All	1159.43	*	493.00	601.30		617.39	567.01		619.49	-347.69		345.03
	Public	845.29	*	372.84	552.88		521.02	523.36		522.14	-246.66		272.66
	Private	314.13	*	150.89	48.43		114.53	43.65		115.02	-101.03		89.75
WOMEN													
	All	4002.60	*	1709.71	835.86		1200.71	830.59		1201.38	-803.63		656.15
	Public	2362.22	*	949.72	963.03		889.78	952.78		888.95	-296.64		345.96
	Private	1640.39		879.18	-127.17		420.79	-122.18		419.20	-506.99		375.03
Observations		1500			1500			1500			1500		
States		50			50			50			50		

Note: *p < .05. **p < .01. ***p < .001. This table displays the outcomes when the treatment year is unstandardized. It shows the relationship between CCB-implementation and four-year degree attainment. I clustered the standard errors at the state level.

Table 40.

Unstandardized Treatment Year – The State-Level Share of STEM Degrees Produced.

	Raw DiD			Add Fixed Effects			Add Un. Rates			Add Population		
	β	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE	**β**	Sig.	SE
BLACK												
All	0.03%		1.13%	-0.28%		0.32%	-0.26%		0.32%	-0.37%		0.34%
Public	0.39%		1.05%	0.02%		0.38%	0.05%		0.39%	-0.03%		0.39%
Private	-0.90%		1.72%	-0.72%		0.81%	-0.64%		0.83%	-0.89%		0.83%
HISPANIC												
All	2.45%	*	1.10%	1.69%	*	0.68%	1.69%	*	0.69%	1.02%		0.64%
Public	2.61%	*	1.22%	1.75%	*	0.75%	1.75%	*	0.75%	0.97%		0.68%
Private	2.09%	*	0.88%	1.29%		1.21%	1.27%		1.19%	0.97%		1.31%
WOMEN												
All	4.66%	***	0.79%	-0.14%		0.49%	-0.17%		0.49%	-0.21%		0.52%
Public	5.00%	***	0.86%	0.47%		0.49%	0.41%		0.51%	0.43%		0.51%
Private	1.65%		1.91%	-2.16%		1.67%	-2.01%		1.59%	-2.40%		1.69%
Observations	1500			1500			1500			1500		
States	50			50			50			50		

Note: *p < .05. **p < .01. ***p < .001. This table displays the outcomes when the treatment year is unstandardized. It shows the relationship between CCB-implementation and the proportion of four-year STEM degrees awarded to various groups. I clustered the standard errors at the state level.

I constructed four different models for each outcome variable to show how additions to the model affected estimates. Each table displaying the outcomes has a column for the unconditional DiD estimate, the addition of fixed effects, and each covariate separately. In addition to examining the total number and share of four-year STEM degrees at all institutions, I also explored heterogeneous effects based on institution type. I categorized the results for each outcome variable by institution type in the tables. All of the models used to determine the impact of CCB programs satisfied the parallel trends assumption. In the following paragraphs, I will first explain the estimates produced using a random treatment year to standardize the treatment year and establish a post-treatment period. Then I describe the results when the treatment year is not standardized.

Standardized Treatment Year

I investigated how CCB-implementation impacted the state-level number of STEM degrees using a standardized treatment year. I discovered that in the first year of possible CCB STEM graduates, STEM degree production dropped by approximately 900 degrees. This estimate was statistically significant. The model that produced this outcome encompassed fixed effects and both covariates. When I excluded population statistics from the model, the result changed to demonstrate an overall upward trend in STEM baccalaureate degree attainment after CCB-implementation, but it is not statistically significant. This change shows that population growth plays a major role in the magnitude of the effect.

Students of Color

I filtered the data by race to explore the effects of CCB programs on Black and Hispanic STEM graduates. While not statistically significant, the DiD estimate suggested a decline in degree production for Black and Hispanic students. The four-year STEM degree numbers decreased by about 45 Black graduates and approximately 84 Hispanic graduates. The reduction in degrees is evenly distributed between public and private institutions for Hispanic students, but all losses were at private institutions for Black students. I observed gains at public institutions for Black graduates.

The outcomes measuring the share of degrees awarded to Black and Hispanic students were not statistically significant but showed small positive effects for Hispanic students and mixed results for Black students. The proportion of Hispanic students earning a STEM degree increased at public and private institutions. Overall, the percentage of Hispanic graduates increased more than a third of a percentage point. The proportion of Black students at private

institutions was reduced by approximately one percentage point, and I observed a tiny percentage point change at public institutions (0.03%).

Women

I created a gender variable to explore the influence of CCB-implementation on the number of degrees awarded to women. The yields for women were not statistically significant, but they implied a negative effect. Degree production dropped by roughly 536 degrees for women. Almost 60 percent of this loss was due to reductions at private institutions.

Lag Analyses

The outcomes of the DiD fixed-effect models previously described produced a single effect for the entire post-treatment period. Therefore, I conducted lag analyses to see how these outcomes for public and private institutions would change from year to year for up to six years post-treatment. I present the results of the lag analyses in Table 16 to Table 36. Analyzing the lag outcomes for the STEM model, while statistical significance appears sporadically, I noticed that as the negative effects for degree numbers decrease in size at public institutions, they grow larger at private institutions. This finding is indicative of students shuffling from private institutions to public institutions.

Disaggregating the outcomes by race and gender, the year-to-year estimates for the number of degrees awarded to Black and Hispanic students oscillate between negative and positive values over time, while the outcomes maintain a negative value for women. None of these results are statistically significant. For women, an inverse relationship in degree production between public and private institutions is clear, but it is vaguer for Black and Hispanic students.

Regarding the share of degrees, there is no statistical significance detected in the conditional models. I observed a similar back and forth between positive and negative

coefficients for the students of color and negative values for women, as I described previously. Disaggregating the WOMEN model based on institution type, I detected no statistical significance, but the estimates suggest percentage point increases from year to year at public institutions.

Unstandardized Treatment Year

Unlike the model with the standardized treatment year, the unstandardized treatment year model produced an estimate for the impact of CCB programs on four-year STEM degree production that was not statistically significant. This model suggests that degree production decreased overall by nearly 1,200 STEM credentials. When I excluded fixed effects and covariates from the model, the outcomes imply a positive relationship between CCB-implementation and STEM bachelor's degree completion that is statistically significant. This unconditional estimate indicates an increase of about 6,200 degrees post-CCB implementation.

Students of Color

Filtering the data by race, the effects of CCB programs on Black and Hispanic STEM graduates move in opposite directions. This finding is in contrast to the outcomes produced using the standardized treatment year. While not statistically significant, these DiD estimates suggest a positive relationship between CCB programs and Black students and a negative relationship with Hispanic students. Here, the coefficient representing the number of degrees earned by Black students at public institutions is larger than the effect generated using the standardized treatment year; this makes the overall value positive even though I still detect losses at private institutions. For Hispanic students, the degrees are not as evenly distributed between public and private institutions as seen before. Nevertheless, the decline in degree production is due to losses at both institution types, as previously found.

Regarding degree composition, like the standardized treatment year models, the outcomes here show positive effects for Hispanic students and negative effects for Black students. I detected no statistical significance, however. The proportion of Hispanic students earning the STEM degree increased overall by one percentage point. The increase was about one percentage point at public and private institutions. Overall, the percentage of Hispanic graduates increased by more than a third of a percentage point. The share of degrees awarded to Black students decreased by more than a third of a percentage point, with the majority of the reduction due to losses at private institutions (-0.89%).

Women

Analogous with the previous results, I detected a reduction in the number of degrees awarded to women. According to the conditional model with the unstandardized treatment year, women earned 800 fewer degrees after CCB-implementation. In contrast to the model with the standardized treatment year, the overall percentage of degrees conferred to women dropped. While this estimate is not statistically significant, it suggests that the proportion of women decreased by a little less than a quarter of a percentage point (-0.21%). The determining factor was the loss of degrees at private institutions (-2.40%).

Summary

I approached the empirical exploration of this study in two ways. I used a standardized time indicator in the first approach and an unstandardized time indicator in the second. Overall, I observed mixed results for total degree production and no statistical significance elsewhere. The outcomes suggest a negative relationship between CCB-implementation and the overall number of four-year STEM degrees conferred at the state level. However, for students of color and

women, the estimates for the number and composition of STEM baccalaureate degrees produced post-treatment are not statistically different from that observed pre-treatment.

CHAPTER 5: DISCUSSION

The findings presented in this research add to the existing literature exploring the effects of community college baccalaureate (CCB) programs on state-level baccalaureate degree production (Daun-Barnett, 2011; Daun-Barnett, 2014; Park et al., 2018; Porter et al., 2014). Using a difference-in-differences (DiD) research design, this study compares states with enacted CCB policies, active CCB programs, and actual CCB STEM graduates to states lacking these characteristics. For this research, I used data from all degree-granting two-year and four-year public and private institutions across the U.S., encompassing all STEM degree completions between 1990 and 2019. This study sought to answer the following three research questions:

1. To what extent has CCB-implementation affected state-level STEM baccalaureate degree production?
2. To what extent has CCB-implementation affected state-level STEM baccalaureate degree production for Black and Hispanic students?
3. To what extent has CCB-implementation affected state-level STEM baccalaureate degree production for women?

The findings of this research provide very little evidence to suggest that CCB-implementation has affected four-year STEM degree attainment. The results for the overall number of four-year STEM degrees produced at the state level were mixed. I observed statistically significant effects with a standardized model and no significance with an unstandardized model. On the other hand, none of the disaggregated models examining the number of STEM degrees by race and gender were statistically significant. When I investigated whether the composition of degrees awarded had changed post-CCB implementation for Black,

Hispanic, and female students, these yields were not statistically significant either. I confirmed the robustness of all results with lead analyses and joint hypothesis tests.

Discussion of Results

In the following sections, I discuss the findings of this research in more detail. In particular, I make an effort to explain the lack of statistical significance previously mentioned. Then I present recommendations for members of state legislative bodies who govern policy changes. Lastly, I provide an overview of the extant literature and discuss topics for future research exploration.

Total Degree Production

First, I explored the impact of CCB-implementation on the total number of degrees produced at the state level. The results were mixed. One outcome indicated a negative relationship and the other no effect. However, I anticipated positive and statistically significant effects because community colleges lower the costs of STEM baccalaureate degrees. There are direct and indirect expenditures associated with earning a four-year degree. The direct expenses include tuition and fees, monies associated with purchasing books, and funds needed for travel. The indirect charges include time investments, delays in labor market entry, forgone income, sacrificed opportunities unrelated to education, and implicit biases (Banks, 1993; Becker, 1994; Contreras, 1990; Ladson-Billings, 1994; Toutkoushian & Paulsen, 2016). Becker's (1994) human capital theory suggests that when the benefits of the degree outweigh the degree's total costs, students will obtain more degrees. The chance to earn a four-year degree at a community college lessens the degree's direct and indirect costs.

Compared to attaining the four-year degree at a public four-year college/university, earning the degree at a community college is more affordable, more accessible, and more

achievable for particular student groups (AACC, 2018; Bemmel et al., 2008; Fain, 2013; Ma et al., 2018; USDE, 2017d). While underfunded, these two-year institutions, on average, are $5000 less per year than public four-year colleges and universities (Ma et al., 2018). They are generally open access, which relaxes the admission process compared to public four-year institutions (Bemmel et al., 2008). Furthermore, their proximal location makes these institutions a top choice for many place-bound students due to geographical constraints (ACE, 2016; Rouse, 2015). In addition, the racial diversity of the student and faculty population cultivates an environment conducive to learning and improvement in student success (Bargh, 1997; Egalite, 2015; Fairlie, 2014; Greenwald & Banaji, 1995; Gurin et al., 2002; King & Kitchener, 1994; King & Shuford, 1996; Langer, 1978; Paiget, 1971; Umbach, 2006). The opportunities for more one-on-one time with faculty and other staff for guidance, which is less likely at the four-year institution, contribute to a sense of belonging, validation, and support (Elliott & Lakin, 2021; Rendon, 1994). All of which increase persistence to baccalaureate degree completion.

Before CCB policies, the only route to the four-year degree for community college beginning students was through vertical transfer guided by articulation agreements. The present opportunity to earn a bachelor's degree at a community college offers an alternative to transfer pathways that have historically introduced unintentional barriers (Elliott & Lakin, 2021; Wang, 2020). Approximately 80 percent of students beginning at the community college express a desire to earn a baccalaureate degree; however, only a small percentage transfer, and less than 20 percent complete the degree (CCRC, 2020). Compared to lateral transfer students, community college-beginning students experience more cultural, social, and academic challenges post-transfer (Elliott & Lakin, 2021). In other words, vertical transfer students have a hard time adjusting to the norms of the four-year institution as they differ from the practices and expectations at the

community college. These students have to form new peer relationships, adapt to new campus infrastructure, and acclimate to new classroom dynamics and expectations. It's as if they are first-year students again. Without appropriate guidance, these students leak out of the higher education pipeline, specifically the STEM pipeline. The extant literature demonstrates that academic and social integration are essential to student persistence (Ellis, 2012; Tinto, 1993).

In particular, STEM students transferring to senior institutions endure more transfer shock than non-STEM students (Cejda, 1998; Lakin & Elliott, 2016). Furthermore, due to credit-transfer challenges, STEM students are more likely to experience transfer penalties such as degree completion delays. Allowing community college-beginning STEM students to attain the bachelor's degree at the community college eliminates the need to become accustomed to new academic expectations and develop new social networks halfway through their higher education journey.

The direct and indirect cost reductions associated with a community college education create a natural affinity that attracts nearly forty-two percent of all undergraduate students compared to about 35% at public four-year institutions (Ma, 2016). With a large proportion of the higher education student population attending community colleges, four-year STEM degree production growth was conceivable. However, my results did not corroborate this hypothesis. I present alternative explanations for the lack of statistical significance later in this chapter. Next, I discuss the outcomes of the analyses addressing my second research question.

Students of Color

My second question investigated the effects of CCB programs on Black and Hispanic students. In particular, these racial groups lag behind their White counterparts in attaining the four-year STEM credential (USDE, 2017b). There are many reasons why students of color earn

fewer degrees than white students, including the fact that they may not be interested in four-year degrees, or more specifically, STEM degrees. But also their ability to make rational decisions about pursuing higher education and the historical context surrounding higher education plays a role. Becker's (1994) human capital theory recognizes that a student's ability to conduct an adequate cost-benefit analysis depends on other factors, such as an individual's family background and geographical location. Students of color are more likely to come from underprivileged homes and communities. Households of lesser privilege may lack the knowledge or access necessary to weigh the benefits of investing in a four-year college education or the financial means required to forgo immediate income. However, a significant percentage of Black and Hispanic students seek higher education within their local communities. Roughly 56% of all Hispanic and 44% of all Black students are found at public two-year institutions compared to 29%, for each, at public four-year institutions. By offering four-year degree programs at community colleges, these students have the opportunity to complete a four-year degree regardless of their family background and geographical location.

The historical context behind higher education in the U.S partially plays a role in the STEM degree disparity between White students and students of color. At one point, academia was only available to the White, heterosexual, and Christian male (Pliner & Johnson, 2004). Therefore, the policies, practices, and structures of higher education systemically cater to this population. While organizational change is evident in the 21st century, implicit biases, microaggressions, and the lack of racial representation plague students of color, specifically in STEM degree programs (Blickenstaff, 2005; Grogan, 2018; NCES, 2008; Starobin & Laanan, 2008). Compared to their senior institutions, the community college mission allows these institutions to offer a culturally heterogeneous experience, presumably lessening the indirect

costs (i.e., implicit biases) associated with the four-year STEM degree. Community colleges are approximately 24 percent Hispanic, 13 percent Black, six percent Asian/Pacific Islander, three percent two or more races, two percent non-resident alien, and one percent Native American (AACC, 2018). Furthermore, 36 percent of students are first-generation, 17 percent are single parents, 12 percent are students with disabilities, seven percent have already obtained a baccalaureate degree, and four percent are military veterans (AACC, 2018). In addition, there are generational differences. The median age of students found in community colleges is 29, with the majority of the students falling between 18 and 24 (College Board; AACC, 2017). Cultural competence underscores differences among students and contributes to a more inclusive and equitable environment and a safe place for minoritized students to learn (Bargh, 1997; Epstein, 2006; Greenwald & Banaji; 1995; Gurin et al., 2002; King & Kitchener, 1994; King & Shuford, 1996; Langer, 1978; Paiget, 1971; Stewart & LaVaque-Manty, 2009). Not only do community colleges educate a diverse population of students (AACC, 2018), these public two-year institutions employ more Black and Hispanic faculty than public four-year institutions (NCES, 2008). Research shows that faculty of color are more likely to use a wide range of pedagogical strategies to accommodate the numerous learning styles existing among college students (Umbach, 2006).

Since cultural diversity characterizes community colleges, I assumed this would stimulate students of color to persist to degree completion (AACC, 2018; NCES, 2008). I expected the number and share of degrees awarded to Black and Hispanic students to increase. Yet, my findings show that STEM baccalaureate programs at community colleges have had no impact on degree production for these historically marginalized groups in the short term. In the next section, I discuss the findings relating to my third research question.

Women

My third research question asked about the impact of CCB programs on STEM degree attainment for women. In addition to the racial diversity of faculty members at community colleges, they also have a more significant proportion of female faculty members than public four-year institutions. Research suggests that the gender of faculty members matters in closing gender gaps in STEM (Solanki & Xu, 2018), which led me to believe that women would pursue more STEM baccalaureate degrees. Yet, even though CCB programs lower the cost of a bachelor's degree in STEM and have more student and faculty member gender and racial/ethnic diversity, my analyses determined that these programs did not influence STEM degree production for women either. In the subsequent section, I ponder other reasons for why my outcomes lacked statistical significance.

Alternative Explanations

Drawing from human capital theory, students invest in higher education as long as the costs do not outweigh the investment return (Becker, 1994). Given the mixed and not statistically significant effects, the results presented in this research reflect that the benefits of obtaining a four-year STEM degree at a community college are not more substantial than the investment. However, I offer five alternative explanations for why these were the outcomes of my research in the following paragraphs.

Stigma

My first explanation deals with the stigma surrounding community colleges. Despite the successes of community colleges, research shows that some people/students still view them as inferior institutions (Turk, 2019). Community colleges are commonly associated with little prestige, poor academic rigor, and fewer employment opportunities post-graduation (Barrington,

2019; Turk, 2019). James Wattenbarger, a self-proclaimed opponent of CCB, published his opinion about the quality of the CCB degree in an article titled *"Colleges Should Stick to What They Do Best,"* published in 2000. Wattenbarger states that "[i]t would be difficult, if not impossible, to convince anyone that the bachelor's offered by a community college is as important as the one offered by a university" (Wattenbarger, 2000, p. 4). While recent publications discredit this claim (Chen, 2019; Cominole, 2017), this quote brings to my attention that students may be misinformed about the outcomes of completing the four-year degree at the community college and do not consider this an equivalent pathway. Presumably, even though the cost of the STEM degree is higher at four-year institutions, these students may still choose to tackle the challenges of the transfer process (e.g., delays in degree completion) to obtain the degree from a traditional four-year college/university.

Major Choice

Students' choice of major is another possible reason for why I observed little to no effects. Goyette & Mullen (2006) did work on student preference of undergraduate field of study. This group reported that vocational areas are most popular among undergraduates, and Black and Hispanic students are more likely to choose vocational fields. Vocational programs such as the programs authorized at CCB institutions lead to specific jobs (e.g., nursing, IT, teaching). I included a wide variety of vocational STEM disciplines in this research. I provided a list of CIP codes in Table 5, Table 6, and Table 7. I also present the number of degrees conferred per state per CIP code in Appendix C. These data demonstrate that students are more concentrated in particular STEM disciplines. For example, institutions have awarded more degrees in the computer and biomedical sciences than in STEM education. Accordingly, I might have biased my results due to the inclusiveness of my study. Alternatively, students may be opting for non-

STEM majors. My research does not answer either of these questions, but future research should explore discipline-specific and non-STEM CCB degree production. I will talk more about future research later in the chapter.

National Scale

Along the same lines as the preceding rationalization, my outcomes might not be statistically significant due to the national span of my study. If I had investigated degree production and composition at the institutional level within individual states, I might have uncovered positive and significant outcomes. Toby Park (2018) reported a positive relationship between CCB implementation and teacher education degree production in Florida. The same might be true for STEM degrees based on the state and the magnitude of CCB implementation. In Appendix F, I present a graph of the total number of degrees conferred before and after the first class of CCB STEM graduates for all units included in the treatment group for this study. STEM degree production in states such as Florida appears to have increased post-CCB implementation. In other words, investigating local effects versus nationwide effects could bring about some interesting outcomes. I did not empirically explore this alternative. Therefore, this is another avenue for future research that I will elaborate on later in this chapter.

The Extent of CCB Implementation

The extent to which a state implemented CCB programs could have affected the results of this study. Previous researchers have highlighted that program capacity limits might be the culprit for the lack of statistical significance (Park et al., 2018). Eleven out of the 15 CCB states in the treatment group have less than three institutions offering the STEM baccalaureate degree. Consequently, they graduate fewer STEM students, except for Utah and New York. I have included a list of the institutions in Appendix A. I present the number of STEM degrees

conferred per state between 1990 and 2019 in Appendix C. With the existing nationwide shortage of bachelor's degrees in STEM, a limited number of institutions will not immediately overcome the scarcity of four-year STEM degrees in a state. Capacity limitations are an issue for many college programs, which in turn restricts student enrollment. In some states, policymakers justify CCB policies based on high student demand, low program existence, or limited capacity at four-year institutions (Love & Palmer, 2020). To face the same issues after CCB-adoption does little to resolve the STEM degree problem. Implementing CCB STEM programs on a small scale could mean that meaningful effects will not appear in the short term. For example, the chemical reactions that occur in our bodies would take a long time without the help of enzymes. One enzyme can break down multiple substrates, but the time required of one enzyme is much greater than having numerous enzymes at work simultaneously. Mass implementation may be required to reap immediate benefits with CCB programs.

Fixed Number of Undergraduates

Another reality might be that a set number of students are interested in pursuing a four-year STEM degree. The data I used allowed me to look beyond the treatment year for potential effects. To look at the results produced after the treatment year, I conducted lag analyses. I explored degree production for six years post-treatment, and while statistical significance does show up in some years, most of the estimates are still not statistically significant. However, I did recognize an interesting pattern in the lag outcomes, which could be related to the shuffling of students from private institutions to public institutions. While most of the yields were not statistically significant, the lag estimates suggested that as the deficiency in STEM degree production at public institutions decreases over time, the deficit at private institutions increases. This inverse relationship indicates that students might be withdrawing from private institutions

for similar four-year programs at more affordable public colleges, possibly community colleges with STEM baccalaureate programs. Kramer et al. (2020) previously reported a similar phenomenon. Specifically, Kramer et al. (2020) found that students migrated from for-profit private institutions to nearby CCB institutions.

Therefore, my fourth explanation aligns with a theory posed by Paulsen & Pogue (1988). This theory states that there is a fixed number of students interested in obtaining a four-year degree. My interpretation of this theory is that students cycle between public and private institutions, and the overall number of degrees remains the same over time. This implication suggests that the lack of statistically significant effects I observed in this study resulted from the number or share of degrees neither rising nor falling. Students are simply migrating from one institution type to another.

Bottleneck Effect

Contrary to Paulsen & Pogue (1988), I imagined a congested system for the last explanation. While students might be leaving private institutions, it is also possible that a new cluster of students (i.e., recent high school graduates, military veterans, place-bound students, etc.) are interested in pursuing the CCB STEM degree. Suppose all these students apply simultaneously, but the admission staff can only admit a fraction of these prospective students due to capacity limits. This scenario creates what's called a bottleneck effect. Presumably, these students are waiting their turn to move through the narrow opening of an old-fashioned Codd-neck soda bottle to gain admission to CCB STEM programs. The soda bottle in this example is used as a metaphor to describe program capacity limits at an insufficient number of CCB programs within a state that hinders the production of STEM credentials in the short term. This

congestion could be a possible explanation for the negative and not statistically significant effects presented in this research.

All in all, it appears that CCB programs are not increasing STEM bachelor's degree graduates. However, it is not clear whether other factors might be masking the effects of these programs. Based on the uncertainty of my outcomes, I offer considerations to state policymakers that support CCB programs and traditional baccalaureate degree programs in the following sections. I also offer recommendations for erasing the stigma associated with a community college education and for improving the K-12 teacher workforce to strengthen the STEM pipeline.

Considerations and Recommendations

Given the need to maintain global economic competitiveness, state and local policymakers are particularly interested in improving the STEM pipeline. The STEM workforce is vital to meeting the needs of rising globalization and advances in technology. The muscle and innovation of the STEM labor force are dependent on a heterogeneous pool of STEM candidates with diverse perspectives (Gurin et al., 2002; Moore & Continelli, 2016). Compared to the nation's demographics, Black, Hispanic, and female students are least represented among STEM baccalaureate degree holders (United States Census Bureau [USCB], 2019; United States Department of Education [USDE], 2017b), so targeting these populations might improve the strength of the STEM workforce. A sizeable number of students of color and women attend community colleges. Therefore, policies that focus on community colleges may increase the number of Black, Hispanic, and female students who pursue and persist to four-year STEM degree attainment. Historically, community college beginning students have needed to transfer to traditional four-year colleges and universities to complete the bachelor's degree. With the

enactment of CCB policies in various states, students can forgo baccalaureate transfer pathways and complete the four-year degree at select community colleges.

Unfortunately, no immediate effects have come from the implementation of CCB programs. Therefore, legislators should consider efforts that could strengthen the potential of CCB programs, but also ways to leverage structures and strategies that already exist at some public four-year institutions. In the following sections, I offer a few ways to bolster CCB programs. Additionally, I make suggestions for how to bridge the transfer gaps between community colleges and four-year institutions.

Mass Implementation

The small number of CCB programs in some states may not be enough. Seemingly, more than one program is necessary to produce a significant number of CCB STEM graduates. The extant literature reports positive outcomes in a state with more than three CCB institutions (Park et al., 2018). These findings indicate that although the U.S. has not achieved effects globally, local results are possible. Zooming in on individual states with numerous CCB institutions could help state governing bodies make more informed decisions about CCB authorization. To get a preliminary outlook on this hypothesis, I graphed the unconditional degree completion data used in this study by state (refer to Appendix F). I discovered an upward trend for Florida, Georgia, Texas, and Washington post-CCB implementation, suggesting an increase in STEM graduates. Each of these states has more than three CCB institutions. These preliminary outcomes indicate that states with a considerable number of CCB institutions and high student enrollment are reaping the benefits of CCB programs and that policymakers should consider mass implementation as a prerequisite.

Assisting Community College Leaders With Mass Implementation

While the potential benefits of CCB programs are great, the effort must be sustainable. With a robust execution of CCB programs comes an obligation to allocate a more substantial share of funds to community colleges. With state budget restraints, distributing more funds to community colleges could be problematic. Ortagus & Hu (2020) reported that community colleges have started to rely less on public funds and more on tuition and fees post-CCB-implementation. However, research shows that underrepresented students are sensitive to rises in tuition costs (Heller, 1999). The additional allocation of funding to community colleges is something for policymakers to consider.

While state policymakers approve the legislature for CCB authorization, the community college leaders do the work required to build and implement CCB programs, and that task is demanding. Streamlining this process is vital to extensive CCB-implementation. Establishing a CCB program requires many resources and physical labor from the implementing institution (Floyd & Arnauld, 2007; Mckinney & Moore, 2010; McKinney et al., 2012; McKinney et al., 2014). When adopting a CCB, community colleges must first obtain approval from the State Board of Education and submit a proposal to the regional accrediting agency (McKinney and Morris, 2010). Given the requirements, gaining the sanction of the State Board of Education and preparing the proposal is a long, drawn-out, and laborious process (McKinney and Morris, 2010). The regional accrediting agency requires the institution to have a set number of faculty who hold a terminal degree and adequate library resources that meet the needs of the proposed CCB program. Additionally, the community college task force must meet with representatives at regional four-year colleges and universities to defend their strategic plan for the CCB program. Given the demanding nature of CCB implementation, state legislators could aim to make the

process more desirable. For instance, community colleges pay thousands of dollars submitting proposals and visiting regional accrediting agencies (Filby, 2017). It could very well cost over $630,000 to establish one four-year degree program at the community college. Mitigating these costs or offering supplemental funds reduces the financial barriers for some community college leaders.

Bridging the Gap

While the future could reveal tangible outcomes for CCB STEM programs, the current findings suggest that thrusting efforts elsewhere may be a better approach. In states where CCB programs are ineffective or non-existent, I encourage efforts to bridge the cultural, social, and academic norm gaps for students who transfer from the community college. For example, in North Carolina (NC), a non-CCB state, partnerships between community colleges and six public four-year institutions within the University of North Carolina (UNC) system have yielded unique transfer pathways. The intention is to improve the 2 + 2 transfer model by addressing academic and social challenges (East Carolina University, 2021; North Carolina Agricultural and Technical State University, 2021; North Carolina State University, 2021; UNC-Chapel Hill, 2021; UNC Charlotte, 2021; UNC Wilmington, 2021). These institutions (programs) include North Carolina State University (Community College Collaboration, C3), East Carolina University (Pirate Promise), UNC Charlotte (49erNext), UNC Wilmington (Pathways to Excellence), UNC-Chapel Hill (Carolina Student Transfer Excellence Program, C-STEP), and North Carolina Agricultural and Technical State University (Aggie Plus). Their respective programs are available to students who come from low to moderate-income households. The services offered through these programs, such as being paired with an academic advisor and

receiving invitations to social gatherings and other events at the senior institutions, aim to enhance academic and social support.

Another approach is establishing more baccalaureate partnerships that allow community college students to complete the degree conferred by the university at the two-year institution. Wake Technical Community College (WTCC) in NC recently announced a partnership with East Carolina University to allow students to complete the requirements for four-year technology degrees on WTCC campuses (Wake Tech News, 2021). Developing or strengthening the previously mentioned pathways across the U.S. could encourage more students to seek bachelor's degrees. We should not expect students to be able to conform to unfamiliar norms independently. Transfer-receiving schools should be intentional in ensuring that their institutional policies, practices, and structures do not hinder academic and social integration.

Lack of Interest in Four-Year STEM Degrees

While there are many ways to strengthen existing structures in higher education, challenges in STEM education occur long before postsecondary education. The reality may be that students are not interested in STEM, specifically science, technology, and engineering, due to their lack of exposure to these subject areas at early ages (Eshach & Fried, 2005). This disinterest presumably stems from the lack of priority on science education during the early elementary school years (Brown, 2021; Eshach & Fried, 2005; Sackes et al., 2011). During the early K-5 years, teachers exert more effort teaching math and English since these content areas are linked to state-wide assessments. In the primary (and secondary) school realm, how students perform on math and English assessments reflects a teacher's effectiveness. Therefore, because science is not a tested subject, teachers spend less time focusing on the science curriculum, especially if the K-5 teacher does not hold a degree in a scientific discipline. "As such, their

memory of what constitutes science teaching is the high school chemistry, biology, and physics courses that they painfully, vividly remember" (Brown, 2021, p. 123). There is a saying that goes," a team is only as strong as its leader." If this is true, a teacher with limited knowledge or no interest in science unintentionally perpetuates the STEM problem. The students then carry this lack of exposure, narrow views, and depreciation for STEM to the middle and high schools, and the saga continues. Policies relevant to primary education should emphasize science education more in the early K-5 years to combat this scenario. Research shows that students exposed to quality science learning experiences at early ages have positive attitudes toward science, which is associated with subsequent improvements in science achievement (Eshach & Fried, 2005; Sackes et al., 2011). Therefore, legislators should consider how state-wide assessments exacerbate the STEM problem by placing unintended pressure on teachers to prove their ability to teach subjects other than science, technology, and engineering-related topics.

Another characteristic of the K-12 system that might deter students, specifically students of color, from STEM is the lack of racial representation in the teacher labor force. The percentage of Black (7%) and Hispanic (9%) teachers lag behind that of White teachers (80%) in public primary and secondary schools (USDE, 2016; NCES, 2019c). While I believe teachers, no matter their racial identity, are passionate about student learning and success, a workforce that lacks heterogeneity also lacks diverse perspectives and experiences vital to the teaching and learning process. Teachers should be equipped with the tools to teach the whole student and not just the subject content. Teaching the whole student is a collaborative effort that requires a culturally competent team that is responsive to all students. Cultural competence may be why minority students are more successful in classrooms and spaces populated by minority teachers

and staff members (Fairlie, 2014; Bargh, 1997; Greenwald & Banaji; 1995; Gurin et al., 2002; King & Kitchener, 1994; King & Shuford, 1996; Langer, 1978; Paiget, 1971).

The null effects presented in this paper suggest that STEM programs are not popular among four-year degree graduates. However, this lack of popularity may be due to instructional and cultural gaps in primary and secondary schools. Fortunately, we can remedy these differentials, but it will require a shift in how states rely on state-wide assessment data and the recruitment of culturally diverse teachers with degrees in STEM disciplines. However, the challenge of low wages associated with the teaching profession stands in the way. In particular, teachers' weekly earnings are 21.4 percent lower than their non-teaching peers (Garcia & Weiss, 2019). In addition to redefining the state-wide assessment process, state policymakers will need to consider heftier budget lines for teachers if they are committed to reducing the four-year STEM degree deficit.

Reducing Stigma

Increasing student exposure to and interest in STEM fields is necessary. However, high interest does not mean that students will choose the four-year degree program at the community college over transferring to the four-year institution. I previously mentioned the stigma surrounding community colleges and how many people deem them second-class institutions. Suppose students fail to consider community colleges among traditional four-year institutions when making decisions about higher education. In that case, CCB programs will do little to affect four-year STEM degree production. Changing this narrative, so that prospective students do not disregard community colleges as a viable and equivalent pathway to a four-year degree could make them more attractive. I provide three recommendations to reduce the community college stigma in the following paragraphs.

First, community college faculty and administrators can do more to advocate for themselves (Shaw et al., 2019). For instance, the expectations and rigor of coursework at the community college should be comparable to four-year institutions. While the opportunities for more one-on-one attention from faculty and other designated staff are prevalent at the community college, the instruction should be of the same standard as the four-year institution. At the department, division, or institutional level, administrators can initiate partnerships with local four-year institutions where faculty from each institution type can collaborate and construct better-aligned courses. Community college faculty and leadership could also reduce stigma by sharing the success stories of their alumni.

The second recommendation refers to the skepticism of some four-year faculty and administrators towards community college-beginning students (Shaw et al., 2019). This doubt interferes with the vertical transfer student's academic and social integration. Completing the associate's degree and successfully navigating the muddied channels of the transfer process should indicate that these students are highly motivated and intend to complete the bachelor's degree. Furthermore, research shows that the probability of a community college-transfer student attaining the bachelor's degree post-transfer is comparable to the native four-year student (Xu et al., 2018). Promoting more cross-college collaboration could reduce this uncertainty and perception of community colleges as inferior institutions and community college students as substandard.

Lastly, programs tasked with training high school counselors should be intentional in teaching future counselors to be objective when advising students on college pathways. Counselor training programs should also show future counselors how to help students use existing research to make more informed decisions. For example, recent scholarship illustrates

that community college graduates are just as likely to be employed as their four-year counterparts (Chen, 2019; Cominole, 2017). Collectively, these three recommendations could help to erase the negative perceptions that stigmatize a community college education.

Theoretical Implications

I used human capital theory to frame this work (Becker, 1994). This research is the first to apply this theory to explain the relationship between CCB programs and degree production. For this work, the belief is that students will invest in the four-year STEM degree as long as the benefits of completing the degree outweigh the costs. My analyses determined that even with the lower price of CCB STEM degrees, CCB-implementation has not increased four-year STEM degree production or composition in the short term. However, I still find this theory suitable for explaining the relationship between CCB-implementation and STEM degree production. The novel nature of CCB programs suggests that more time is needed to realize the full potential of these programs. Program capacity limits might be slowing the production of CCB STEM degrees, making it unclear whether or not students are taking advantage of these programs. If future explorations on the impact of CCB programs on degree production continue to yield null effects, then the theory on a fixed number of students interested in obtaining a degree, referred to in Paulsen & Pogue's 1988 study, might be a better fit for this association.

Paulsen & Pogues (1988) found that "colleges with an emphasis on traditional arts and sciences and teacher training programs tend to have greater enrollment growth when conditions in the [labor market] are improving. On the other hand, colleges with an emphasis on occupational fields tend to have greater enrollment growth when conditions the [labor market] are deteriorating (p.286). These findings imply that students shift from one institution type to another as the conditions of the labor market change. While enrollment growth may be apparent

at particular institutions, proliferation would not be evident overall. Between 1990 and 2019, the U.S. suffered grueling attacks on September 11, 2001, and the mortgage crisis during The Great Recession, which led to economic downturns. Outside of these devastating times, economic growth was evident. A stable economy would suggest that students are more likely to gravitate toward traditional four-year schools. However, with the introduction of CCB programs, these students might migrate to community colleges which would not affect the total number of four-year degrees. If privileged students who would usually attend the traditional public four-year institution shift to the community college, this would create competition for underprivileged students. With small program capacity limits, this could be problematic. While my study does not investigate students' movement from neighboring public four-year institutions to community colleges, Kramer et al. (2020) showed that CCB institutions do not detract from public four-year institutions. However, for-profit private institutions are experiencing enrollment declines (Kramer et al., 2020). Still, with students shifting from for-profit private institutions, total degree production will not increase.

Future Research Directions

Other studies have investigated the impact of CCB programs on nursing and teacher education degree production (Daun-Barnett, 2011; Daun-Barnett, 2014; Park et al., 2018; Porter et al., 2014). While the data for this study includes four-year nursing and teacher education degree completions, this research investigates the impact of CCB programs on the total number of four-year STEM degrees. This research represents the first exploration of CCB implementation and STEM baccalaureate degrees in this manner. Like the results reported in previous publications, this study presents little evidence that CCB programs affect STEM degree completion. Therefore, more research should be done to fully understand the impact of CCB

programs on STEM degree production. I offer some quantitative and qualitative research ideas in the following paragraphs.

Quantitative Research Ideas

Sample size and time have been recurring issues in the existing literature on CCB programs, and this study does not escape this challenge. In the future, researchers should use a DiD research design to reevaluate the outcomes presented in this dissertation. Exploring the relationship between CCB implementation and STEM bachelor's degrees later will allow the treatment group to encompass more CCB states (i.e., California), the production of more CCB STEM graduates, and an adequate number of post-treatment years for all treated states. Unfortunately, I had to exclude several states with active CCB policies because they have not had time to produce six years worth of CCB STEM graduates. With more CCB institutions at play, positive state-level effects are possible.

Synthetic Control Design

Future research employing a synthetic control method could also explore CCB degree production and composition at the institutional level within individual states. This research design uses matching and DiD techniques and relies on a comparison group constructed based on weights (Abadie, 2021). These weights assess the similarities between the treated and synthetic control states, such as enrollment outcomes. Explorations of individual states could unveil positive and significant effects such as the upward trends seen in Florida with Toby Park's (2018) work. A graph of the unconditional data used in this research, shown in Appendix F, suggests that at least four states have reaped the benefits of CCB programs. These states include Florida, Georgia, Texas, and Washington. In contrast to most other CCB states, these states have multiple CCB institutions. Florida alone has more than 25 CCB institutions.

Discipline-Specific

Investigators could also look at the impact on each STEM discipline separately. The NSF has constructed a widely accepted definition of STEM that includes the social and behavioral sciences (NSF, 2017; 2020). Some descriptions even rope in STEM education (Funk & Parker, 201). However, other classifications of STEM adhere to the natural sciences, technology-related fields, engineering, and mathematics. As a follow-up to this study, researchers could investigate heterogeneous effects produced based on these definitions. Glen & Glen (2003) discovered that community college students are more likely to choose vocational fields of study. While most of the four-year degree programs offered at community colleges are vocational, resulting in applied degrees, deciphering which program is most attractive is still a question. The existing literature has reported no effects for nursing and teacher education degree production (Daun-Barnett, 2011; Daun-Barnett, 2014; Park et al., 2018; Porter et al., 2014), but may require follow-up studies.

COVID-19 and Unemployment

The number of people choosing to quit their jobs in the U.S. amid the current COVID-19 pandemic is concerning. Usually, high unemployment would indicate a healthy economy; however, economic growth in the U.S., while in recovery, is lagging (Bureau of Economic Analysis (BEA), 2021; Horsley, 2020; Siegel & Dam, 2021). Resurgences of COVID-19 cases prolong state mandates and restrictions enforced to reduce human interaction and the transmission of COVID-19 infection, hindering economic improvement. This occurrence may present an interesting study. History shows that an unstable economy attracts prospective students to community colleges to increase their labor force marketability (Rusk et al., 1982; Smith, 2018).

Various media outlets call the era following COVID-19, The Great Resignation (Cook, 2021; Flowers & Rosenburg, 2021; Hemmer, 2021; Hsu, 2021; Lufkin, 2021). Many workers, mainly between the ages of 30 and 45, are quitting their jobs to pursue happiness, better pay, and more flexibility (Cook, 2021; Hsu, 2021). People are gravitating toward careers where they can work remotely, allowing them to spend more time at home with family, focus on their health and exercise routines, spend less time commuting, and reduce their risk of contracting COVID-19. These resignations are happening across most job sectors (i.e., healthcare, information technology, education, entertainment, retail, food industry). While the older millennials (age 30 to 45) are quitting their jobs, it appears that younger millennials (age 25 to 30) may not have the necessary capital to leave their current positions (Cook, 2021). To reap the benefits of remote work, younger millennials who have not acquired the credential to meet the qualifications listed in remote job descriptions may return to college, potentially the community college. With such a broad scope of employment openings, including many STEM positions, researchers should investigate CCB STEM degree production following COVID-19.

Qualitative Research Ideas

"Without an in-depth understanding of how students progress or fail to progress through the community college, and why students make the choices that they do, we will not be able to develop informed interventions or efficiently modify institutional policies and practices to improve student outcomes" (Bahr, 2013, p. 144). Bahr (2013) argues that without the rich descriptions of student behaviors that come from qualitative research, the development of interventions are "more a product of guesswork than of sound and empirically based reasoning" (p. 144). The extant literature already presents some insight into how students perceive community college baccalaureate programs. Glen & Glen (2003) deployed a survey at a

community college in Texas with a relatively high number of minority students. The group found that some Black (28.8%) and Hispanic (33.3%) male students, compared to White (12.7%) male students, felt that CCB programs were their only pathway to the four-year degree. For female students, the percentages were 21.1 percent for Black women and 18.2 percent for Hispanic women, compared to 13.6 percent for White women. Glen & Glen (2003) also asked the same students if they would pursue a four-year degree at the community college. One hundred percent of the Hispanic male students responded "yes" or "maybe." This number was nearly 83% for Black male students, 69% for Black females, and 54.5% for Hispanic females. Researchers should continue the qualitative work of Glen & Glen (2003) in specific states.

Case Study

I recommend conducting a collective case study that explores states with varying CCB STEM program success. For example, Florida has numerous CCB institutions and CCB STEM programs (refer to Appendix B), whereas West Virginia has lesser activity surrounding CCB STEM programs. Case study research is a qualitative approach that involves the investigation of a case (i.e., CCB state) over time by collecting multiple sources of information (e.g., interview and survey data, observations, and enrollment data; Creswell & Poth, 2018). This type of qualitative study will allow the researcher to achieve an in-depth understanding of why students are or are not choosing CCB STEM programs in particular states. Furthermore, investigating multiple cases will allow for the collection of different perspectives on CCB STEM programs.

Limitations

Previous publications studying the influence of CCB programs on state-level degree production have reported no discernible effects (Daun-Barnett, 2011; Daun-Barnett, 2014; Park et al., 2018; Porter et al., 2014). However, these studies only investigated the impact of CCB-

implementation on nursing and teacher education degrees and might have been sensitive to small sample sizes and a limited timeframe. Given the unprecedented nature of CCB programs, sufficient time is needed to produce graduates and realize the full potential of these programs. To address these challenges in my study, I used a larger sample size and a timeframe extending to 2019. I included all four-year STEM degree completions in addition to nursing and STEM education degrees and attempted to include more CCB states in the treatment group. Yet, the treatment group I used may not be that different from the ones used in previous national studies (Park et al., 2018). I treated states with more recently enacted CCB policies (e.g., California, Colorado, and Ohio) as control units because they lacked CCB STEM programs, CCB STEM graduates, or sufficient post-treatment data. Nevertheless, this study is distinguishable from previous work in that I examine the causal effects of CCB-implementation on all STEM bachelor's degree production. Not just nursing and STEM education degrees. While the scale of this work might have contributed to the lack of statistical significance in my results, a nationwide glimpse at the impact of these programs is necessary to help state policymakers and community college leaders make informed decisions on how to move forward.

In addition to the broad nature of my study, time is a limiting factor. Due to insufficient post-treatment data, I had to eliminate four states with active CCB policies and CCB STEM graduates from the treatment group. In order for a state to meet the qualifications of the treatment group, it needed to have at least six years of post-treatment data. For this reason, I treated California, Colorado, Delaware, and Michigan as control units. However, neither of the previously mentioned states had many CCB STEM graduates (refer to Appendix C).

A third limitation deals with the variation in how states classify institutions. Failure to adequately differentiate institutions by Carnegie Classification could be problematic.

Interestingly, several STEM baccalaureate degree completions are evident at institutions in Ohio with the Carnegie Classifications of interest. Ohio did not gain CCB approval until 2018. Therefore, the institutions identified in Ohio are either four-year institutions or under a local university partnership. I treated Ohio as a control unit. I recognize that university partnerships are possible in other states with CCB approval, and I am pointing out my potential inability to weed out all institutions as a limitation of this study. I confirmed CCB states with existing publications (refer to Appendix G). To further verify the two-year degree-granting status of each institution, I perused each of their websites and curriculum catalogs.

Lastly, the inability to disentangle the impact of additional policies implemented simultaneously is another obstacle for this study. Nevertheless, this study assumes that states differ only by a CCB policy, a CCB STEM program, and CCB STEM graduates. Covariates are included in the analysis to control for possible confounding.

Conclusion

A solid and resilient STEM workforce is vital to the economic strength of this country. Therefore, state policymakers must do their part to ensure the pathways to four-year STEM degree production are optimal for all students to stimulate and maintain STEM degree growth. This research shows that the STEM shortage prevails. Currently, CCB STEM programs appear to have minimal impact on the four-year STEM degree attainment pipeline. However, the lack of statistical significance might be due to the reputation of community colleges, the extent of CCB implementation, low program capacity limits, or students shuffling from one institution type to another. States who have enacted CCB policies and others considering authorization should reflect on the community college narrative, STEM labor market incentives, and the magnitude required to produce meaningful results with CCB authorization. On the other hand, the reality

may be that there are a fixed number of students interested in four-year degrees, and those students might gravitate toward non-STEM degrees. However, this study does not validate any of these implications. Nevertheless, I urge state legislators to do a better job at promoting, funding, and advocating for community colleges. State policymakers should encourage the deployment of CCB programs on a large scale as mass implementation of CCB programs might prove to be a prerequisite to reaching the full potential of CCB authorization. Lastly, there should be a focus on improving post-transfer outcomes at four-year institutions. Modifying institutional policies, practices, and structures at transfer-receiving institutions to accommodate community college transfer students during the first semester has potential benefits.

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APPENDICES

APPENDIX A

Public Institutions Offering a Mix of Two-Year and Four-Year Degrees.

Institution Name	State Abbreviation	Carnegie Classification
University of Arkansas-Fort Smith	AR	22
Antelope Valley College	CA	14
Bakersfield College	CA	14
Cypress College	CA	14
Feather River Community College District	CA	14
Foothill College	CA	14
MiraCosta College	CA	14
Modesto Junior College	CA	14
Rio Hondo College	CA	14
San Diego Mesa College	CA	14
Santa Ana College	CA	14
Santa Monica College	CA	14
Shasta College	CA	14
Skyline College	CA	14
Solano Community College	CA	14
West Los Angeles College	CA	14
Community College of Denver	CO	14
Pueblo Community College	CO	14
Red Rocks Community College	CO	14
Delaware Technical Community College-Terry	DE	14
Broward College	FL	14
Chipola College	FL	23
College of Central Florida	FL	23
Daytona State College	FL	23
Eastern Florida State College	FL	14
Florida Gateway College	FL	14
Florida SouthWestern State College	FL	23
Florida State College at Jacksonville	FL	23
Gulf Coast State College	FL	14
Indian River State College	FL	23
Lake-Sumter State College	FL	14
Miami Dade College	FL	23
North Florida College	FL	14
Northwest Florida State College	FL	23
Palm Beach State College	FL	14

Institution Name	State Abbreviation	Carnegie Classification
Pasco-Hernando State College	FL	14
Pensacola State College	FL	14
Polk State College	FL	23
Saint Johns River State College	FL	14
Santa Fe College	FL	14
Seminole State College of Florida	FL	14
South Florida State College	FL	14
St Petersburg College	FL	23
State College of Florida-Manatee-Sarasota	FL	23
Tallahassee Community College	FL	14
The College of the Florida Keys	FL	14
Valencia College	FL	14
Atlanta Metropolitan State College	GA	23
College of Coastal Georgia	GA	23
Dalton State College	GA	22
East Georgia State College	GA	14
Georgia Highlands College	GA	14
Gordon State College	GA	23
South Georgia State College	GA	23
University of Hawaii Maui College	HI	14
Vincennes University	IN	14
Louisiana State University-Alexandria	LA	21
Alpena Community College	MI	14
Henry Ford College	MI	14
Jackson College	MI	14
Northwestern Michigan College	MI	14
Schoolcraft College	MI	14
Bismarck State College	ND	14
Northern New Mexico College	NM	23
College of Southern Nevada	NV	14
Great Basin College	NV	23
Western Nevada College	NV	14
SUNY College of Technology at Canton	NY	22
SUNY College of Technology at Delhi	NY	23
SUNY Morrisville	NY	23
Oklahoma State University Institute of Technology	OK	23
Oklahoma State University-Oklahoma City	OK	14
Brazosport College	TX	23
Midland College	TX	14

Institution Name	State Abbreviation	Carnegie Classification
South Texas College	TX	14
Tyler Junior College	TX	14
Dixie State University	UT	23
Snow College	UT	14
Utah Valley University	UT	20
Vermont Technical College	VT	23
Bellevue College	WA	14
Bellingham Technical College	WA	14
Cascadia College	WA	14
Centralia College	WA	14
Clark College	WA	14
Clover Park Technical College	WA	14
Columbia Basin College	WA	23
Edmonds Community College	WA	14
Grays Harbor College	WA	14
Green River College	WA	14
Highline College	WA	14
Lake Washington Institute of Technology	WA	14
North Seattle College	WA	14
Olympic College	WA	14
Peninsula College	WA	14
Pierce College-Fort Steilacoom	WA	14
Renton Technical College	WA	14
Seattle Central College	WA	14
Skagit Valley College	WA	14
South Seattle College	WA	14
Spokane Community College	WA	14
Spokane Falls Community College	WA	14
Tacoma Community College	WA	14
Wenatchee Valley College	WA	14
Whatcom Community College	WA	14
Yakima Valley College	WA	14
Madison Area Technical College	WI	14
Potomac State College of West Virginia University	WV	14
West Virginia University at Parkersburg	WV	23

APPENDIX B

CCB Programs In Florida and Washington, By Institution.

State	Institution Name	Four-Year Degrees Offered
Florida	Broward College	BAS Supervision and Management BAS Information Technology BAS Technology Management BS Teacher Education in Exceptional Student Education BS Teacher Education in Secondary Biology BS Teacher Education in Middle Grades Mathematics BS in Teacher Education in Secondary Mathematics BS in Nursing RN to BSN
	Chipola College	BS Teacher Education in Elementary Education K-6 BS Teacher Education in English Educations BS in Teacher Education In Exceptional Student Education BS Teacher Education in Middle School Math Education (grades 5-9) and Mathematics Education (grades 6-12) BS Teacher Education in Middle School Science Education (grades 5-9) and Biology Education (grades 6-12) BS Teacher Education in English Education BS Business Administration – Accounting BS Business Administration – Engineering Management BS Business Administration – Engineering Management BS Business Administration – Information Systems BS Business Administration - Management BS Nursing RN to BSN
	College of Central Florida	Bachelor of Applied Science (BAS) Business and Organizational Management BAS Accounting Specialization BAS Equine Studies BAS Health Care Management Specialization BAS Logistics & Supply Chain Management Specialization BAS Management Information Systems Specialization BAS Public Safety Administration Specialization BS Early Childhood Education BS Nursing
	Daytona State College	BAS Supervision and Management BAS Supervision and Management Hospitality

State	Institution Name	Four-Year Degrees Offered
		BS Information Technology
		BS Elementary Education
		BS Exceptional Education
		BS Secondary Biology Education
		BS Secondary Chemistry Education
		BS Secondary Earth/Space Science Education
		BS Secondary Mathematics Education
		BS Secondary Physics Education
		BS Engineering Technology
		BS Engineering Technology – Electrical Engineering Concentration
	Eastern Florida State College	BS Nursing RN to BSN
		BAS Applied Health Sciences Advanced Allied Health
		BAS Applied Health Sciences Biotechnology
		BAS Applied Health Sciences Biomedical Sciences
		BAS Applied Health Sciences Medical Imaging CT, MRI, or Vascular Sonograph
		BAS Applied Health Sciences Medical Imaging Informatics/PACS
		BAS Applied Health Sciences Veterinary Nursing
		BAS Computer Information Systems Technology Computer Project Management
		BAS Computer Information Systems Technology Cybersecurity
		BAS Computer Information Systems Technology Data Science
		BAS Computer Information Systems Technology Networking Systems
		BAS Computer Information Systems Technology Data Science
		BAS Computer Information Systems Technology Program & Software Development
		BAS Organizational Management
	Florida Gateway College	BAS Water Resources Management
		BS Early Child Education
		BS Nursing
		BAS Supervision and Management
	Florida South Western State College	BAS Public Safety
		BAS Supervision and Management
		BS Elementary Education

State	Institution Name	Four-Year Degrees Offered
		BS Cardiopulmonary Sciences
		BS Nursing
	Florida State College at Jacksonville	BS Biomedical Sciences
		BS Business Administration
		BS Communication and Media
		BAS Computer Systems Networking and Telecommunications
		BAS Digital Media
		BS Early Childhood Education
		BS Financial Services
		BS Human Services
		BAS information Technology Management
		BAS Logistics
		BS Nursing
		BAS Public Safety Management
		BAS Supervision and Management
	Gulf Coast State College	BAS Digital Media Production Specialization
		BAS Digital Media Web Development Specialization
		BAS Organizational Management Entrepreneurship Option
		BAS Organizational Management Health Services Option
		BS Nursing RN to BSN
		BAS Technology Management
	The College of Florida Keys	BS Nursing
		BAS Supervision and Management
	Indian River State College	BS Accounting
		BS Biology
		BS Business Administration
		BS Criminal Justice
		BAS Digital Media Animation, Gamin & Modeling
		BAS Digital Media Graphic Design and Visual Communication
		BS Elementary Education
		BS Exceptional Student Education
		BS Middles Grades Mathematics
		BS Middle Grades Science
		BS Secondary Biology
		BS Secondary Mathematics
		BS Healthcare Management
		BS Human Services Addiction Studies

State	Institution Name	Four-Year Degrees Offered
		BS Human Services Generalist Concentration
		BS Human Services Youth and Families Studies
		BS Information Technology Management and Cybersecurity
		BS Nursing
		BAS Organization Management
		BS Public Administration Emergency Planning and Management
		BS Public Administration Public Policy and Leadership
	Lake Sumter State College	BAS Organizational Management
		BS Nursing
	Miami Dade State College	BS in Film, Television and Digital Production
		BAS supervision and Management
		BAS in Supply Chain Management
		BS Early Childhood Education
		BS Exceptional Student Education K-12
		BS Secondary Science Education
		BS Secondary Mathematics Education
		BS Nursing RN to BSN
		BS Physican Assistant Studies
		BS Public Safety Management Crime Scene Investigation
		BS Public Safety Management Criminal Justice
		BAS Public Safety Management (Emergency Management)
		BAS Public Safety Management Security/Loss Prevention
		BS Biological Sciences Biotechnology
		BS Biological Sciences Biopharmaceutical Services
		BS Biological Sciences Science Education
		BS Data Analytics
		BS Electrical and Computer Engineering Technology
		BS Information Systems Technology Application Development
		BS Information Systems Technology Cybersecurity
		BS Information Systems Networking
	North Florida Community College	BS Nursing
		BS Management & Supervision Health Care Management
		BS Management & Supervision Human Resources Management

State	Institution Name	Four-Year Degrees Offered
		BS Management & Supervision Military Leadership & Management
		BS Management & Supervision Supervision
		BS Project Management Acquisitions
		BS Project Management Logistics
		BS Project Management Management
		BS Project Management Quality Improvement
		BS Project Management Technology Management
		BS Early Childhood Birth Through Four
		BS Elementary Education
	Palm Beach State College	BS Nursing
		BAS Information Management Database Administration
		BAS Information Management Security & Network Assurance (IT Forensics)
		BAS Information Management Project Management
		BAS Supervision & Management General Management
		BAS Supervision & Management Health Management
		BAS Supervision & Management Entreprenuership
		BAS Supervision & Management Project Management
	Pasco Hernando State College	BAS Supervision & Management
		BS Nursing
	Pensacola State College	BAS Business & Management Organization Management
		BAS Business & Management Public Safety Management
		BAS Business & Management Health Care Management
		BAS Business & Management Project Management
		BAS Business & Management Human Resources Management
		BAS Business & Management Law Enforcement Administration Management
		BAS Business & Management Graphic Design Management
		BAS Cybersecurity Cyberforensics
		BAS Cybersecurity Information Security
		BS Nursing
	Polk State College	BAS Supervision & Management Business Administration
		BAS Supervision & Management Business Information Technology

State	Institution Name	Four-Year Degrees Offered
	St. Petersburg College	BAS Supervision & Management Healthcare Administration BAS Supervision & Management Public Administration BAS Supervision & Management Public Safety Measurement BS Criminal Justice BS Nursing BS Elementary Education BS Early Childhood Education BS Biology BS Dental Hygiene BS Educational Studies and Community Leadership Educational Interpreting BS Elementary Education BS Exceptional Student Education BAS Health Services Administration Respiratory Care BS Middle Grades General Science Education BS Nursing BS Public Policy & Administration BS Secondary Mathematics Education BAS Technology Development & Management BS Educational Studies and Community Leadership Early Childhood Education BS Business Administration BS Educational Studies and Community Leadership Interdisciplinary BS Elite Educator Program Elementary Education BAS Health Services Administration Management BAS Health Services Administration Public Relations & Marketing BAS Health Services Administration Compliance & Security BAS Health Services Administration Human Services BAS Health Services Administration Respiratory Care BS Management & Organizational Leadership General Management & Organizational Leadership BS Management & Organizational Leadership Entrepreneurship BS Management & Organizational Leadership Project Management BS Management & Organizational Leadership Sports Management

State	Institution Name	Four-Year Degrees Offered
		BS Management & Organizational Leadership Sustainability and Green Management
		BS Middle Grades Mathematics Education
		BAS Paralegal Studies
		BAS Public Safety Administration Criminal Justice
		BAS Public Safety Administration Emergency Management and Homeland Security
		BAS Public Safety Administration Fire Science
		BAS Public Safety Administration Cross Discipline
		BAS Sustainability Management
		BAS Veterinary Technology Advanced Clinical Applications
		BAS Veterinary Technology Veterinary Management
		BAS Veterinary Technology Combined Clinical and Hospital Management
	Santa Fe State College	BS Accounting
		BAS Clinical Laboratory Science
		BS Early Childhood Education
		BAS Information Systems Technology Networking
		BAS Information Systems Technology Programming
		BAS Information Systems Technology Security
		BAS Industrial Biotechnology
		BAS Multimedia and Video Production Technology
		BS Nursing
		BAS Organizational Management Management
		BAS Organizational Management Human Resource Management
		BAS Organizational Management Public Safety Management
		BAS Organizational Management Information Technology Management
	Seminole State College of Florida	BS Nursing RN to BSN
		BAS Business Technology Supply Chain Management
		BAS Business Technology Entrepreneurship
		BAS Business Technology Interdisciplinary
		BAS Business Technology European Business Experience
		BAS Business Technology Human Resources
		BAS Business Technology Social Media and E-Marketing
		BS Construction
		BS Engineering Technology
		BS Health Sciences Respiratory Therapy & Clinical Leadership

State	Institution Name	Four-Year Degrees Offered
		BS Health Sciences Health Coaching & Human Performances
		BS Health Sciences Healthcare Management & Professional Services
		BS Health Sciences Simulation in Healthcare Education
		BS Health Sciences Clinical Sciences & Community Paramedic
		BAS Interior Design
		BS Information Technology Cyber Security
		BS Information Technology Programming
	State College of Florida, Manatee-Sarasota	BS Early Childhood Education
		BAS Health Services Administration
		BS Nursing
		BAS Public Safety and Emergency Management Public Safety Administration
		BAS Public Safety and Emergency Management Homeland Security
		BAS Supervision & Management
	St. Johns River State College	BS Early Childhood Education
		BAS Organizational Management Computer Information Systems
		BAS Organizational Management Healthcare Administration
		BAS Organizational Management Supervision & Management
		BS Nursing
	South Florida State College	BS Elementary Education
		BAS Supervision & Management
		BS Nursing
	Valencia College	BS Electrical and Computer Engineering Technology Computer Systems
		BS Electrical and Computer Engineering Technology Electrical/Electronic Systems
		BS Electrical and Computer Engineering Technology Laser and Photonics
		BS Cardiopulmonary Sciences Community Health
		BS Cardiopulmonary Sciences Leadership
		BS Cardiopulmonary Sciences Non-Invasive Cardiology
		BAS Business & Organizational Leadership

State	Institution Name	Four-Year Degrees Offered
		BAS Computing Technology and Software Development
		BS Radiologic And Imaging Sciences Cardiac Ultrasound
		BS Radiologic And Imaging Sciences Computed Tomography (CT)
		BS Radiologic And Imaging Sciences Leadership
		BS Radiologic And Imaging Sciences Magnetic Resonance Imaging (MRI)
		BS Radiologic And Imaging Sciences Mammography
		BS Radiologic And Imaging Sciences Vascular Ultrasound
		BS Nursing
Washington	Bellevue College	BAS Applied Accounting
		BS Computer Sciences
		BAS Data Analytics
		BAS Digital Marketing
		BAS Healthcare Informatics
		BAS Health Promotion Management
		BAS Healthcare Management and Leadership
		BAS Information Systems and Technology
		Bachelor of Applied Arts (BAA) Interior Design
		BAS Molecular Biosciences
		BS Nursing RN to BSN
		BAS Radiation and Imaging Sciences
	Bellingham Technical College	BAS Operations Management
		BAS Engineering Technology
	Cascadia College	BAS Sustainable Practices
		BAS Information Technology: Application Development
	Centralia College	BAS Applied Management
		BAS Diesel Technology
		BAS Information Technology in Application Development
		BAS Teacher Education: Elementary Education and Special Education
	Clark College	BAS Dental Hygiene
		BAS Applied Management
		BAS Human Services
		BAS Cybersecurity
	Clover Park Technical College	BAS Cybersecurity
		BAS Interior Design

State	Institution Name	Four-Year Degrees Offered
		BAS Mechatronics Engineering Technology and Automation
		BAS Operations Management
	Columbia Basin College	BAS Applied Management
		BAS Cyber Security
		BAS Dental Hygiene
		BAS Health Physics
		BAS Information Technology
		BAS Project Management
		BAS Teaching
		BA Nursing RN to BSN
	Edmonds Community College	BAS Advanced Manufacturing and Materials Engineering Technology
		BAS Child, Youth, and Family Studies
		BAS Information Technology: Application Development
	Grays Harbor College	BAS Forest Resource Management
		BAS Organizational Management
		BAS Teacher Education: Elementary and Special Education
	Green River College	BAS Aeronautical Science
		BAS Early Childhood Education: Infant and Child Mental Health
		BAS Forest Resource Management
		BAS Information Technology: Network Administration and Security
		BAS Information Technology: Software Development
		BAS Marketing and Entrepreneurship
		BAS Applied Management
		BAS Realtime Court Reporting and Captioning
	Highline College	BAS Cyber Security and Forensics
		BAS Global Trade and Logisitcs
		BAS Respiratory Care
		Bachelor of Applied Behavioral Science (BABS) Youth Development
		BABS Teaching and Early Learning
		BAS Integrated Design
	Lake Washington Institute of Technology	BAS Applied Management-Entrepreneurship
		BAS Behavioral Healthcare
		BAS Computing and Software Development
		BAS Dental Hygiene
		BAS Design
		BAS Digital Gaming and Interactive Media

State	Institution Name	Four-Year Degrees Offered
		BAS Early Childhood Education
		BAS Funeral Service Education
		BAS Nursing
		BAS Public Health
		BAS Transportation, Logistics and Supply Management
	Lower Columbia College	BAS Teacher Education
	North Seattle College	BAS Application Development
		BAS Early Childhood Education
		BAS International Business
		BAS Residential and Commercial Property Management
	Olympic College	BAS Information Systems
		BAS Organizational Leadership and Technical Management
		BS Nursing RN to BSN
		BAS Digital Filmmaking
	Peninsula College	BAS Applied Management
		BAS Dental Hygiene
		BAS Teaching
		BAS Homeland Security Emergency Management
		BAS Business Management
		BAS Fire Science Leadership Management
	Renton Technical College	BAS Application Development
		BAS Information Technology Computer Network Architecture
	Seattle Central College	BAS Allied Health Science
		BAS Behavioral Sciences
		BS Nursing RN to BSN
		BAS Information Technology: Networking
		BAS Community Health and Education
		BAS Dental Hygiene
		BAS Healthcare Services Management
	Skagit Valley College	BAS Environmental Conservation
		BAS Applied Management
	South Seattle College	BAS Hospitality Management
		BAS Professional Technical Education and Instructional Design
		BAS Sustainable Building Science Technology
		BAS Workforce and Trades Leadership
	Spokane Community College	BAS Respiratory Care

State	Institution Name	Four-Year Degrees Offered
	Spokane Falls Community College	BAS Information Systems and Technology
		BAS in Applied Management
		BAS Cyber Security
	Tacoma Community College	BAS Community Health
		BAS Health Information Management
		BAS IT Networking Information Systems and Technology
		BAS Management
	Walla Walla Community College	BAS Agricultural Systems
		BAS Applied Management and Entrepreneurship
	Wenatchee Valley College	BS Nursing RN to BSN
		BAS Engineering Technology
		BAS Data Analytics
		BAS Teaching
	Whatcom Community College	BAS Information Technology Networking
	Yakima Valley College	BAS Applied Business Management
		BAS Information Technology Networking
		BAS Dental Hygiene
		BAS Teacher Education

Note. Adapted from https://www.accbd.org/programs-by-state/

APPENDIX C

Total Number of CCB Degrees By State, By CIP.

State Abbreviation	CIP Codes - Non-Teacher Education																
	01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
AR	0	0	0	41	519	0	15	438	51	0	125	0	566	10	0	897	2662
CA	19	0	0	0	0	0	31	0	0	0	0	21	0	0	19	224	314
CO	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	55	59
DE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43	43
FL	0	0	289	450	4285	0	691	910	0	0	0	0	0	0	0	15637	22262
GA	0	0	2	0	0	0	0	722	115	0	69	10	341	0	0	1608	2867
HI	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	25
IN	0	0	0	0	0	0	318	0	0	0	0	0	0	0	0	407	725
LA	0	0	0	0	0	0	0	117	48	0	8	0	327	0	0	222	722
MI	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	16
ND	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	0	0	45	0	15	12	59	54	10	0	0	0	0	0	0	43	238
NV	1	0	31	0	29	0	90	6	0	0	0	0	0	96	0	415	668
NY	687	42	177	0	645	0	282	0	0	0	0	0	153	1	282	2171	4440
OK	0	0	0	0	475	0	307	0	0	0	0	0	0	0	0	0	782
TX	0	0	0	0	336	0	0	0	0	0	0	0	0	0	0	488	824
UT	0	0	34	24	3196	186	219	1576	149	0	360	0	4848	504	3	2730	13829
VT	75	0	0	0	145	107	790	0	0	0	0	0	0	0	0	123	1240
WA	0	0	122	11	850	0	0	12	0	0	0	0	0	0	20	1389	2404
WI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	0	0	0	0	0	0	214	0	0	0	0	0	0	0	0	52	266

State Abbreviation	CIP Codes - Teacher Education																	
	13.1301	13.1307	13.1309	13.1311	13.1316	13.1317	13.1319	13.132	13.1321	13.1322	13.1323	13.1327	13.1329	12.1332	13.1335	13.1337	13.1338	Total
AR	0	0	0	41	0	0	0	0	0	30	2	0	0	0	0	0	0	73
CA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	0	0	19	601	145	0	0	0	0	167	9	0	0	0	0	0	0	941
GA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	0	0	0	26	14	0	0	0	0	0	0	0	0	0	0	0	0	40
LA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	2	0	0	8	0	13	0	0	0	5	0	0	0	0	0	0	0	28
NY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UT	0	175	0	155	64	18	0	0	0	132	10	0	5	0	0	0	0	559
VT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	0	0	0	0	0	0	47	0	0	0	0	0	0	0	0	0	0	47
WI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

APPENDIX D

Total Number of CCB Degrees By State, By Year, By CIP.

		CIP Codes - Non-Teacher Education																
State Abbreviation	Year	01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
AR	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	2003	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	6
AR	2004	0	0	0	0	19	0	0	0	0	0	0	0	0	0	0	0	19
AR	2005	0	0	0	0	21	0	1	1	0	0	0	0	11	0	0	3	37
AR	2006	0	0	0	0	20	0	0	8	3	0	0	0	24	0	0	5	60
AR	2007	0	0	0	0	39	0	0	14	4	0	3	0	35	0	0	15	110
AR	2008	0	0	0	0	20	0	0	16	2	0	2	0	41	0	0	14	95
AR	2009	0	0	0	0	14	0	0	24	2	0	2	0	39	0	0	16	97
AR	2010	0	0	0	0	24	0	0	23	1	0	6	0	38	0	0	42	134
AR	2011	0	0	0	0	28	0	0	22	0	0	3	0	34	0	0	57	144
AR	2012	0	0	0	7	33	0	0	28	1	0	2	0	45	0	0	78	194

State Abbreviation	Year	CIP Codes - Non-Teacher Education																
		01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
AR	2013	0	0	0	1	39	0	0	43	1	0	9	0	47	0	0	83	223
AR	2014	0	0	0	3	44	0	0	32	1	0	5	0	41	0	0	86	212
AR	2015	0	0	0	7	45	0	0	45	6	0	13	0	46	0	0	81	243
AR	2016	0	0	0	14	39	0	0	42	4	0	18	0	50	2	0	99	268
AR	2017	0	0	0	9	43	0	0	43	5	0	15	0	45	1	0	89	250
AR	2018	0	0	0	0	51	0	4	53	9	0	20	0	36	2	0	110	285
AR	2019	0	0	0	0	40	0	4	44	12	0	27	0	34	5	0	119	285
CA	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

State Abbreviation	Year	CIP Codes - Non-Teacher Education																
		01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
CA	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2018	8	0	0	0	0	0	7	0	0	0	0	0	0	0	0	67	82
CA	2019	11	0	0	0	0	0	24	0	0	0	0	21	0	0	19	157	232
CO	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

State Abbreviation	Year	CIP Codes - Non-Teacher Education																
		01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
CO	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4
CO	2018	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	31	32
CO	2019	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	20	23
DE	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

State Abbreviation	Year	CIP Codes - Non-Teacher Education																
		01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
DE	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43	43
FL	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

State Abbreviation	Year	CIP Codes - Non-Teacher Education																
		01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
FL	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28	28
FL	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52	52
FL	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	151	151
FL	2007	0	0	0	0	87	0	0	0	0	0	0	0	0	0	0	183	270
FL	2008	0	0	0	0	67	0	0	0	0	0	0	0	0	0	0	199	266
FL	2009	0	0	0	0	101	0	0	0	0	0	0	0	0	0	0	253	354
FL	2010	0	0	0	0	71	0	0	0	0	0	0	0	0	0	0	377	448
FL	2011	0	0	9	0	83	0	2	0	0	0	0	0	0	0	0	695	789
FL	2012	0	0	23	2	169	0	17	7	0	0	0	0	0	0	0	921	1139
FL	2013	0	0	33	38	242	0	70	44	0	0	0	0	0	0	0	1091	1518
FL	2014	0	0	23	51	360	0	95	99	0	0	0	0	0	0	0	1316	1944
FL	2015	0	0	19	51	410	0	89	114	0	0	0	0	0	0	0	1702	2385
FL	2016	0	0	32	73	559	0	99	166	0	0	0	0	0	0	0	1949	2878
FL	2017	0	0	29	87	634	0	105	160	0	0	0	0	0	0	0	2021	3036
FL	2018	0	0	65	78	679	0	99	162	0	0	0	0	0	0	0	2274	3357
FL	2019	0	0	56	70	823	0	115	158	0	0	0	0	0	0	0	2425	3647
GA	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

State Abbreviation	Year	CIP Codes - Non-Teacher Education																
		01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
GA	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2010	0	0	0	0	0	0	0	5	2	0	0	0	0	0	0	0	7
GA	2011	0	0	0	0	0	0	0	15	6	0	1	0	0	0	0	38	60
GA	2012	0	0	0	0	0	0	0	36	6	0	3	0	2	0	0	87	134
GA	2013	0	0	0	0	0	0	0	48	5	0	5	0	10	0	0	124	192
GA	2014	0	0	0	0	0	0	0	73	11	0	3	0	38	0	0	158	283
GA	2015	0	0	0	0	0	0	0	77	22	0	4	0	32	0	0	202	337
GA	2016	0	0	0	0	0	0	0	97	17	0	11	0	57	0	0	233	415
GA	2017	0	0	0	0	0	0	0	115	18	0	10	0	61	0	0	252	456
GA	2018	0	0	0	0	0	0	0	114	10	0	15	1	72	0	0	237	449

State Abbreviation	Year	CIP Codes - Non-Teacher Education																
		01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
GA	2019	0	0	2	0	0	0	0	142	18	0	17	9	69	0	0	277	534
HI	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2012	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3
HI	2013	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4
HI	2014	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4

State Abbreviation	Year	CIP Codes - Non-Teacher Education																
		01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
HI	2015	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
HI	2016	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4
HI	2017	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
HI	2018	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3
HI	2019	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4
IN	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	2007	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	13
IN	2008	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	5	12
IN	2009	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0	4	17
IN	2010	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	28	34

State Abbreviation	Year	CIP Codes - Non-Teacher Education																
		01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
IN	2011	0	0	0	0	0	0	26	0	0	0	0	0	0	0	0	16	42
IN	2012	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	26	46
IN	2013	0	0	0	0	0	0	31	0	0	0	0	0	0	0	0	30	61
IN	2014	0	0	0	0	0	0	22	0	0	0	0	0	0	0	0	22	44
IN	2015	0	0	0	0	0	0	36	0	0	0	0	0	0	0	0	45	81
IN	2016	0	0	0	0	0	0	35	0	0	0	0	0	0	0	0	56	91
IN	2017	0	0	0	0	0	0	32	0	0	0	0	0	0	0	0	68	100
IN	2018	0	0	0	0	0	0	39	0	0	0	0	0	0	0	0	57	96
IN	2019	0	0	0	0	0	0	38	0	0	0	0	0	0	0	0	50	88
LA	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	2005	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
LA	2006	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3

State Abbreviation	Year	CIP Codes - Non-Teacher Education																
		01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
LA	2007	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	15
LA	2008	0	0	0	0	0	0	0	7	0	0	0	0	20	0	0	0	27
LA	2009	0	0	0	0	0	0	0	3	2	0	0	0	27	0	0	0	32
LA	2010	0	0	0	0	0	0	0	2	3	0	0	0	23	0	0	0	28
LA	2011	0	0	0	0	0	0	0	6	5	0	0	0	25	0	0	1	37
LA	2012	0	0	0	0	0	0	0	11	1	0	0	0	19	0	0	8	39
LA	2013	0	0	0	0	0	0	0	8	3	0	0	0	26	0	0	8	45
LA	2014	0	0	0	0	0	0	0	7	7	0	0	0	24	0	0	15	53
LA	2015	0	0	0	0	0	0	0	14	3	0	0	0	31	0	0	15	63
LA	2016	0	0	0	0	0	0	0	8	9	0	0	0	17	0	0	17	51
LA	2017	0	0	0	0	0	0	0	17	5	0	0	0	22	0	0	29	73
LA	2018	0	0	0	0	0	0	0	12	2	0	4	0	34	0	0	46	98
LA	2019	0	0	0	0	0	0	0	15	8	0	4	0	44	0	0	83	154
MI	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

State Abbreviation	Year	CIP Codes - Non-Teacher Education																
		01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
MI	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2017	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
MI	2018	0	0	0	0	0	4	2	0	0	0	0	0	0	0	0	0	6
MI	2019	0	0	0	0	0	4	5	0	0	0	0	0	0	0	0	0	9
ND	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

State Abbreviation	Year	CIP Codes - Non-Teacher Education																
		01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
ND	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

State Abbreviation	Year	CIP Codes - Non-Teacher Education																
		01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
NM	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2009	0	0	0	0	7	0	1	2	0	0	0	0	0	0	0	0	10
NM	2010	0	0	3	0	2	0	0	9	0	0	0	0	0	0	0	2	16
NM	2011	0	0	2	0	6	0	8	2	0	0	0	0	0	0	0	7	25
NM	2012	0	0	1	0	0	3	0	5	0	0	0	0	0	0	0	5	14
NM	2013	0	0	5	0	0	3	8	2	1	0	0	0	0	0	0	4	23
NM	2014	0	0	6	0	0	1	3	8	1	0	0	0	0	0	0	8	27
NM	2015	0	0	4	0	0	3	6	3	0	0	0	0	0	0	0	4	20
NM	2016	0	0	7	0	0	2	5	7	3	0	0	0	0	0	0	3	27
NM	2017	0	0	8	0	0	0	9	3	2	0	0	0	0	0	0	4	26
NM	2018	0	0	7	0	0	0	10	6	2	0	0	0	0	0	0	2	27
NM	2019	0	0	2	0	0	0	9	7	1	0	0	0	0	0	0	4	23
NV	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

State Abbreviation	Year	CIP Codes - Non-Teacher Education																
		01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
NV	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	2002	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
NV	2003	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
NV	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3
NV	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4
NV	2006	0	0	3	0	0	0	1	0	0	0	0	0	0	13	0	9	26
NV	2007	0	0	0	0	0	0	2	0	0	0	0	0	0	10	0	21	33
NV	2008	1	0	0	0	3	0	0	0	0	0	0	0	0	9	0	12	25
NV	2009	0	0	3	0	3	0	4	0	0	0	0	0	0	4	0	13	27
NV	2010	0	0	0	0	2	0	3	0	0	0	0	0	0	6	0	13	24
NV	2011	0	0	2	0	2	0	2	0	0	0	0	0	0	9	0	23	38
NV	2012	0	0	7	0	3	0	5	0	0	0	0	0	0	8	0	29	52
NV	2013	0	0	3	0	1	0	6	0	0	0	0	0	0	1	0	17	28
NV	2014	0	0	2	0	1	0	11	0	0	0	0	0	0	6	0	37	57
NV	2015	0	0	4	0	2	0	15	0	0	0	0	0	0	3	0	48	72
NV	2016	0	0	0	0	6	0	11	0	0	0	0	0	0	0	0	56	73

State Abbreviation	Year	CIP Codes - Non-Teacher Education																
		01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
NV	2017	0	0	2	0	1	0	9	0	0	0	0	0	0	4	0	48	64
NV	2018	0	0	4	0	3	0	11	0	0	0	0	0	0	5	0	36	59
NV	2019	0	0	1	0	2	0	8	6	0	0	0	0	0	11	0	53	81
NY	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	1999	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
NY	2000	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
NY	2001	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
NY	2002	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	1	16
NY	2003	17	0	0	0	7	0	0	0	0	0	0	0	0	0	0	4	28
NY	2004	26	0	2	0	23	0	0	0	0	0	0	0	0	0	4	0	55
NY	2005	17	0	6	0	37	0	0	0	0	0	0	0	0	0	10	5	75
NY	2006	23	0	5	0	44	0	0	0	0	0	0	0	0	0	15	14	101
NY	2007	28	0	5	0	49	0	0	0	0	0	0	0	0	0	17	17	116
NY	2008	37	0	15	0	44	0	0	0	0	0	0	0	0	0	18	17	131
NY	2009	38	0	9	0	38	0	6	0	0	0	0	0	0	0	20	17	128
NY	2010	33	0	7	0	46	0	8	0	0	0	0	0	0	0	25	44	163
NY	2011	37	0	20	0	68	0	0	0	0	0	0	0	0	0	23	74	222
NY	2012	55	0	15	0	56	0	3	0	0	0	0	0	0	1	8	103	241

State Abbreviation	Year	CIP Codes - Non-Teacher Education																
		01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
NY	2013	46	0	12	0	31	0	26	0	0	0	0	0	0	0	12	126	253
NY	2014	50	0	22	0	48	0	27	0	0	0	0	0	4	0	18	188	357
NY	2015	52	0	12	0	37	0	29	0	0	0	0	0	21	0	19	244	414
NY	2016	48	0	8	0	34	0	40	0	0	0	0	0	24	0	28	326	508
NY	2017	53	0	17	0	33	0	42	0	0	0	0	0	32	0	17	318	512
NY	2018	54	0	9	0	31	0	53	0	0	0	0	0	41	0	25	339	552
NY	2019	73	0	13	0	19	0	48	0	0	0	0	0	31	0	23	334	541
OK	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2006	0	0	0	0	9	0	6	0	0	0	0	0	0	0	0	0	15
OK	2007	0	0	0	0	25	0	17	0	0	0	0	0	0	0	0	0	42
OK	2008	0	0	0	0	36	0	21	0	0	0	0	0	0	0	0	0	57

State Abbreviation	Year	CIP Codes - Non-Teacher Education																
		01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
OK	2009	0	0	0	0	29	0	14	0	0	0	0	0	0	0	0	0	43
OK	2010	0	0	0	0	27	0	18	0	0	0	0	0	0	0	0	0	45
OK	2011	0	0	0	0	40	0	9	0	0	0	0	0	0	0	0	0	49
OK	2012	0	0	0	0	36	0	18	0	0	0	0	0	0	0	0	0	54
OK	2013	0	0	0	0	36	0	25	0	0	0	0	0	0	0	0	0	61
OK	2014	0	0	0	0	42	0	36	0	0	0	0	0	0	0	0	0	78
OK	2015	0	0	0	0	48	0	17	0	0	0	0	0	0	0	0	0	65
OK	2016	0	0	0	0	41	0	27	0	0	0	0	0	0	0	0	0	68
OK	2017	0	0	0	0	41	0	32	0	0	0	0	0	0	0	0	0	73
OK	2018	0	0	0	0	37	0	36	0	0	0	0	0	0	0	0	0	73
OK	2019	0	0	0	0	28	0	31	0	0	0	0	0	0	0	0	0	59
TX	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

State Abbreviation	Year	CIP Codes - Non-Teacher Education																
		01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
TX	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2009	0	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	16
TX	2010	0	0	0	0	31	0	0	0	0	0	0	0	0	0	0	0	31
TX	2011	0	0	0	0	47	0	0	0	0	0	0	0	0	0	0	0	47
TX	2012	0	0	0	0	35	0	0	0	0	0	0	0	0	0	0	0	35
TX	2013	0	0	0	0	34	0	0	0	0	0	0	0	0	0	0	22	56
TX	2014	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0	58	73
TX	2015	0	0	0	0	23	0	0	0	0	0	0	0	0	0	0	94	117
TX	2016	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	84	110
TX	2017	0	0	0	0	27	0	0	0	0	0	0	0	0	0	0	71	98
TX	2018	0	0	0	0	36	0	0	0	0	0	0	0	0	0	0	79	115
TX	2019	0	0	0	0	46	0	0	0	0	0	0	0	0	0	0	80	126
UT	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UT	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UT	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UT	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UT	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UT	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UT	1996	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	6
UT	1997	0	0	0	0	10	0	7	0	0	0	0	0	0	0	3	0	20
UT	1998	0	0	0	0	13	0	12	0	0	0	0	0	0	0	0	0	25
UT	1999	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	11
UT	2000	0	0	0	0	35	0	0	0	0	0	0	0	14	0	0	0	49

State Abbreviation	Year	CIP Codes - Non-Teacher Education																
		01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
UT	2001	0	0	0	0	29	0	0	1	0	0	0	0	64	0	0	0	94
UT	2002	0	0	0	0	80	0	0	7	0	0	0	0	111	0	0	0	198
UT	2003	0	0	0	11	104	0	0	12	4	0	0	0	168	0	0	0	299
UT	2004	0	0	0	0	148	0	0	23	3	0	4	0	218	0	0	11	407
UT	2005	0	0	0	0	115	0	0	37	1	0	6	0	170	0	0	9	338
UT	2006	0	0	0	0	97	0	0	45	1	0	17	0	148	0	0	25	333
UT	2007	0	0	0	0	145	0	0	45	3	0	13	0	202	1	0	64	473
UT	2008	0	0	0	0	118	0	0	50	0	0	12	0	186	17	0	89	472
UT	2009	0	0	0	0	146	7	0	67	4	0	17	0	213	24	0	102	580
UT	2010	0	0	0	0	131	2	0	75	6	0	18	0	215	34	0	96	577
UT	2011	0	0	0	0	172	7	0	90	7	0	20	0	262	44	0	156	758
UT	2012	0	0	0	0	170	8	0	96	15	0	26	0	362	56	0	228	961
UT	2013	0	0	5	0	198	13	2	119	9	0	26	0	330	54	0	240	996
UT	2014	0	0	1	0	201	11	3	122	7	0	30	0	321	58	0	198	952
UT	2015	0	0	0	0	241	13	3	152	17	0	25	0	345	40	0	254	1090
UT	2016	0	0	7	0	233	17	10	145	14	0	33	0	334	32	0	247	1072
UT	2017	0	0	6	0	256	32	51	155	16	0	31	0	326	48	0	325	1246
UT	2018	0	0	8	0	261	33	69	164	21	0	33	0	407	44	0	323	1363
UT	2019	0	0	7	13	276	43	62	171	21	0	49	0	452	52	0	363	1509
VT	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	1995	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	7
VT	1996	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	12

State Abbreviation	Year	CIP Codes - Non-Teacher Education																
		01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
VT	1997	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	20
VT	1998	0	0	0	0	0	0	16	0	0	0	0	0	0	0	0	0	16
VT	1999	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	15
VT	2000	0	0	0	0	0	0	19	0	0	0	0	0	0	0	0	0	19
VT	2001	0	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	17
VT	2002	0	0	0	0	0	0	19	0	0	0	0	0	0	0	0	0	19
VT	2003	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	29
VT	2004	0	0	0	0	0	0	34	0	0	0	0	0	0	0	0	0	34
VT	2005	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	40
VT	2006	0	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	36
VT	2007	0	0	0	0	3	0	40	0	0	0	0	0	0	0	0	0	43
VT	2008	0	0	0	0	0	0	30	0	0	0	0	0	0	0	0	0	30
VT	2009	0	0	0	0	1	0	51	0	0	0	0	0	0	0	0	3	55
VT	2010	0	0	0	0	12	8	30	0	0	0	0	0	0	0	0	1	51
VT	2011	7	0	0	0	15	14	37	0	0	0	0	0	0	0	0	6	79
VT	2012	7	0	0	0	20	16	31	0	0	0	0	0	0	0	0	3	77
VT	2013	7	0	0	0	21	15	40	0	0	0	0	0	0	0	0	5	88
VT	2014	8	0	0	0	30	0	57	0	0	0	0	0	0	0	0	6	101
VT	2015	11	0	0	0	13	17	36	0	0	0	0	0	0	0	0	8	85
VT	2016	9	0	0	0	7	14	40	0	0	0	0	0	0	0	0	18	88
VT	2017	10	0	0	0	11	8	37	0	0	0	0	0	0	0	0	25	91
VT	2018	10	0	0	0	5	6	46	0	0	0	0	0	0	0	0	15	82
VT	2019	6	0	0	0	7	9	51	0	0	0	0	0	0	0	0	33	106
WA	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

State Abbreviation	Year	CIP Codes - Non-Teacher Education																
		01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
WA	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	22
WA	2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	18
WA	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	33
WA	2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55	55
WA	2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67	67
WA	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	60
WA	2015	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	87	95
WA	2016	0	0	10	0	83	0	0	0	0	0	0	0	0	0	5	169	267
WA	2017	0	0	26	0	159	0	0	0	0	0	0	0	0	0	0	238	423
WA	2018	0	0	40	0	272	0	0	3	0	0	0	0	0	0	6	274	595

State Abbreviation	Year	CIP Codes - Non-Teacher Education																
		01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
WA	2019	0	0	46	11	328	0	0	9	0	0	0	0	0	0	9	366	769
WI	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

State Abbreviation	Year	CIP Codes - Non-Teacher Education																
		01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
WI	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	2003	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
WV	2004	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	12
WV	2005	0	0	0	0	0	0	16	0	0	0	0	0	0	0	0	0	16
WV	2006	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	10
WV	2007	0	0	0	0	0	0	16	0	0	0	0	0	0	0	0	0	16
WV	2008	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	10
WV	2009	0	0	0	0	0	0	18	0	0	0	0	0	0	0	0	0	18
WV	2010	0	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0	17

State Abbreviation	Year	CIP Codes - Non-Teacher Education																
		01	02	03	10	11	14	15	26	27	29	40	41	42	45	47	51	Total
WV	2011	0	0	0	0	0	0	19	0	0	0	0	0	0	0	0	0	19
WV	2012	0	0	0	0	0	0	19	0	0	0	0	0	0	0	0	0	19
WV	2013	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	8
WV	2014	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	9
WV	2015	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	15
WV	2016	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0	5	18
WV	2017	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	14	26
WV	2018	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	8	20
WV	2019	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	25	32

		CIP Codes - Teacher Education																	
State Abbreviation	Year	1301	1307	1309	1311	1316	1317	1319	1332	1321	1322	1323	1327	1329	1332	1335	1337	1338	Total
AR	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AR	2005	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	2
AR	2006	0	0	0	5	0	0	0	0	0	1	0	0	0	0	0	0	0	6
AR	2007	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
AR	2008	0	0	0	2	0	0	0	0	0	4	1	0	0	0	0	0	0	7
AR	2009	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	2
AR	2010	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	3
AR	2011	0	0	0	1	0	0	0	0	0	3	0	0	0	0	0	0	0	4
AR	2012	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
AR	2013	0	0	0	3	0	0	0	0	0	3	0	0	0	0	0	0	0	6
AR	2014	0	0	0	3	0	0	0	0	0	3	0	0	0	0	0	0	0	6
AR	2015	0	0	0	8	0	0	0	0	0	2	0	0	0	0	0	0	0	10

		CIP Codes - Teacher Education																	
State Abbreviation	Year	1301	1307	1309	1311	1316	1317	1319	1332	1321	1322	1323	1327	1329	1332	1335	1337	1338	Total
AR	2016	0	0	0	3	0	0	0	0	0	2	0	0	0	0	0	0	0	5
AR	2017	0	0	0	2	0	0	0	0	0	3	0	0	0	0	0	0	0	5
AR	2018	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
AR	2019	0	0	0	5	0	0	0	0	0	5	0	0	0	0	0	0	0	10
CA	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		CIP Codes - Teacher Education																	
State Abbreviation	Year	1301	1307	1309	1311	1316	1317	1319	1332	1321	1322	1323	1327	1329	1332	1335	1337	1338	Total
CA	2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CA	2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		CIP Codes - Teacher Education																	
State Abbreviation	Year	1301	1307	1309	1311	1316	1317	1319	1332	1321	1322	1323	1327	1329	1332	1335	1337	1338	Total
CO	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		CIP Codes - Teacher Education																	
State Abbreviation	Year	1301	1307	1309	1311	1316	1317	1319	1332	1321	1322	1323	1327	1329	1332	1335	1337	1338	Total
DE	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DE	2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		CIP Codes - Teacher Education																	
State Abbreviation	Year	1301	1307	1309	1311	1316	1317	1319	1332	1321	1322	1323	1327	1329	1332	1335	1337	1338	Total
FL	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FL	2004	0	0	0	6	0	0	0	0	0	2	0	0	0	0	0	0	0	8
FL	2005	0	0	0	6	0	0	0	0	0	4	0	0	0	0	0	0	0	10
FL	2006	0	0	0	17	0	0	0	0	0	6	0	0	0	0	0	0	0	23
FL	2007	0	0	1	20	2	0	0	0	0	8	0	0	0	0	0	0	0	31
FL	2008	0	0	1	32	5	0	0	0	0	15	1	0	0	0	0	0	0	54
FL	2009	0	0	6	25	2	0	0	0	0	12	1	0	0	0	0	0	0	46
FL	2010	0	0	2	36	16	0	0	0	0	10	1	0	0	0	0	0	0	65
FL	2011	0	0	7	71	15	0	0	0	0	7	1	0	0	0	0	0	0	101
FL	2012	0	0	0	55	18	0	0	0	0	20	0	0	0	0	0	0	0	93
FL	2013	0	0	2	53	8	0	0	0	0	13	0	0	0	0	0	0	0	76
FL	2014	0	0	0	52	14	0	0	0	0	15	1	0	0	0	0	0	0	82
FL	2015	0	0	0	56	12	0	0	0	0	18	1	0	0	0	0	0	0	87
FL	2016	0	0	0	59	16	0	0	0	0	11	0	0	0	0	0	0	0	86
FL	2017	0	0	0	38	16	0	0	0	0	16	1	0	0	0	0	0	0	71
FL	2018	0	0	0	37	15	0	0	0	0	6	2	0	0	0	0	0	0	60
FL	2019	0	0	0	38	6	0	0	0	0	4	0	0	0	0	0	0	0	48
GA	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		CIP Codes - Teacher Education																	
State Abbreviation	Year	1301	1307	1309	1311	1316	1317	1319	1332	1321	1322	1323	1327	1329	1332	1335	1337	1338	Total
GA	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GA	2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		CIP Codes - Teacher Education																	
State Abbreviation	Year	1301	1307	1309	1311	1316	1317	1319	1332	1321	1322	1323	1327	1329	1332	1335	1337	1338	Total
HI	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

State Abbreviation	Year	CIP Codes - Teacher Education																	
		1301	1307	1309	1311	1316	1317	1319	1332	1321	1322	1323	1327	1329	1332	1335	1337	1338	Total
HI	2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HI	2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN	2009	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
IN	2010	0	0	0	6	3	0	0	0	0	0	0	0	0	0	0	0	0	9
IN	2011	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	3
IN	2012	0	0	0	5	3	0	0	0	0	0	0	0	0	0	0	0	0	8
IN	2013	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2

		CIP Codes - Teacher Education																	
State Abbreviation	Year	1301	1307	1309	1311	1316	1317	1319	1332	1321	1322	1323	1327	1329	1332	1335	1337	1338	Total
IN	2014	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	3
IN	2015	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
IN	2016	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
IN	2017	0	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	5
IN	2018	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
IN	2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		CIP Codes - Teacher Education																	
State Abbreviation	Year	1301	1307	1309	1311	1316	1317	1319	1332	1321	1322	1323	1327	1329	1332	1335	1337	1338	Total
LA	2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA	2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

State Abbreviation	Year	CIP Codes - Teacher Education																	
		1301	1307	1309	1311	1316	1317	1319	1332	1321	1322	1323	1327	1329	1332	1335	1337	1338	Total
MI	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MI	2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		CIP Codes - Teacher Education																	
State Abbreviation	Year	1301	1307	1309	1311	1316	1317	1319	1332	1321	1322	1323	1327	1329	1332	1335	1337	1338	Total
ND	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND	2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		CIP Codes - Teacher Education																	
State Abbreviation	Year	1301	1307	1309	1311	1316	1317	1319	1332	1321	1322	1323	1327	1329	1332	1335	1337	1338	Total
NM	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NM	2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		CIP Codes - Teacher Education																	
State Abbreviation	Year	1301	1307	1309	1311	1316	1317	1319	1332	1321	1322	1323	1327	1329	1332	1335	1337	1338	Total
NV	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	2007	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	3
NV	2008	2	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	5
NV	2009	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	3
NV	2010	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	3
NV	2011	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	3
NV	2012	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2
NV	2013	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2
NV	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NV	2016	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
NV	2017	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	2
NV	2018	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	2
NV	2019	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2

		CIP Codes - Teacher Education																	
State Abbreviation	Year	1301	1307	1309	1311	1316	1317	1319	1332	1321	1322	1323	1327	1329	1332	1335	1337	1338	Total
NY	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		CIP Codes - Teacher Education																	
State Abbreviation	Year	1301	1307	1309	1311	1316	1317	1319	1332	1321	1322	1323	1327	1329	1332	1335	1337	1338	Total
NY	2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		CIP Codes - Teacher Education																	
State Abbreviation	Year	1301	1307	1309	1311	1316	1317	1319	1332	1321	1322	1323	1327	1329	1332	1335	1337	1338	Total
OK	2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK	2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		CIP Codes - Teacher Education																	
State Abbreviation	Year	1301	1307	1309	1311	1316	1317	1319	1332	1321	1322	1323	1327	1329	1332	1335	1337	1338	Total
TX	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX	2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UT	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UT	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UT	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UT	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UT	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UT	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UT	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UT	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UT	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UT	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UT	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UT	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UT	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UT	2003	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1

		CIP Codes - Teacher Education																	
State Abbreviation	Year	1301	1307	1309	1311	1316	1317	1319	1332	1321	1322	1323	1327	1329	1332	1335	1337	1338	Total
UT	2004	0	0	0	4	3	0	0	0	0	3	0	0	0	0	0	0	0	10
UT	2005	0	0	0	4	2	0	0	0	0	8	0	0	0	0	0	0	0	14
UT	2006	0	0	0	3	5	0	0	0	0	7	0	0	0	0	0	0	0	15
UT	2007	0	1	0	11	9	0	0	0	0	7	2	0	0	0	0	0	0	30
UT	2008	0	4	0	5	4	0	0	0	0	11	1	0	0	0	0	0	0	25
UT	2009	0	13	0	8	6	0	0	0	0	6	0	0	0	0	0	0	0	33
UT	2010	0	15	0	6	2	0	0	0	0	5	0	0	0	0	0	0	0	28
UT	2011	0	19	0	4	5	0	0	0	0	11	1	0	0	0	0	0	0	40
UT	2012	0	12	0	9	5	0	0	0	0	9	3	0	0	0	0	0	0	38
UT	2013	0	16	0	10	1	0	0	0	0	12	0	0	0	0	0	0	0	39
UT	2014	0	16	0	25	2	0	0	0	0	1	2	0	0	0	0	0	0	46
UT	2015	0	23	0	18	6	0	0	0	0	15	1	0	1	0	0	0	0	64
UT	2016	0	11	0	12	5	2	0	0	0	13	0	0	0	0	0	0	0	43
UT	2017	0	17	0	14	4	7	0	0	0	7	0	0	3	0	0	0	0	52
UT	2018	0	17	0	5	3	3	0	0	0	8	0	0	1	0	0	0	0	37
UT	2019	0	11	0	17	2	6	0	0	0	8	0	0	0	0	0	0	0	44
VT	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		CIP Codes - Teacher Education																	
State Abbreviation	Year	1301	1307	1309	1311	1316	1317	1319	1332	1321	1322	1323	1327	1329	1332	1335	1337	1338	Total
VT	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VT	2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		CIP Codes - Teacher Education																	
State Abbreviation	Year	1301	1307	1309	1311	1316	1317	1319	1332	1321	1322	1323	1327	1329	1332	1335	1337	1338	Total
WA	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	2013	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
WA	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WA	2015	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	6
WA	2016	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	5
WA	2017	0	0	0	0	0	0	16	0	0	0	0	0	0	0	0	0	0	16
WA	2018	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	9
WA	2019	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	10
WI	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		CIP Codes - Teacher Education																	
State Abbreviation	Year	1301	1307	1309	1311	1316	1317	1319	1332	1321	1322	1323	1327	1329	1332	1335	1337	1338	Total
WI	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		CIP Codes - Teacher Education																	
State Abbreviation	Year	1301	1307	1309	1311	1316	1317	1319	1332	1321	1322	1323	1327	1329	1332	1335	1337	1338	Total
WI	2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WI	2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	2011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		CIP Codes - Teacher Education																	
State Abbreviation	Year	1301	1307	1309	1311	1316	1317	1319	1332	1321	1322	1323	1327	1329	1332	1335	1337	1338	Total
WV	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WV	2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note. California, Colorado, Delaware,North Dakota, and Wisconsin are included in this table but are considered control unit because there are no CCB STEM degrees produced in these states during the timeframe of interest or insufficient post-treatment data. I used the six digit CIP code to isolate the STEM education degrees. The table include the four numbers that make each CIP code unique. Add 13.xxxx to each CIP code in the table for the full six digit CIP code.

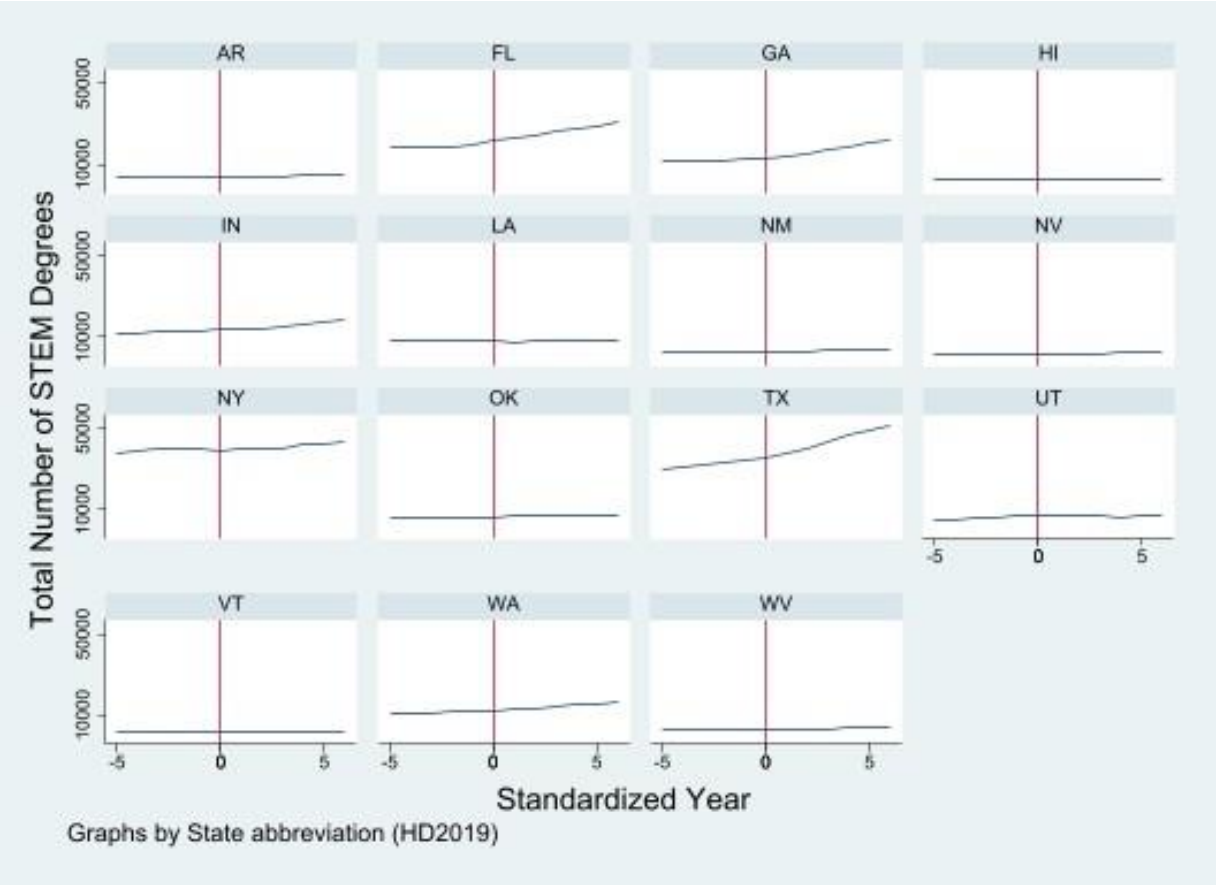
APPENDIX E

Race/Ethnicity Categories in IPEDS.

Race/Ethnicity
American Indian or Alaska Native
Asian
Black or African American
Hispanic or Latino
Native Hawaiian or Other Pacific Islander
White
Two or more races
Race/Ethnicity unknown
Nonresident alien

APPENDIX F

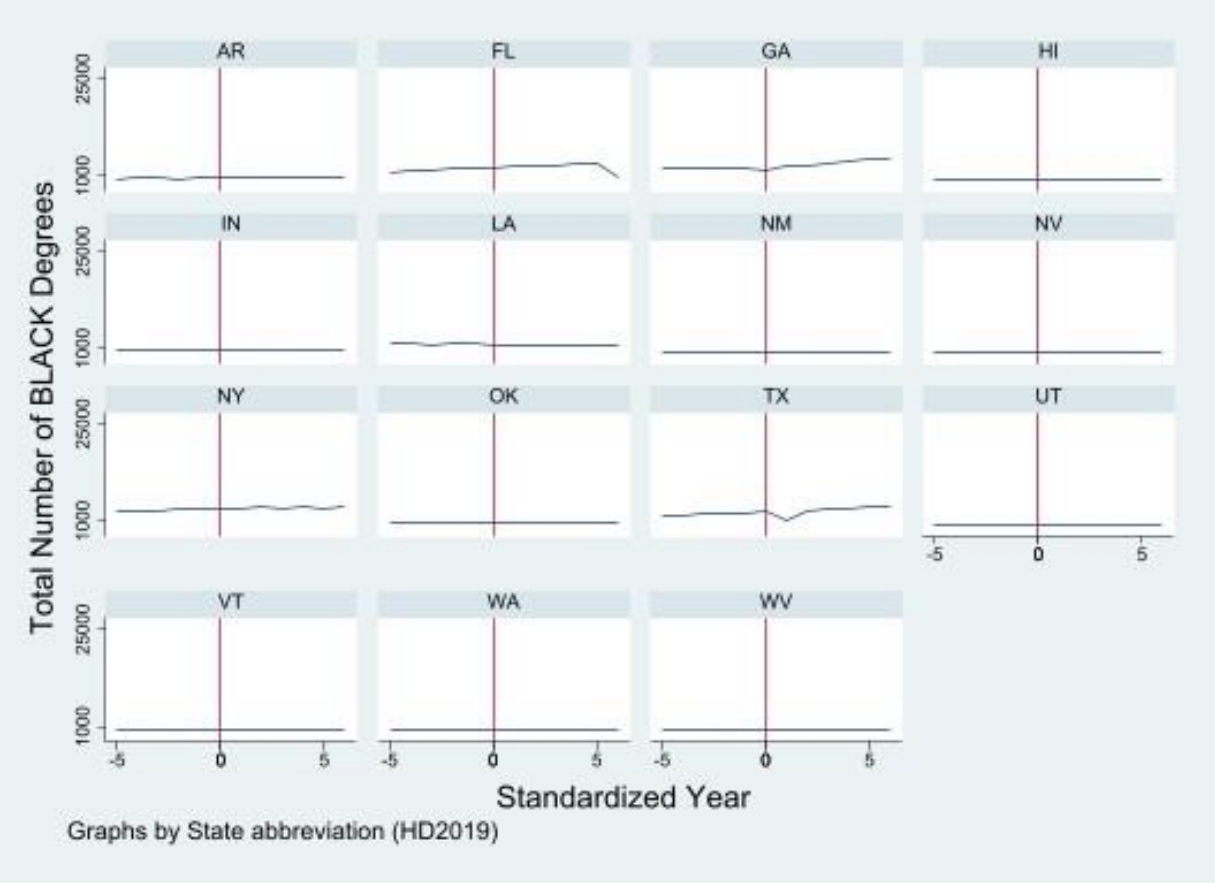
Graph of CCB States Before and After Treatment-Total STEM Degrees.



Note. These graphs were created using a standardized treatment year. A random intervention year was applied to control states to distinguish the before and after treatment periods.

APPENDIX G

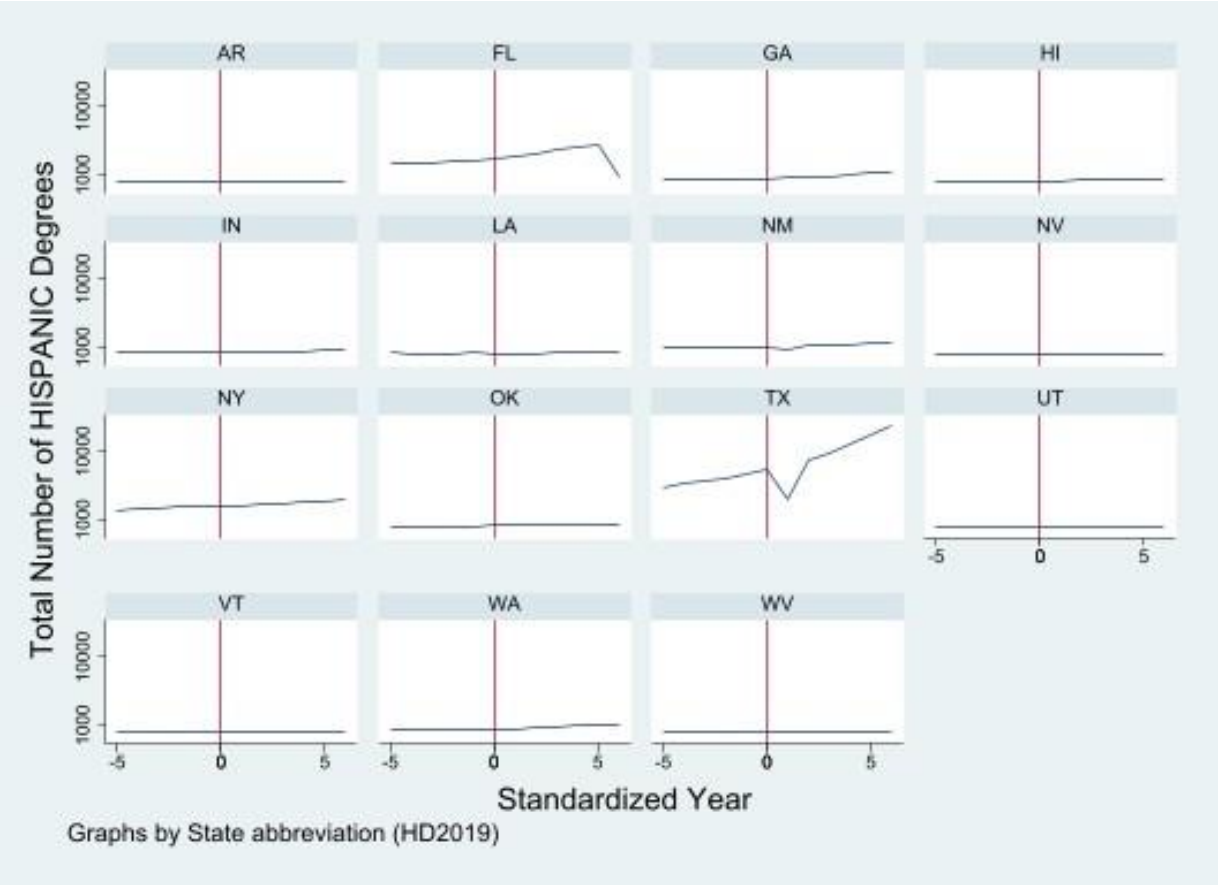
Graph of CCB States Before and After Treatment-Black STEM Degrees.



Note. These graphs were created using a standardized treatment year. A random intervention year was applied to control states to distinguish the before and after treatment periods.

APPENDIX H

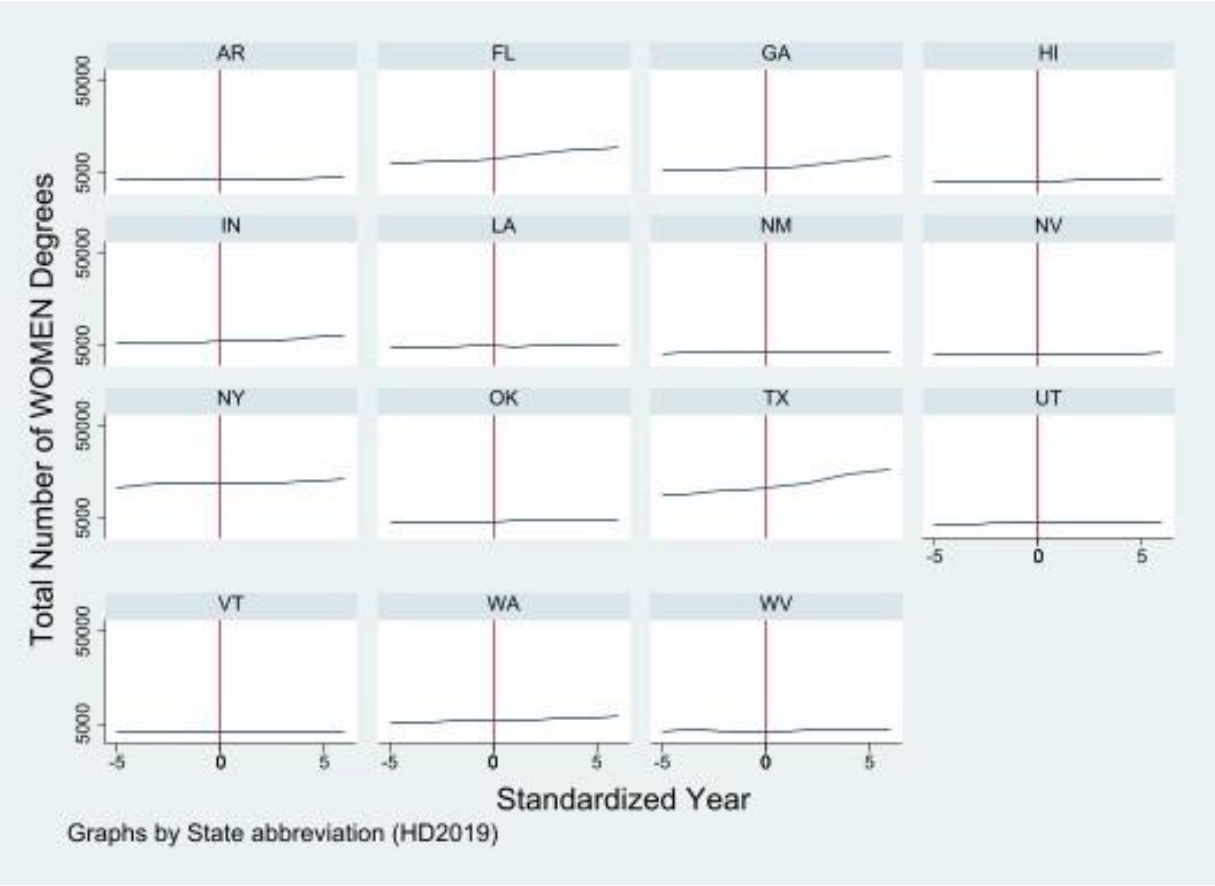
Graph of CCB States Before and After Treatment-Hispanic STEM Degrees.



Note. These graphs were created using a standardized treatment year. A random intervention year was applied to control states to distinguish the before and after treatment periods.

APPENDIX I

Graph of CCB States Before and After Treatment-Women STEM Degrees.



Note. These graphs were created using a standardized treatment year. A random intervention year was applied to control states to distinguish the before and after treatment periods.

APPENDIX J

Articles Identifying CCB States

State	Year	Article			
Arkansas	1998	Russell (2010)	Fulton (2015)		
California	2014		Fulton (2015)	Soler (2019)	Fulton (2020)
Colorado	2010	Russell (2010)	Fulton (2015)	Soler (2019)	Fulton (2020)
Delaware	2016			Soler (2019)	Fulton (2020)
Florida	2001	Russell (2010)	Fulton (2015)	Soler (2019)	Fulton (2020)
Georgia	1997	Russell (2010)	Fulton (2015)	Soler (2019)	Fulton (2020)
Hawaii	2007	Russell (2010)	Fulton (2015)	Soler (2019)	Fulton (2020)
Idaho	2018		Fulton (2015)	Soler (2019)	Fulton (2020)
Indiana	2004	Russell (2010)	Fulton (2015)	Soler (2019)	Fulton (2020)
Louisiana	2001	Russell (2010)	Fulton (2015)		Fulton (2020)
Michigan	2012		Fulton (2015)	Soler (2019)	Fulton (2020)
Minnesota	2003	Russell (2010)	Fulton (2015)		
Missouri	2018			Soler (2019)	Fulton (2020)
Nevada	1998	Russell (2010)	Fulton (2015)	Soler (2019)	Fulton (2020)
New Mexico	2004	Russell (2010)	Fulton (2015)	Soler (2019)	
New York	1996	Russell (2010)	Fulton (2015)		
North Dakota	2004	Russell (2010)	Fulton (2015)	Soler (2019)	Fulton (2020)
Ohio	2018			Soler (2019)	Fulton (2020)
Oklahoma	2004	Russell (2010)	Fulton (2015)	Soler (2019)	Fulton (2020)
regon	2019			Soler (2019)	Fulton (2020)
South Carolina	2018			Soler (2019)	Fulton (2020)
Texas	2003	Russell (2010)	Fulton (2015)	Soler (2019)	Fulton (2020)
Utah	1992	Russell (2010)	Fulton (2015)	Soler (2019)	Fulton (2020)
Vermont	1993	Russell (2010)	Fulton (2015)	Soler (2019)	
Washington	2005	Russell (2010)	Fulton (2015)	Soler (2019)	Fulton (2020)
West Virginia	1989	Russell (2010)	Fulton (2015)	Soler (2019)	Fulton (2020)
Wisconsin	2011		Fulton (2015)		
Wyoming	2019			Soler (2019)	Fulton (2020)