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Early College High School, Dual Enrollment, Traditional College, and Time to Obtain a 2-Year Degree

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
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the review committee have been made.

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MS, California Polytechnic State University, San Luis Obispo, 1994

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Project Study Submitted in Partial Fulfillment

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Abstract

Early college high school (ECHS) and dual enrollment programs offer opportunities for students to work toward their 2-year degree while still in high school. The problem for this study was that the ECHS and dual enrollment programs had not been compared to see if they facilitated 2-year college degree completion compared to one another and to a traditional college program. The problem was urgent because there was a need to evaluate two different ECHS screening methods, assuming significantly less time to degree completion for the ECHS students. The purpose of this quantitative project study was to determine if the time to 2-year degree completion was different for the ECHS, dual enrollment, and traditional college students. Bloom's taxonomy was used in consideration of differences in complexity of thinking between the three groups of students. Using a convenience sample of 208 archived records, the research question compared the mean time in months to degree completion for the three groups. A Kruskal-Wallis H-Test revealed that the ECHS students (n = 128) completed their 2-year degree in significantly less time (mean rank [mr] = 16.00) than the DE (n = 31, mr = 61.66, $p <$ .005) and traditional (n = 49, mr = 63.34, $p <$ .005) students. Because the significant difference was found, a chi-square test of homogeneity was used to evaluate an academic matrix (AM) and non-AM screening processes for ECHS students. A significant negative association was found for the AM group, resulting in a policy recommendation to continue the ECHS program with a modified application process to replace the AM screening with an orientation approach for ECHS students. Positive social change is achieved when students are placed appropriately in programs that facilitate expeditious degree completion while maintaining high academic standards.

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Section 1: The Problem

The Local Problem

In the United States, only 33% of full-time students are able to obtain an associate degree in 3 years (National Center for Education Statistics, 2020a). The time to associate degree completion is increased to 6 years if the student is part-time (Shapiro et al., 2016). Nationally, early college high school (ECHS) programs are used to decrease the time to degree obtainment (D'Anna et al., 2019; Grubb et al., 2017).

The purpose of this project study was to determine the time to associate degree completion for ECHS academy graduates compared to dual enrollment graduates and traditional graduates of the Community College of the Central Coast (CCCC pseudonym) and to determine which applicant screening process leads to the most students completing their associate degrees during the ECHS academy. The CCCC provided three programs of instruction: the ECHS Academy Program, the Dual Enrollment Program, and the Traditional Program. The CCCC ECHS Academy Program was designed to provide all associate degree courses while students were in high school. The CCCC Dual Enrollment Program was designed to allow students to take some courses in high school and then complete the associate degree after high school graduation. The CCCC Traditional Program was designed for students to start and complete their associate degree after high school graduation.

Nationally, the goal of the ECHS programs is to increase credit accumulation, improve college access and enrollment, and improve degree obtainment (What Works Clearinghouse, 2017). Furthermore, various ECHS programs offer college courses to

high school students during high school to speed the completion of postsecondary degree obtainment (Morgan et al., 2018). Over the last 4 years, the CCCC started to develop partnerships with area high schools to capitalize on these ECHS programs.

High school academies are schools within schools that link students to additional, structured resources to foster academic success (National Career Academy Coalition, 2019). The academies are financed with additional support services that may include scheduling students in cohorts, supervised study halls, and academic and career counseling not normally offered to the traditional student population (Hackmann et al., 2018). Recently, high schools have merged ECHS programs and academies into ECHS academies to use the advantages each brings (Loveland, 2017). The K to 12 ECHS Academy With a Matrix (AWM pseudonym) and the 9 to 12 ECHS Academy Without a Matrix (AWOM pseudonym) were two local high schools that started ECHS academies with CCCC. The academies used additional resources of student cohorts, counseling, and study halls with collegiate tutors to decrease the time to degree completion of an agriculture business (AGBS) associate degree from the CCCC. In this study, I used the term ECHS academy to differentiate between the academy-based ECHS programs from other ECHS programs that predominately offer dual enrollment courses without the additional support inherent in the academy program.

While ECHS programs have also been referred to as concurrent enrollment, dual enrollment, or dual credit programs, their essential function is to provide the opportunity for students to receive college credit while they are still enrolled in high school (Edmunds et al., 2017; Lauen et al., 2017). There is a myriad of ways ECHS programs can work. At

the CCCC, there were two types of ECHS programs: the ECHS Academy and Dual Enrollment and the Traditional Program where students began college after high school graduation.

1. ECHS academies allow students to complete all CCCC coursework required to complete a specific associate degree by the end of their senior year of study at their high school campus. ECHS academies are structured to provide additional support to students in cohorts generally focused around a career sector (Fletcher et al., 2019; Malin & Hackmann, 2019). The academy students follow a predesignated, regimented pathway of courses taken together with their peers, leveraging the feeling of community, coupled with administrative support and counselor guidance to provide successful outcomes (Hackmann et al., 2018; Malin & Hackmann, 2017). The ECHS academies were the focus of this study.
2. Dual enrollment courses allow students access to take individual CCCC courses taught on the high school campus by college professors or by high school teachers who have demonstrated subject matter competency and qualifications. Students can select courses of interest. These students may not receive additional support to navigate the collegiate process or the rigor of the coursework. These courses are not part of a predetermined pathway.
3. Traditional students take their first college course after high school graduation.

Each of these programs had advantages and disadvantages.

The Problem

In 2013, the state legislature in a western state delivered an educational grant, proposing the development of a partnership between industry, a community college, and a high school district to focus on developing an educational model that could prepare students for industry needed careers requiring an associate degree (California Career Pathways Trust - Career Technical Education, 2019). The CCCC ECHS academies were incorporated into a grant-winning proposal, and within 2 years, the K to 12 AWM and the 9 to 12 AWOM had instituted the program partnering with an industry partner, the Agriculture Unlimited Company (AUC pseudonym), and the CCCC to provide associate degrees in crucially needed areas in agriculture.

While students were initially recruited to the ECHS academies using an interest-based application inquiring of a candidate's desire to participate in the ECHS academy and the AGBS major, the AWM as a K to 12 institution additionally screened participants using an academic matrix (AM) of attendance, grade point average (GPA), math aptitude scores, and English aptitude scores of eighth graders to recruit students with a greater aptitude for collegiate rigor (Kassarnig et al., 2017). The AWOM was only a high school district; therefore, it did not have access to the information needed to complete an AM for eighth graders. Therefore, the AWOM only used an interest-based application in its applicant screening process. The interest-based application screened for noncognitive factors, including desire to be a part of a group or team and subject matter interest, which can affect student success (Farruggia et al., 2018). While each ECHS academy recruited students interested in participating, the AWM was, in addition, able to screen candidates

by examining students' academic records. Understanding if using students' academic records as an additional screening tool is indicative of having more students complete their associate degree during the ECHS Academy would be beneficial to future student success.

In 2013, the CCCC ECHS Academy students in a large county in a western state enrolled in the first CCCC ECHS Academy to complete an Associate of Science Transfer Degree Pathway by the time they graduated from high school. In the fall of 2019, additional local high schools considered participating in an ECHS academy and the dual enrollment model (Bonds & Swanson, 2019; Swanson, 2020). As CCCC academy programs were gaining in popularity and the existing CCCC academies were using two different applicant screening processes, it was prudent to understand the postsecondary time to degree completion of each program and if the different screening protocols the CCCC academies used to select academy program participants affected the number of students who completed their associate degrees during the ECHS Academy.

The problem was that although ECHS academies have been in place at the local site for 8 years, the time to associate degree completion of the academies compared to dual enrollment and traditional programs had not been analyzed. According to the president of CCCC and the vice principal of AWM, compounding this problem of having a lack of data on the time to degree completion from each ECHS program, the different screening processes used by the academies to select participants had not been evaluated for their efficacy in selecting the best candidates as determined by associate degree completion rates. The gap in practice was the lack of data analysis of the time taken to

degree completion of the ECHS academies compared to dual enrollment and the traditional programs as well as the lack of data analysis regarding which applicant screening process leads to the more students obtaining associate degrees during the ECHS academy. As the CCCC and other community colleges continue to develop ECHS programs, this analysis would provide needed data to make evidence-based decisions on the effectiveness of those programs. The evidence-based research could allow schools to focus their limited financial resources on areas that will provide the greatest return on investment.

Rationale

ECHS programs are increasing in popularity at CCCC and around the nation (D'Anna et al., 2019). Nearly 25% of CCCC's student population is below the age of 18 (Community College of the Central Coast Public Enrollment, 2018). One reason for the popularity of dual enrollment in the western state where the programs are occurring is that funding is provided to both the high schools and the community college for providing dual enrollment courses (Education Commission, 2019). While each entity is currently receiving grant funds for providing the ECHS academies, the financial statutes governing the pathway partnerships end on January 1, 2022, leaving academies without future funding (Education Commission, 2019). Even with this in mind, due to the success of the ECHS program, CCCC is considering adding additional academy and dual enrollment programs and continuing the programs that have been started.

While it is possible the college, high school, and industry collaborations that exist due to the ECHS programs will be legislated to continue, there is no guarantee the

programs will be financed in the same manner, if at all, given the current economic climate (California Legislative Analyst's Office, 2020). Regardless of how the academy and dual enrollment programs may be financed, California state law has regulated that K to 12 students do not have to pay for their public high school education (California Code of Regulations, 2020). As the ECHS program moves forward, it is unlikely students will shoulder the financial responsibility for their college courses taken during the ECHS program participation. The cost will be paid by either the high school, the college, or both. It is prudent to determine the success of the CCCC's current academy program to ensure the CCCC and their high school partners use the program that provides the best return on investment.

The purpose of this project study was to determine the time to associate degree completion for ECHS academy graduates compared to dual enrollment graduates and traditional graduates of the CCCC and to determine if using an AM in addition to an interest-based application leads to more students completing their associate degree during the ECHS academy. A quantitative study was conducted at CCCC to determine if the postsecondary time to earn an associate degree differs based on the use of the ECHS Academy Program, the Dual Enrollment Program, or the Traditional Program. I also investigated the applicant screening process to determine which process leads to more students completing their associate degrees during the ECHS academy.

Definition of Terms

The responsibility of education in the United States lies with the individual states and local education agencies (U.S. Department of Education, 2017). Therefore,

individual states develop their unique vernacular when describing programs, initiatives, and issues creating differences in terminology when looking at programs through a holistic, national lens (Grubb et al., 2017). The following is an attempt to clarify the terminology used in this study.

Academy: High school academies are small learning communities within the high school that link selected students to additional, structured resources to foster academic success (Hackmann et al., 2018; National Career Academy Coalition, 2019). In this study, I used the term ECHS academy when describing an ECHS program that is organized in an academy structure. I focused on the postsecondary time to degree completion of the ECHS academy compared to other programs.

California Career Pathways Trust (CCPT): California Assembly Bill 86 created a grant program that developed partnerships between high schools, community colleges, and industry representatives to create curricular programs to prepare students for high-skill and high-wage careers (California Career Pathways Trust - Career Technical Education, 2019)

Concurrent enrollment: An ECHS program that allows high school students to earn college credit by taking a comparable high school affiliated course, which is normally taught by a high school instructor (Early College - Community College of the Central Coast, n.d.).

Dual enrollment: An ECHS program that allows high school students to take college courses and earn college units while attending high school (An, 2013). In 2012, dual enrollment college courses started at the CCCC. These college courses are generally

taught by college professors at the high school campus (Blankenberger et al., 2017; Early College - Community College of the Central Coast, n.d.). Dual enrollment has also been referred to as dual credit. Dual enrollment was the first program that compared its time to postsecondary degree completion with the ECHS academy.

Early college high school (ECHS): An overarching term describing a program that offers the possibility to start a student's collegiate career and accrue college credit while still enrolled in high school, allowing a student to earn a high school diploma and up to 2 years of college credit towards an associate degree (Early College High School, 2019; Edmunds et al., 2017).

Higher order thinking skills (HOTS): Complex intellectual thinking, as described by Bloom's taxonomy of analysis, synthesis, and evaluation, is needed to be successful in postsecondary education (Casagrand & Semsar, 2017; Shalaby & Milad, 2017).

Postsecondary education: The educational level that follows the high school secondary education or a general education development (GED) certificate and generally results in the student earning a diploma, certification, or degree (Through Education, 2019). Postsecondary education can include colleges, vocational schools, and the military. The CCCC is a postsecondary education institution that provides certificate and associate degree programs.

Traditional community college: This program describes students who start their postsecondary education after either a high school diploma or a GED certificate had been completed (Juszkiewicz, 2020). The traditional program was the second program in this

study that was compared to the ECHS Academy to determine the time to postsecondary degree completion.

Significance of the Study

As additional resources are used to fast-track students through college using ECHS academies, it would be prudent to determine if the Academy Program is effective at delivering associate degrees faster when compared with the Dual Enrollment Program and the Traditional Program, particularly at a time when the CCCC is contemplating expanding their academy offerings. Understanding the programs' postsecondary time to degree completion would provide insight into the most appropriate application of finite resources. Once the program with the fastest postsecondary time to degree completion is determined, the CCCC can begin to promote and use that program more effectively. Also, understanding the applicant screening process that leads to more students completing an associate degree from the ECHS academies can help direct future applicant screening processes to be as effective as possible.

Understanding which program provides the fastest postsecondary time to degree completion can benefit the community college by providing the greatest return on investment in academy, dual enrollment, and traditional programs. High school students can choose to participate in the program that will be the most effective delivery of a postsecondary degree based on their unique circumstances. As students achieve their educational goals in a timelier manner, society can benefit from less financial aid debt as well as a population who is earning at greater levels compared to similarly aged peers without postsecondary degrees (Phelps & Chan, 2016). Also, the CCCC can meet its goal

of creating career development options for the community, and industries can benefit by receiving a quality workforce to fill high-demand employment needs (McLaughlin et al., 2018). In addition, the college may improve its understanding of time-to-completion of associate degrees and work to improve the success rate of degree obtainment in 2 years (Bickerstaff et al., 2017).

Research Questions and Hypotheses

To study the postsecondary time to degree obtainment in the ECHS Academy Program, the Dual Enrollment Program, and the Traditional Program at CCCC, the following research question was developed:

Research Question (RQ)1: What is the difference in the mean time to obtain an associate degree between ECHS Academy students, Dual Enrollment students, and Traditional students?

$H_0$1: There is no significant difference in the mean time to obtain an associate degree between ECHS Academy students, Dual Enrollment students, and Traditional students.

H_a1: There is at least one group significantly different in the mean time needed to obtain an associate degree between ECHS Academy students, Dual Enrollment students, and Traditional students.

By examining the length of time needed for each of the three groups to achieve an associate degree after high school graduation, I was able to examine if there is a difference between them. A simple analysis of variance (ANOVA) compared the means of the three variables to determine if there was a significant difference between the

programs, and a post hoc test determined where the differences, if any, occurred. The results provide credible data to determine the postsecondary time to degree completion.

The two ECHS academies used different screening processes to evaluate potential participants. AWOM evaluated an interest application that its candidates completed focusing on the noncognitive factors of desire to be a part of a group or team and subject matter interest. In addition to the interest application mentioned above, AWM evaluated an AM of attendance, GPA, math aptitude scores, and English aptitude scores to determine which candidates from the eighth grade were qualified for the high school's ECHS academy. While the HOTS described in Bloom's taxonomy are used in college courses, younger grades tend to use foundational levels of remembering and understanding (Kusumoto, 2018). Thus, using an AM with eighth grade students may not be indicative of readiness for collegiate rigor or inclusion in an ECHS academy as they may not possess the HOTS required for the academic rigor of college.

RQ2: What is the difference between the proportion of students successfully obtaining the associate degree at an ECHS academy that uses an academic screening matrix compared to one that does not?

$H_0$2: There is no difference between the proportion of students successfully obtaining the associate degree at an ECHS academy that uses an academic screening matrix compared to one that does not.

*H*a2: There is a difference between the proportion of students successfully obtaining the associate degree at an ECHS academy that uses an academic screening matrix compared to one that does not.

A chi-square test for homogeneity (test of two proportions) was applied using SPSS Version 27. The two groups studied included the students who were accepted into an ECHS academy based on an interest application and the students who were accepted into an ECHS academy based on an interest application and the AM. The test of two proportions determined if there is a difference between the two groups on the dichotomous variable of AGBS associate degree obtainment.

Review of the Literature

Bloom's Taxonomy as the Theoretical Foundation

In this study, Bloom's taxonomy was used as the foundation to determine the impact that HOTS may have on the successful placement of participants into ECHS programs. However, it was important to review the literature as well as the education practices to understand the context of Bloom's taxonomy being applied in this manner. In 1956, a committee of educators led by Bloom developed a sequential system of classifying learning and cognitive abilities (Bloom et al., 1956). Bloom suggested that learning occurs in stages and could be ranked from the least intensive to the highest order of thinking skills. The initial order of cognitive abilities, from lowest to highest, was knowledge, comprehension, application, analysis, synthesis, and evaluation. In 2001, Bloom's taxonomy was revised, creating a new order of cognitive abilities: knowledge, understand, apply, analyze, evaluate, and create (Anderson et al., 2001). The main differences in the revised version were the updated verbs intended to dynamically describe the levels of learning, changing the synthesis level to the create level, and

prioritizing the create level as the highest order of thinking where the learner would produce new or original work.

Bloom's taxonomy posited that learners must develop foundational knowledge in a subject area before they can progress to high levels of understanding to demonstrate HOTS and mastery of that subject (Bloom et al., 1956). Bloom's taxonomy, newly revised, suggested the sublevels in the knowledge dimension that change in complexity also demonstrate HOTS (Anderson et al., 2001). These sublevels are factual knowledge, conceptual knowledge, procedural knowledge, and meta-cognitive knowledge. As Bloom's taxonomy has been applied, it seems that younger secondary students tend to be educated in the lower foundation levels on the taxonomy or the more simplistic levels in the knowledge dimension (Kusumoto, 2018).

The CCCC (2018) requires all student learning outcomes to be developed using the four highest levels of Bloom's taxonomy and encourages the higher use of the knowledge dimension. Students must demonstrate HOTS to receive credit for the course. If students need instruction based on the lower levels of Bloom's taxonomy, it is assumed the students would be educated in either introductory college course work or secondary education. The applicants of the AWM and the AWOM Academies were committing to enroll in the programs and therefore enroll as an AGBS major at the CCCC before starting high school (Swanson, 2020). While students may have had a perception of their career goals at this young age, these students were enrolling in the CCCC before completing their secondary education, so it was prudent to understand if they possessed the HOTS to be successful. As only one of the academies attempted to determine

students' capacity for the HOTS required for collegiate rigor through the AM, understanding the association between the entrance requirements of the academies and the AGBS associate degree completion rate was important.

Review of the Broader Problem

I conducted a review of the literature using digital libraries and research databases. In the literature review, I focused on professional, peer-reviewed literature focusing on the HOTS of high school and community college students. The search terms and phrases used in this literature review were *academic matrix, academies, Bloom's taxonomy, college-ready, collegiate rigor, community college, concurrent enrollment, dual credit, dual enrollment, early college high school, higher order thinking, postsecondary education,* and *student success.* The searches were conducted using Walden University's digital library utilizing EBSCO, Education Source, ERIC, Sage Journals, Thoreau, and other educational databases as well as local websites. Google Scholar was also used for publications not included in the databases above.

The Broader Problem

The broader problem considered was how effective the younger students in the ECHS Academies would pursue the collegiate rigor the CCCC courses demanded. I looked through a lens of Bloom's taxonomy as a framework and applied it to each of the groups being studied: the ECHS Academy students, the Dual Enrollment students, and the Traditional students. In his taxonomy, Bloom theorized that the younger a student's age, the less likely they would exhibit the HOTS required in the highest levels of thinking or the more complex levels of the knowledge dimension (as cited in Agarwal, 2019;

Anderson et al., 2001). Thus, younger students participating in the ECHS academies and dual enrollment programs may be at a disadvantage. Also, because younger students may not possess the HOTS required for collegiate endeavors, I investigated the value of an academic matrix to make screening decisions for the ECHS academies.

As the time to an associate degree completion was the success factor studied, it was prudent to review the literature that makes educational institutions successful. A holistic focus on educational factors of success was needed to define the overall parameters success could be viewed in as well as the positive practices and the challenges that influenced success. As there were three groups in the study, I looked into the literature that described the factors that positively or negatively affected the success of each. Understanding what makes each program successful as well as how each program overcomes challenges that could affect that success may lead to future studies that attempt to determine which factors lead to the speedy completion of associate degrees.

Bloom's Taxonomy in Secondary Education

Piaget posited that the final stage of an individual's cognitive development begins at the age of 12 years old (as cited in Cherry, 2020). Teens tend to process information using the amygdala portion of their brain, which primarily processes one's emotional decision-making capacity (Fetterman et al., n.d.). The abstract and theoretical reasoning required for the highest levels of Bloom's taxonomy are beginning to emerge but will not be fully formed until the age of 25 years (Fetterman et al., n.d.). While the higher levels of Bloom's taxonomy are beginning to be introduced after middle school, the higher-level application of the HOTS tends to increase in the last 2 years of high school (Deller,

2019). Even though higher levels of Bloom's taxonomy can be found in secondary education, the rigorous application of the curriculum occurs as students get older, and they have a greater mental capacity.

Bloom's Taxonomy in the Academy Program

While it could be argued that secondary students may not possess the HOTS required for collegiate rigor, it seems possible to provide additional resources to assist with the transition. Academies provide students with additional resources that can be leveraged for greater student success (Hackmann et al., 2018). The resources may come in the form of smaller cohorts, tutoring support, or academic counseling. Academies also tend to develop a greater sense of community where students attend and participate at a higher level (Hemelt et al., 2019). These factors of support and participation assist the students and provide them with the means to apply HOTS at a higher level and master the higher levels of Bloom's taxonomy more readily.

The AWM at the study site elected to use an AM coupled with the student's interest application to prioritize student acceptance into their academy. The student applications are evaluated during the applicants' eighth grade year as to which students will be selected for CCCC ECHS Academy participation. Vijayakumar et al. (2018) suggested that this evaluation may be occurring too soon in the student's brain development. Not only is the prefrontal cortex starting to develop after age 12, but an individual's ability to engage in high levels of the social-cognitive processes that affect cognitive perspective is beginning to develop at this time (Vijayakumar et al., 2018). The AWOM was unable to use an AM. In this study, I determined if using an AM in addition

to an interest-based application leads to more students completing their associate degrees during the ECHS Academy.

Bloom's Taxonomy in the Dual Enrollment Program

The students who participate in dual enrollment courses at AWM or AWOM are the same ages as those participating in the ECHS academies. Dual enrollment primarily differs from the ECHS Academy Program in that students are self-selecting the courses they would like to take without the luxury of additional support resources inherent in the ECHS Academy Programs (Swanson, 2020). According to the vice principal of AWM, dual enrollment students are aided with the registration process, but they are not provided any additional tutoring or other support services that academy students receive.

As academy and dual enrollment students in the ECHS programs are the same ages, the students are ranked similarly according to Piaget's development theory, so the students should each be equally prepared for the HOTS that is expected in collegiate courses (Girgis et al., 2018). However, it could be argued that as dual enrollment students are provided the same level of resources as traditional community college students and the dual enrollment students are navigating the postsecondary system, they are applying HOTS. The dual enrollment students are obligated to research potential courses, understand how they may assist in reaching their long-term goals, and perform at a level that is appropriate for a college student (Lile et al., 2018). There is an argument that the students are applying the top three levels of Bloom's taxonomy by analyzing and organizing potential courses, evaluating and critiquing the courses that best meet their needs, and creating and planning a collegiate career.

Bloom's Taxonomy in the Traditional Program

Sixty-nine percent of high school graduates start postsecondary education after completing their secondary requirements (National Center for Education Statistics, 2020), and the largest group of first-year students at the CCCC is from this group (Community College of the Central Coast Public Enrollment, 2018). As students move into postsecondary schooling, biologically, their brains are more mature and have an increased capacity for cognitive function and HOTS (Bolton & Hattie, 2017). Adults reason with their prefrontal cortex, which controls rational thought (Fetterman et al., n.d.). Their capacity for creating, evaluating, and analyzing in a more complex manner tends to be more advanced than their younger secondary counterparts. The human brain finishes maturing about the 27th year of life (Franke et al., 2020), and the closer someone gets to that age, the more able they are to have the intellectual tools needed to master the HOTS inherent in the higher levels of Bloom's taxonomy as well as the more complex levels of Bloom's knowledge dimension required in collegiate rigor.

Higher-Order Thinking

Morgan et al. (2018) examined the impact of high rigor coursework on postsecondary success and found that participating in a rigorous secondary curriculum showed an increase in college enrollment, persistence, and even college graduation. While performance in the course can have a compounding effect, it was noted that participation alone could improve postsecondary success. Smith and Darvas (2017) investigated developing student autonomy by creating opportunities to expand HOTS for students. Allowing learners to evaluate and synthesize information demonstrates higher-

order thinking and can also be leveraged to intrinsically motivate the learner. However, it can be questioned if eighth grade students have been exposed to the high orders of Bloom's taxonomy and HOTS to make an AM appropriate. The second research question analyzed this issue.

Factors for Success

In 2018, although the participation in postsecondary education had increased, it has been noted that 33% of students enrolled in 2-year postsecondary degrees programs were able to complete the degree in 3 years, and only 62% of 4-year postsecondary degrees were completed in a 6-year timeline (National Center for Education Statistics, 2020). The American Association of Community Colleges determined that the completion rate for 4-year institutions was 26.6% (as cited in Juszkiewicz, 2020), and the National Student Clearing House found the 6-year completion rate to be 59.7% (as cited in Shapiro et al., 2019). The successful obtainment of a 2-year or 4-year degree according to their designated timetable seems unlikely at best.

Success is measured from many different perspectives. Colleges are deemed more successful as their rates of graduation improve (Barbera et al., 2020), and students consider completion of postsecondary degrees as a primary measure of success (Naylor, 2017). However, even as the United States has more students participating in postsecondary education, the rates of completion are not improving relative to the increase in enrollment and the time to completion remains constant (Caruth, 2018). There is a litany of potential causes that may be limiting student success.

Cognitive Factors

Students may be academically underprepared for postsecondary education. Mokher et al. (2019) found that while 86% of community college students felt prepared for collegiate rigor, 67% of those students were placed in remedial education courses, suggesting that students are not college-ready despite feeling ready. Many high school students participate in college preparatory courses that may not prepare them for college (Rodeiro & Shaw, 2020). Students may not possess or may not have been exposed to the HOTS colleges expect and therefore struggle toward degree completion. Each of the ECHS academies has developed screening tools as they are recruiting eighth grade candidates to participate in their prospective high schools. The AWM uses an AM as a screening tool for its eighth grade entrance candidates to find individuals with a greater potential for HOTS. Using the theoretical framework of Bloom's taxonomy explores HOTS and the level of HOTS in eighth grade rigor. The discrepancy between Bloom's taxonomy levels and the age of the eighth grade students is the reason for examining the association between entrance requirements of the academies and completion of the AGBS associate degree.

Noncognitive Factors

Several studies have suggested that noncognitive factors may be the key to student success. Farruggia et al. (2018) suggested that factors such as academic perseverance and learning strategies were substantive in student collegiate success. Xue et al. (2018) and Millea et al. (2018) proposed that academic success was directly tied to student attendance. Students who tenaciously attended college and developed the where-with-all to doggedly continue to complete degrees are more likely to be successful.

Bowman and Felix (2017) postulated that the more individuals identified with being a student, the more likely they were to persist until degree completion.

While recognizing a student's academic background can play a role in their postsecondary success, noncognitive elements affect it as well (Ramey et al., 2018). From the research cited above, there may be a significant association between entrance requirements and successful degree completion. As the AWOM academy recruiters were only able to identify noncognitive factors in their screening process, in this study, I aimed to determine the relative associate degree completion rate when compared to the academy students screened with the AM upon associate degree completion.

Factors That Challenge Success

Some students may possess the academic acumen to do well in college, but they may not have the experience to navigate a postsecondary world. Villares and Brigman (2019) contend many students do not possess the transition knowledge and skills to convert to a postsecondary education model. They may be intelligent college students who are unaware of the college culture (Coleman et al., 2018). Most secondary schools provide the academic structure for students, while that structure is essentially built by students themselves in the collegiate environment. Not understanding how the structure is developed can challenge students unaccustomed to navigating the collegiate experience (Wilson et al., 2019). Programs like the ECHS program have been developed to provide a semblance of the college culture before the postsecondary experience. As not every student participates in ECHS, this study will also examine the degree obtainment success

of students who were not exposed to the collegiate culture until they enrolled in the CCCC.

Not all students unfamiliar with the collegiate experience struggle through their degree obtainment. Wang et al. (2018) posited student success was based on the social capital students received in the forms of academic interaction with institutional agents and career advisors (Lynch & Lungrin, 2018). Students who did not have access to advisors had a harder time navigating through degree completion. Students did not seem to have role models to lead them through college. Also, Kassarnig et al. (2018) found many students were guided through their collegiate experience by their peers. Unfortunately, since students tend to gather in homophilic groups, they tend to be mentored by those in similar situations. ECHS Academies attempt to provide students resources such as additional counseling and academic collaboration and are provided the opportunity to complete a community college degree before graduating from high school. Students participating in Dual Enrollment courses may also participate in additional academic advising. But not all students participate in those programs, and this study will investigate the postsecondary time to degree completion for academy students, Dual Enrollment students, and Traditional students.

Although there are differentiated reasons why students are unable to complete a postsecondary degree, there seems to be a common thread throughout suggesting high schools could better prepare their students both academically (Beattie et al., 2018) and by developing non-cognitive elements that have been shown to assist in postsecondary success; not only in degree obtainment but the time it takes to achieve that degree (Gore

et al., 2019). One way many states have tackled the challenges of timely degree completion is by starting the collegiate process earlier for many students through various forms of ECHS programs (Loveland, 2017). This study investigated if that strategy is viable for the CCCC.

ECHS Programs

In an attempt to improve the speed for postsecondary degree acquisition, ECHS programs have attempted to provide collegiate content, units, and college-going culture to students in high school educational programs with the intent of expediting the completion of postsecondary degrees (Blankenberger et al., 2017; Morgan et al., 2018; Myers & Myers, 2017). Research has shown that participants in ECHS programs improve secondary and postsecondary success by increasing the high school graduation rate, college participation rates, and postsecondary degree obtainment (Fink et al., 2017; What Works Clearinghouse, 2017). ECHS differs from Advanced Placement (AP) courses as with ECHS, collegiate units are immediately awarded after course completion. AP courses require the students to take a summative test demonstrating collegiate content was mastered before collegiate units are awarded.

It is challenging to communicate accurate terminology regarding ECHS programs as every state uses different definitions and the United States Department of Education has not delivered definitive definitions (Lauen et al., 2017). For this study, the following terminology applies:

Dual Enrollment: Any CCCC course that is taught by the faculty of the CCCC to students enrolled in both high school and the CCCC. Students select the courses they would like to take.

ECHS Academy: A group of CCCC ECHS students who are enrolled in an ECHS Academy to complete an associate degree while in high school. Students are tied into a particular major and must take a prescribed set of courses.

Successes of ECHS Programs

Nationally, ECHS programs appear to be effective in lowering the time until degree completion. In 2017, Blankenberger et al. analyzed two groups of 8,000 students to determine the impact of participating in a dual credit program in Illinois. When comparing dual credit participants to non-participants, it was found ECHS participants were more likely to obtain a baccalaureate degree, 28% to 19%, respectively (Blankenberger et al., 2017). Also, in 2017, Fink et al. investigated what happened to students who took community college dual enrollment courses in high school and found that 88% enrolled in postsecondary education, 46% of the students who enrolled at community college received a college credential within 4 years, and 64% of the students who enrolled in 4-year colleges completed a college credential within 5 years.

D'Anna et al. (2019) examined the collegiate success of students who had participated in a health profession-focused dual enrollment program. In the study I showed that 62.3% of the graduates achieve a 2 or 4-year certificate within 2 or 4 years respectfully. In addition, only 26.5% of the students achieved a degree in the health profession field. As the original CCPT grant mandated developing ECHS academies in

conjunction with industry partners, the degrees obtained may not necessarily be in the originally supported industry cluster, suggesting an inherent challenge of 8th-grade students needing to decide on their career field at such a young age. Future research beyond this study could investigate this issue.

In 2016, Phelps & Chan examined the relationship between the completion of dual credit courses in high school and college and career success. Thirty percent of the high school graduates possessed dual credits and had significantly better outcomes in college course completion rates, second-year retention, and career earnings. The success was most significant when the collegiate dual credit course was taught by a high school instructor. As some 4-year transfer colleges have exhibited concerns about the rigor of courses taught by high school instructors (Blankenberger et al., 2017), the CCCC committed to providing college professors to teach the ECHS Academy and Dual Enrollment students. Future studies could investigate this concern.

In a mixed-methods study, Edmunds et al. investigated how ECHS prepared students for a successful collegiate experience (2017). In the study I showed that early college high schools were not only graduating from high school at a higher rate, but they were better prepared for the HOTS of collegiate rigor. The schools in the study mimicked the CCCC ECHS Academy program as courses were taught by college instructors on the high school campus and the students were working in associate degree programs. This study attributed the success of the program “by instilling academic behavior, teaching students the college process, and helping students take ownership of their learning”

(Edmunds et al., p. 137, 2017). The academies at AWM and AWOM provide similar experiences.

The What Works Clearinghouse Intervention Report (2017) studied the effectiveness of ECHS programs on high school completion, college participation rates, and postsecondary degree achievements. In the study I found that the students in ECHS programs were 7% more likely to complete high school, 15% more likely to enroll in college, and 25% more likely to complete a postsecondary degree than the students who started their collegiate experience after high school graduation. The study did not stipulate what type of degree or certificate warranted postsecondary completion within 6 years of completing high school. As the CCCC served a large population of rural students in a large California County, it seemed prudent to better understand how the ECHS screening processes improve degree completion rates as the ECHS programs may be expanded and leveraged for more success based on sound local evidence.

Grubb et al. studied the beneficial impact that dual enrollment has on students at a community college in Tennessee (2017). The research suggested dual enrollment benefitted the college as those participants were 3.4 times less likely to require remediation, 2.5 times more likely to graduate in 2 years, and 1.5 times more likely to graduate in 3 years compared to non-participants.

Challenges for ECHS Programs

In a 2017 study, Lauen et al. investigated the impact of Early Colleges on secondary and postsecondary outcomes in North Carolina. Within 6 years of starting high school, the probability rate of the average comparison students completing an associate

degree was .008 compared to the predicted probability of the ECHS students of .225. The location of the ECHS sites was important as the schools housed on community college campuses likely accounted for the positive impact. As the AWOM and AWM are not in the same town as the CCCC, the college decided it was a better use of limited resources to provide instruction on the high school site and not bus the students to the college multiple days each week.

Myers and Myers studied the effect the participation in dual enrollment had on the six-year baccalaureate graduation rate (2017). While students with dual enrollment units realized higher six-year graduation rates, this was partially due to the credit selectiveness of different institutions. The institutions that accepted all dual enrollment units were more successful in their graduation rates compared to institutions that were more selective in their credit acceptance. Credit acceptance will not be an issue for the ECHS Academy students as they transfer with a completed degree from the college that is accepted in its entirety. Some 4-year colleges do not accept all dual enrollment courses, however, this is unlikely because the CCCC collegiate transcripts do not differentiate courses based on their delivery method. Students starting their collegiate experience after high school will not be exposed to this potential issue as all courses will be delivered via the traditionally accepted program.

Success and Challenges of ECHS Academy Programs

While there are different ways to deliver ECHS programs, the partnership created within CCPT between the CCCC, local high schools, and the agriculture industry focused on delivering the initiative through an academy-based enterprise. For nearly 50 years,

career-focused high school academies siloed interested students within smaller learning communities and provided additional resources to not only improve high school success rates but also to create an interest in a potential workforce for the local industry (National Career Academy Coalition, 2019). Graduates of some career academies have experienced an 11% increase in annual earnings, sustained over 8 years after high school graduation (Social Programs That Work, 2017). The AWM and the AWOM academies were developed with these concepts in mind.

Fletcher et al. compared the levels of student engagement between career academy students and traditional comprehensive high school students (2019). Fletcher suggested the career academy students had higher levels of cognitive and emotional engagement when compared to their counterparts. This was due to the common career content the students demonstrated curiosity about. Both the AWM and the AWOM recruited students with an interest to work in the agriculture industry. They assumed that interest would catalyze student engagement and success.

Hackmann et al. (2018) studied career academies and their ability to provide a structure and promote college and career readiness. The clustered students follow a regimented career pathway of courses taken together with their peers, leveraging the feeling of community, coupled with administrative support and counselor guidance to provide successful outcomes. The AWM and AWOM also provided additional student support by supplying the students with exclusive program directors, guidance and career counselors, and academic tutors apart from the rest of the student body (Community College of the Central Coast, 2020).

Hemelt et al. (2019) examined how academies affect student outcomes and create transitional opportunities after high school. The study showed that academy enrollment increased the high school graduation rate by 8% and boosted rates of college enrollment. Participation in the academies improved attendance and engagement, academic performance, access to college-level courses, and access to applied industry knowledge.

Malin and Hackmann (2017) studied the effectiveness of utilizing academies to enhance students' transition to colleges and then careers. The academies are structured to provide additional support to siloed students generally focused on a career sector. The authors showcased the contribution community leaders provided in promoting college and career preparation. When compared to non-participants, Song and Zeiser (2019) found ECHS program participants to be more successful in the following areas: 7% more likely to enroll in any college, 19% more likely to enroll in a community college, and 12% more likely to complete a postsecondary degree. Students participating in ECHS Academies had additional resources that made this success more likely.

Academies certainly face challenges. If the academies are career-based, industry stakeholders must be recruited to ensure the educational relevance of the curriculum and to provide the chance for work-based educational opportunities (Hackmann et al., 2018). At a minimum, it will take personnel time to build and maintain these relationships. Lanford and Maruco (2019) suggest the biggest challenge that academies face is the additional resources needed to implement and maintain them. Hemelt et al., (2019) determined the average cost for student participation in the academy was $1,540, per student per year above the cost of non-academy education. There will likely be an

increase in associate degrees for the CCCC, and it should be noted the AUC and other agricultural firms may see an increase in needed employees. However, it needs to be considered if the revenue increase in additional associate degrees is worth the investment in the ECHS Academies. This study endeavors to determine if the academy structure being used is an effective program in delivering associate degrees when contrasted with Dual Enrollment students and Traditional Program students. A true cost-benefit analysis could be explored in future studies.

Success and Challenges of Dual Enrollment

Successes of dual enrollment have been applauded for 20 years in some states in the United States (Edmunds et al., 2017). While the primary emphasis of dual enrollment is to increase college unit attainment, therefore associate degree obtainment, the program has also created success at the secondary level. Students who participate in dual enrollment are 16% more likely to stay in high school and 7% more likely to graduate when compared with their traditional counterparts (What Works Clearinghouse, 2017). This success may be attributed to the motivation students perceive as college students in high school or the independence the participants recognize (Fink et al., 2017).

According to the research conducted by Zeiser (2017), dual enrollment students are nearly 20% more likely to attend a community college and 7% more likely to attend any college when compared to the control group. As students participate in dual enrollment courses, not only do they better understand the collegiate culture and expectations, but they also experience the rigor firsthand. As they find success, they identify themselves as college students (Bowman & Felix, 2017). The ability to transfer

from secondary education to postsecondary education is not a huge chasm as they, at some level, have experienced it.

Dual enrollment participants tend to complete associate degrees at a higher rate when compared to the control group of students. Dual enrollment students are about 22% more likely to complete an associate degree in 2 years and 18% more likely to complete an associate degree in a six-year time frame (What Works Clearinghouse, 2017; Zeiser, 2017). Dual enrollment students have completed an average of 15 units before enrolling at the CCCC and have about 25% of the associate degree completed by their high school graduation (Swanson, 2020).

There are challenges in dual enrollment. Nationally, students average 23 units of college credit by the time they have graduated (Zeiser, 2020). As the cost for dual enrollment courses is usually not passed along to the student, this can amount to substantial savings for the learner (Loveland, 2017). However, it must be conceded there are costs borne in a dual enrollment Program. A study for the American Institutes for Research found the cost of a dual enrollment program to be $955 more per student per year than the traditional high school (Zeiser, 2019). The early stages of ECHS and dual enrollment were funded through foundational funding, like the Bill and Melinda Gates Foundation (Song & Zeiser, 2019), or government funding like the CCPT grant (California Career Pathways Trust - Career Technical Education, 2019). These funding sources are less available, leaving the financing to the high schools or the colleges that are supporting dual enrollment (Education Commission, 2019). While dual enrollment seems to improve the CCCC associate degree success rate, it is crucial to determine the

effectiveness of the program to determine its long-term viability. The Dual Enrollment is the first group to be examined for time to associate degree completion in this study and contrasted with the ECHS Academies.

Success and Challenges of Traditional Students

In 2018, the National Center for Education Statistics (2020a) determined there were 5.85 million students attending community colleges, 57% of whom are female. Of the first-time, full-time undergraduate students who started at community colleges in the fall of 2015, 33% completed their associate degree in 3 years, and the retention rate those 2-year community colleges is 62% (National Center for Education Statistics, 2020a). As community colleges are only required to report student graduation data 3 years after initial college enrollment, it is challenging to determine how many students complete a 2-year degree in 2 years by examining national data.

Community colleges can be attractive choices for students as they are centrally accessible, inexpensive, and offer flexible scheduling (Dougherty et al., 2017). Sixty percent of community college students are participating on a part-time level, as the flexible course scheduling allows them to do so (National Center for Education Statistics, 2020b). Students can continue their education while working full-time or while taking care of family members. However, as this flexible scheduling allows individuals to continue their education, it also compounds the challenges of time to degree completion.

Public community colleges are certainly inexpensive educational programs. In California, twelve units are the minimal units for a full-time student and will cost $1,104 at a community college, $5,742 at a California State University, and $12,630 and a

University of California (Savidge, 2018). Studies have found that students who borrow for their education complete fewer units, and the issue is compounded more over time (Baker & Doyle, 2017). Participating in a more inexpensive educational program and needing to borrow less may increase the rate of unit obtainment and certainly has an impact on social welfare if students can complete their educational goals with less debt. Community colleges can provide a pathway to that success.

Regardless of the reasoning to start an educational experience at a community college, some institutions have better levels of success than others. While there seem to be various influencing factors on a college's completion success, student preparedness, and program clarity are significant factors (Mokher et al., 2019). Student preparedness seems to separate into two areas: academic preparedness and college transition preparedness.

To prepare for academic success, some community colleges have developed Student Success Courses designed to explain the academic skill set needed to be successful in postsecondary courses (Kimbark et al., 2017). Other schools have created *early intervention* protocols designed to provide additional resources to academically struggling students (Rios, 2019). Teachers can communicate the student's needs into the intervention software, and the student is quickly linked to supportive resources.

Students who better understand the college experience and more easily transition to a collegiate culture tend to achieve their educational goals more quickly (Beattie et al., 2018). Many colleges have completed bridge programs to assist with this knowledge (Gonzalez Quiroz & Garza, 2018). Bridge programs are designed to help new students

build on their previous academic experience and relate it to the new collegiate experience. They may provide academic performance tips, tours of the campus for students and their families, as well as provide an introduction to student life. The goal is to give new students a chance to create an identity as college students (Bowman & Felix, 2017) and develop the confidence needed to be successful (Bickerstaff et al., 2017).

The most successful community colleges seem to communicate the programmatic options students can choose from and they provide a concise pathway to completion (The Campaign for College Opportunity, 2020). For many students, there seem to be a plethora of educational options to pursue (Jenkins et al., 2018). Schools can communicate which major fits with student aspirations and can assist the student get started with their educational endeavors. Once students get started, providing a clear, sequential pathway to completion allows students to chart their entire journey. The CCCC has recognized the need for student academic preparedness as well as program pathway clarity and has provided resources to meet this need.

The largest challenge community colleges likely face is they have a multifaceted role compared to most postsecondary educational institutions. One institution may provide programs in academic and occupational subjects, credentials, including certificates and 2 and 4-year degrees, community support including remedial education, job training education, dual enrollment programs, and serve as a site for community events (Dougherty et al., 2017). This role is complicated as “community colleges are open campuses that accept all students regardless of prior educational background” (Aunai, 2018, p. 119). Also, community colleges generally have a larger percentage of

socio-economically disadvantaged students as well as non-traditional students compared to 4-year institutions (Armbrust, 2019; National Center for Education Statistics, 2020b; Rios, 2019). There is a need to determine the effectiveness of the Traditional Program upon time to degree completion and makes it a worthy comparison to ECHS Academies and Dual Enrollment Programs.

Implications

There were four possible genres of projects that could have been delivered through this study: Evaluation Report, Curriculum Plan, Professional Development / Training Curriculum and Materials, and a Policy Recommendation with a Detailed Position Paper. The final selection of the project was based on data analysis.

As I was studying the time to postsecondary degree completion rates for the CCCC, I realized a curriculum plan was unlikely to become the project deliverable. Each of the college's majors would have different curriculum needs. Even focusing on the Academies' AGBS major, there were approximately 20 courses that would need curriculum support, creating excessive complexity to the project. If the data did lead to a curriculum plan, the developed project could be used as a template for others to follow.

The second research question speaks to the recruitment protocols of the two current ECHS Academies and, in particular, investigated if the AM was a helpful addition to the interest application. As I examined the recruitment and candidate screening processes of the two academies, it was discovered the AM did not lead to more students completing associate degrees. This understanding could lead to a professional

development training project to educate Academy personnel on developing application portfolios or evaluating them.

Regardless of the outcome of the study, an evaluation report could be delivered. Evaluation reports share key findings with internal and external stakeholders (National Council for Voluntary Organizations, 2019). They are designed to share insightful information that can be used by the governing body to make decisions. For example, the UAC has partnered with other colleges to develop other ECHS academies in different rural agricultural communities. If it was learned the ECHS academies improved the time to postsecondary degree acquisition, an evaluation report study could edify their efforts and encourage other academies to be created.

The primary difference between an evaluation report and a policy paper is the latter brings recommendations based on the study results. If the AM proved helpful, AWM may be interested in helping students improve in the areas the AM is based upon to improve the success of their academy. The AWOM may strive to build better partnerships with their feeder schools to either obtain the AM information or encourage additional academic development on those campuses. If the AM did not improve the success of the AWM in degree completion, then it would be prudent to end that practice and focus on recruiting students solely based on their interest in participating in an academy. A policy can be developed regardless of the result of the study.

Summary

The problem motivating this study was although ECHS Academies have been in place at the local site for 8 years, the time to associate degree completion of the

Academies compared to Dual Enrollment and Traditional Programs had not been analyzed. Compounding this problem, the different screening processes used by the academies to select participants had not been evaluated for their efficacy in selecting the best candidates as determined by associate degree completion. Investigating this problem allowed the CCCC to better understand the associate degree obtainment rates of each program to facilitate decisions regarding the expansion of ECHS Academies.

As student selection in the academies takes place before the start of high school, students are placed in collegiate classes at the start of high school. As collegiate courses are rigorous, Bloom's taxonomy was applied as the theoretical framework inquiring at what level do high school students possess the HOTS to thrive in a collegiate setting. As one the AWM uses an AM to screen potential candidates in the eighth grade, Bloom's taxonomy can be applied to question if, at that young an age, the student had developed enough HOTS to make the AM a viable selection tool.

Section 2 included the study's methodologies, including the research design and approach, the setting and population, the data collection and analysis, the assumptions, limitations, scope, and delimitations, as well as the protection of the participants' rights. Section 3 provided the project deliverable, and section 4 provided the reflections and conclusion of the study.

Section 2: The Methodology

Introduction

The purpose of this project study was to determine the time to associate degree completion for ECHS Academy graduates compared to Dual Enrollment graduates and Traditional graduates of the CCCC and to determine which applicant screening process led to more students completing their associate degrees during the ECHS Academy. To be successful in a collegiate atmosphere in an ECHS Academy or Dual Enrollment course, students need to be prepared for the collegiate rigor the experience entails (Sheffield, 2018). Collegiate rigor can sometimes be demonstrated by the contemplative process demonstrated by the student and often can be demonstrated by the HOTS described in the upper levels of Bloom's taxonomy, which are normally demonstrated in postsecondary education (Smith & Darvas, 2017). Using the higher levels of Bloom's taxonomy to develop and establish learning outcomes has been shown to improve test scores and mastery of the subject matter (Casagrand & Semsar, 2017). Using a framework based on Bloom's taxonomy can determine if students possess the aptitude to be successful in a collegiate environment.

Research Design and Approach

This quantitative study had a quasi-experimental design using secondary data with all student identifiers removed. By examining the mean times needed for each of the three groups to achieve an associate degree, a cause/effect relationship between the ECHS Academy, Dual Enrollment, and Traditional student groups and time to degree completion was derived. This understanding applied directly to the problem statement of

the lack of analysis of the time to associate degree completion of the Academies compared to Dual Enrollment and Traditional Programs

In this study, I also sought to determine if the ECHS acceptance screening process affected the success rate of the ECHS academy students. A chi-square test for homogeneity was applied using SPSS Version 27. The two groups studied were students who were accepted into an ECHS academy based on an interest application, and students who were accepted into an ECHS academy based on an interest application and an AM composed of attendance, GPA, math aptitude scores, and English aptitude scores. The test of two proportions determined if there was a difference between the two groups on the dichotomous variable of degree obtainment.

Research Design

The research design used in this study was quasi-experimental. Quasi-experimental research generally differs from experimental research as the groups are unable to be randomly assigned. I used routine secondary data provided by the CCCC Office of Institutional Effectiveness (OIE). All student identifiers were removed from the data. The data were collected from three different student groups: ECHS Academy students, Dual Enrollment students, and Traditional students starting college after graduation from high school. Because students self-selected their group, a quasi-experimental design was the best choice to study the relationship between participant group and associate degree completion.

To study the three different groups, a standard time frame was set. In 2013, the dual enrollment students and the traditional students graduated from high school and

enrolled at the CCCC. Also, in the fall of 2013, the ECHS academy students enrolled at the CCCC. The number of months it took students after their high school graduation to complete an associate degree was used as the measurement of success, referred to as time to associate degree completion. According to the What Works Clearing House, part-time students pursuing an associate degree may take up to 6 years for degree completion (as cited in Shapiro et al., 2016). Therefore, in this study, I investigated the postsecondary time to associate degree completion after 6 years, concluding in 2019.

Research Design and Approach Justification

The CCCC had never evaluated the time to degree completion for the ECHS Academies and contrasted the data with the Dual Enrollment and Traditional Programs, so the data were missing. The ECHS Academies had never examined the effectiveness of the individual schools' screening processes to focus on students who are most likely to be successful in completing the program and obtaining their associate degree. Using archived secondary data and a quantitative method had advantages. The use of archived secondary data allowed for objectivity in the data collection. The archived secondary data also allowed for anonymity in the study, thereby creating a layer of protection for the rights of the participants. This analysis provided data to address a local concern regarding the time to degree completion for the ECHS Academies, Dual Enrollment, and Traditional Programs thereby filling a gap in the CCCC's practice.

How the Research Design Derives From the Problem

In the study I focused on the postsecondary time to degree completion of the ECHS Academy and how it compared to the Dual Enrollment Program and Traditional

Program at CCCC. All ECHS programs carry an additional financial cost to deliver (Lanford & Maruco, 2019), and, according to the president of CCCC, the CCCC was obligated to finance its portion. Therefore, it was important to determine the success of the ECHS Academy Program and determine if the college and its secondary partners are investing limited funds prudently. The information was also valuable when determining which ECHS programs should be expanded to improve the rate of associate degree completion.

As the ECHS academies were entering the 7th year of existence, it was also time to investigate the screening processes used to recruit their yearly cohort of participants. Each ECHS academy had more applicants than they had room for in their cohort. As some students were turned away, it was crucial to accept those who would be most likely to complete the rigorous course work to obtain a postsecondary degree. Understanding if the AM affects student success plays a role in the strategy each ECHS academy uses to recruit future students.

Setting and Population

The study's student population for RQ1 was CCCC associate degree graduates. There were three types of students included in the study population:

1. ECHS, AWM, and AWOM who started the Academy in September 2013 and graduated from high school in 2017.
2. Dual enrollment students who graduated from high school in 2013 and continued their associate degree coursework at CCCC.

3. Traditional program students who graduated from high school in 2013 and enrolled at the CCCC to complete an associate degree.

The study's population for RQ2 was all of the students accepted into the AWM and AWOM academies in September 2013. Everyone who fit the above parameters was included in the population. There was not a random selection process.

Sampling Strategy

In this study, I used secondary data from CCCC's OIE department. All students who met the above parameters were used in the study's census sample. The college's OIE collected the data, removed all personal identifiers, and provided the data to me in a Microsoft Excel file.

Population Size

I conducted a priori G*Power analysis for an ANOVA: fixed effects, omnibus, one-way test with a power of .95, and an alpha of .05 for RQ1. G*Power indicated a minimum sample size of 66 would be needed for all groups combined (Faul et al., 2009). The dataset contained 128 students from the academy group, 31 students from the dual enrollment group, and 49 students from the traditional group. The total sample size exceeded the minimum sample size of 66.

Criteria for Participant Eligibility

To have a consistent sampling population, only schools that possessed an Academy Program, Dual Enrollment Program, and Traditional Program were used. The groups were selected from AWOM and AWM to study RQ1 and analyze the

postsecondary mean time to obtain an associate degree were CCCC graduates. The groups included

1. Students who started in the AWM or AWOM ECHS Academies in September 2013 and subsequently graduated from high school in 2017.
2. Students from AWM or AWOM who did not participate in an ECHS Academy but participated in Dual Enrollment, graduated from high school in 2013, and continued at the CCCC.
3. Students from AWM or AWOM who did not participate in an ECHS Academy or Dual Enrollment, graduated from high school in 2013, and then enrolled at the CCCC.

To study RQ2, all students who were enrolled in the AWM and AWOM Academies in September of 2013 were included.

Recruitment of Participants

The data are normally collected and stored by the college's OIE. Before receiving the data, all student personal identifiers were removed. The program manager of the OIE assigned an institutional research analyst (IRA) to collect the data from the CCCC archived database, identify AWM and AWOM students, code for anonymity, and prepare the data for analysis. As the secondary collected data came from routine sources and were coded for anonymity, informed consent was not required. For the student data to be included in the study, the students had to attend the AWM or AWOM. For RQ1, the student participants were CCCC graduates and identified as an ECHS Academy student,

Dual Enrollment student, or Traditional student. For RQ2, the students were identified as AWM or AWOM students who started the ECHS academy in the fall of 2013.

Characteristics of the Selected Population

In this study, I focused on students who had received an associate degree from the CCCC. According to the School Accountability Report Card, the AWOM was a public high school with an enrollment of 1,717 students in 2019-2020 (California Department of Education, 2021b). The student population was 93.8% Latino, and 87.4% of the total population was classified as socioeconomically disadvantaged. Nearly 8% of the town's population has obtained postsecondary degrees (U.S. Census Bureau, 2021b). The area's dominant industry is agriculture.

According to the SARC, the AWM was a public charter K to 12 school with an enrollment of 1,814 students, 575 of whom were in high school (California Department of Education, 2021a). The student population was 94.9% Latino with 86.9% of the total population being classified as socioeconomically disadvantaged. Twelve percent of the town's population obtained a postsecondary degree (U.S. Census Bureau, 2021a). The AUC partnered with the county department of education to develop the charter for the AWM as an opportunity to create a school for the children of their employees as well as to create a launching board for individuals interested in a career in the agriculture industry.

Many students in rural schools do not get exposed to a college-going culture, and their postsecondary participation is lower than their peers in urban or suburban areas; this challenge is exacerbated in socioeconomically disadvantaged and minority populations

(Dixon, 2017). These schools were selected to participate in the ECHS Academy by the CCCC to break the cycle and create postsecondary education opportunities. The AWM and AWOM were the only schools that possessed an ECHS Academy Program, Dual Enrollment Program, and Traditional Program and were, therefore, the ideal population to examine the postsecondary time to degree completion for all three programs.

Instrumentation and Materials

An instrument was not used in this study. I relied on routine secondary data, and instrumentation was not needed. The CCCC OIE assigned an IRA to provide the standard, anonymous data for the study from the college's database. The secondary data were based on students from the AWM and the AWOM schools who participated in CCCC courses either during their high school tenure or upon graduating. The data were provided as a Microsoft Excel file and entered into SPSS, Version 27 as required by the ANOVA and the Test of Two Proportions.

Data Collection and Analysis

The anonymous secondary data were gathered by the CCCC's OIE and delivered as a Microsoft Excel file. The data were stored on the district's secured server for a minimum of 5 years.

Data Required for the Research Questions

The secondary data required to answer this study's research questions were collected by the OIE using the CCCC records system. All students who were enrolled in the AWM and AWOM could be in the population. The following characteristics were identified for RQ1:

1. The populations' high school of origin (AWM/AWOM).
2. Enrolled in the ECHS Academy Program in September of 2013 (Y/N).
3. The date of participants' high school graduation:
    a. Dual Enrollment and Tradition Programs (June 2013).
    b. ECHS Academy Program (June 2017)
4. The date of the participants' first CCCC course.
5. The date of associate degree obtainment.

The following characteristic was identified for RQ2:

1. Enrolled and began an ECHS academy in September of 2013 (Y/N).

How Data Align With the Research Questions

The CCCC's records system was used to identify the participant's high school, their high school graduation date, as well as the timeline of participation in CCCC courses, including associate degree obtainment. RQ1 inquired about the differences in postsecondary time needed to complete an associate degree between ECHS Academy students, Dual Enrollment students, and Traditional students. The data obtained provided the information needed to analyze the differences in time until degree obtainment for each of the three groups, demonstrating alignment with the purpose of the study.

RQ2 looked at the association between the entrance requirements of the academies and the AGBS associate degree completion rates. As each academy uses different entrance requirements, analyzing the data regarding the two school's successes in AGBS associate degree obtainment demonstrated alignment between data and RQ2. In both cases, the data were used to answer the study's research questions.

Data Collection Process

An IRA in the OIE was selected to retrieve the secondary data from the CCCC records database. The IRA focused on participants from the AWM and AWOM from September 2013 to June 2019. The IRA identified the date of participants' high school graduation, their participation or lack thereof in the ECHS Academy in September of 2013, the date of the participants' first CCCC course, and the date students obtained an associate degree. The IRA also removed all identification markers and coded each student, thereby creating student anonymity. The coded data was sent to me in a Microsoft Excel file.

Procedure for Gaining Access to Secondary Data and Required Permissions

The selected IRA had access to the CCCC's records database to collect the study's secondary data. The needed data were included in the application to the CCCC's Institutional Review Board (IRB). The CCCC approved the research before the routine data was collected and transferred to me. A copy of this proposal was provided to the CCCC IRB. The CCCC IRB approval process took several weeks.

Nature of the Scale for Each Variable

Two statistical evaluations needed to be applied, one for each research question. RQ1 applied a one-way ANOVA. The dependent variable of time until associate degree obtainment was measured at the continuous level. There was one independent variable consisting of three categorical, independent groups. The groups were the ECHS Academy Program, the Dual Enrollment Program, and the Traditional Program.

RQ2 used the test of two proportions on two dichotomous variables. The independent variable was the entrance requirements of the ECHS Academies. The first category was the interest screening process used by the AWOM and the second category was the interest screening process coupled with an AM used by the AWM. The dichotomous dependent variable was associate degree obtainment with the categories of *yes* or *no*.

Data Analysis Plan

One-Way ANOVA

To answer the research question about the difference in the meantime to obtain an associate degree between ECHS Academy students, Dual Enrollment students, and Traditional students, a one-way ANOVA was used. A one-way ANOVA was used to determine if there was a statistically significant difference in the means of independent groups (Frankfort-Nachmian & Leon-Guerrero, 2018). An ANOVA only measures if groups are significantly different. The ANOVA does not reveal which groups are different and why they are different. Therefore, to determine which groups were different, a post hoc test was completed (Laerd Statistics, 2017).

Assumptions for the One-Way ANOVA. Of the six assumptions that must be met to consider validating the one-way ANOVA, three relate to the choice of study design, and three relate to how data fits into the ANOVA model (Laerd Statistics, 2017). First, there must be a dependent variable that is measured at the continuous level. The dependent variable for this study was time to associate degree obtainment, measured in months. Secondly, there must be an independent variable consisting of three or more

categorical, independent groups. This study examined ECHS Academies Programs, Dual Enrollment Programs, and Traditional Programs. The third assumption is the study should have independence of observations, meaning there is no relationship between the groups. This assumption was achieved by ensuring each group had different participants.

The final three assumptions can only be determined after the data is obtained. The fourth assumption is there should not be any significant outliers in the groups of the independent variable in terms of the dependent variable, time to associate degree obtainment. Outliers can harm results as they can disproportionally influence the mean of the group being investigated (Frankfort-Nachmian & Leon-Guerrero, 2018). The fifth assumption is the dependent variable should be normally distributed for each independent variable. Although the one-way ANOVA is considered robust to violations of normality, the Shapiro-Wilk test for normality is commonly used to test this assumption (Laerd Statistics, 2017). The final data-based notion is the assumption of the homogeneity of variances. The population variance of the independent variable should be the same. Unequal sample sizes can lead to unequal variances between the groups, potentially affecting this assumption. Having both unequal sample sizes and variances tends to affect statistical power and Type 1 error rates. Utilizing a random selection within a group to ensure sampling size consistency can minimize this issue (Rusticus & Lovato, 2014). If the sixth assumption gets violated, different calculations can be performed to normalize the variance.

To examine RQ1, SPSS was used to run the test on the one-way ANOVA. The ANOVA tested the null and alternative hypotheses by determining whether the group

means are different. If differences occur, a post hoc test will be performed to determine where the differences lie. So not only will I test if there are differences in time to complete an associate degree in the three groups being investigated, but if differences occur, I will be able to determine where they are.

Chi-Square Test for Homogeneity (Test of Two Proportions)

To answer the research question about the difference between the proportion of students successfully obtaining the associate degree at an ECHS academy that uses an AM compared to one that does not, a chi-square test for homogeneity was used. The chi-square test of homogeneity determines if there was a difference between the binomial proportions of two independent groups on a dichotomous dependent variable (Laerd Statistics, 2016). In this study, the chi-square test for homogeneity determined if there is a difference between group one, the academy recruiters using an interest application, and group two, the academy recruiters using an interest application and an AM upon the dependent variable of degree obtainment.

Assumptions for the Chi-Square Procedure. Four assumptions must be met to validate the chi-square test of homogeneity (Laerd Statistics, 2016). First, the test must include one independent dichotomous variable and one dependent dichotomous variable. The independent variable was the applicant screening processes used. Group one used an interest application as their screening process, and group two used an interest application and an AM in their screening process. The dependent variable was the obtainment of an associate degree, with the values of one for yes and zero for no.

The second required assumption is the independence of observations, meaning there is no relationship between the independent variable groups. The independence of observation was achieved by assuring there were different participants in each group, with no overlap. The third assumption is dictated by purposeful sampling. There were two groups of 70 people. The first group had the characteristic of using the interest application, and the second group had the characteristic of utilizing the interest application and an AM. This final assumption for the chi-square test for homogeneity is to have a sufficiently large sample size. The minimum sample size concerning expected frequencies is that all cells should have an expected count greater than or equal to five (Laerd Statistics, 2016). A sample size of 70 exceeded that standard.

To examine RQ2, SPSS was used to run the Test of Two Proportions. The test determined the binomial proportions as well as the difference in binomial proportions on the success category of obtaining an associate degree in agriculture business. By examining the success rate of the independent variable of entrance requirement of each of the academies, the population proportion was determined. When analyzing the differences of those binomial proportions, the statistical significance can be determined, and the null hypothesis will either be rejected or failed to reject.

Assumptions, Limitations, Scope, and Delimitations

Assumptions

Although the ECHS Academies are located at two different schools in two different districts, the individual Academies are similarly organized. Protocols and best practices were developed for the academies by the CCCC and the participating schools. I

assumed the protocols were used by each ECHS Academy, and they are were operationally effective.

The next assumption was CCCC instructors provided the same rigor in all courses whether they were ECHS Academy courses, Dual Enrollment courses, or courses taught on the college's campus to Traditional students. I assumed the standard of rigor was the same no matter where the courses were taught.

Finally, it was assumed the student in each group was typical of their age demographic. I assumed the groups were not recruiting gifted students with dramatically above the norm HOTS, that by their presence and participation, results could be skewed. No group should have a higher proportion of gifted students when compared to the norm.

Limitations

In the study I focused on two rural high schools associated with a single college in the western United States. Therefore, the results are not generalizable in other geographical locations or with other demographic groups. For example, the results may not apply to ECHS programs in urban high schools. Future studies could be employed to investigate additional locations and demographic groups.

Scope and Delimitations

As the study's scope was a local problem to be addressed, it met Walden's criteria for project studies. The scope was one college's examination of the time to associate degree completion of the ECHS Academy Program when compared to Dual Enrollment and Traditional Programs in two high schools in rural, agricultural areas. However, rural students in the western United States could vary from other locations. Utilizing a more

representative group of rural participants from other areas in the United States could better allow generalizing of findings to other rural populations.

For this study, I focused on the time to associate degree completion for the ECHS Academy Program, Dual Enrollment Program, and Traditional Program. A delimitation for the study was the exclusion of the different support structures of each of those groups. Considering the support services of each group and their impact on associate degree obtainment would have made the study less manageable and would have potentially obscured the intent of the research.

Limitations of Evaluation

The study's analysis was based on students from two rural high schools. As the local problem focused on the time to associate degree completion of the ECHS Academy, the Dual Enrollment Program, or the Traditional student Program, no comparisons can be made at other locations. Also, as ECHS Academies are specialized programs the recruitment protocols were being applied to, it would be challenging to make a comparison of this study's examination of entrance requirements to other academic programs.

Protection of Participants Rights

The study had several approaches for participant identity protection including my completion of the National Institutes of Health's *Protecting Human Research Participants course.* In addition, secondary data was used, and all students' personal identifiers were removed before data evaluation began, thereby protecting student identities. The data was stored electronically on the CCCC's secure server and will be

maintained for at least 5 years before being deleted. The CCCC's IRB approved the use of anonymous data. Approval was also provided by Walden's IRB (IRB approval #0422210738830).

Data Analysis Results

The following sections provided the analysis of the study's data. This analysis aligned the problem, theoretical framework, research questions, and hypotheses.

I conducted a priori G*Power analysis for an ANOVA: Fixed effects, omnibus, one-way test with a power of .95 and an alpha of .05 for RQ1. G*Power indicated a minimum sample size of 66 would be needed from all groups combined (Faul et al., 2009). The dataset contained 128 students from the Academy group, 31 students from the Dual Enrollment group, and 49 students from the Traditional group. To analyze similar group sizes, SPSS was used to randomly select 31 cases from the Academy and the Traditional groups. Utilizing similar sample sizes in the groups tends to improve statistical power and minimize Type 1 error rates (Rusticus & Lovato, 2014). The total sample size was 93, exceeding the minimum sample size of 66.

SPSS was used to run a Test of Two Proportions for RQ2. There were 62 students in the population in the group that was recruited using the interest inventory and the AM. There were 66 students in the population in the group recruited from the academy utilizing the interest inventory.

One-Way ANOVA

One-Way ANOVA Assumptions

The One-Way ANOVA relies on six assumptions. First, there must be one dependent variable that is measured at the continuous level (Hoekstra et al., 2012; Laerd Statistics, 2017; Troncoso-Skidmore & Thompson, 2013). Second, there must be an independent variable consisting of three or more categorical groups (Hoekstra et al., 2012; Laerd Statistics, 2017; Troncoso-Skidmore & Thompson, 2013). Third, the study should have independence of observations (Hoekstra et al., 2012; Laerd Statistics, 2017; Troncoso-Skidmore & Thompson, 2013). The fourth assumption is there should not be any significant outliers in the groups of your independent variable in terms of the dependent variable (Hoekstra et al., 2012; Laerd Statistics, 2017; Troncoso-Skidmore & Thompson, 2013). Fifth, the dependent variable should be normally distributed for each independent variable (Blanca et al., 2017; Laerd Statistics, 2017; Nahm, 2016). The sixth assumption is the homogeneity of variances (Hoekstra et al., 2012; Laerd Statistics, 2017; Wang et al., 2017).

Addressing the Assumptions

The first assumption states there must have one dependent variable that is measured at the continuous level. My study had one dependent variable that was measured at the continuous level; postsecondary time to associate degree obtainment, measured in months. The number of months to postsecondary degree obtainment ranged from zero to 72 months in the categorical groups.

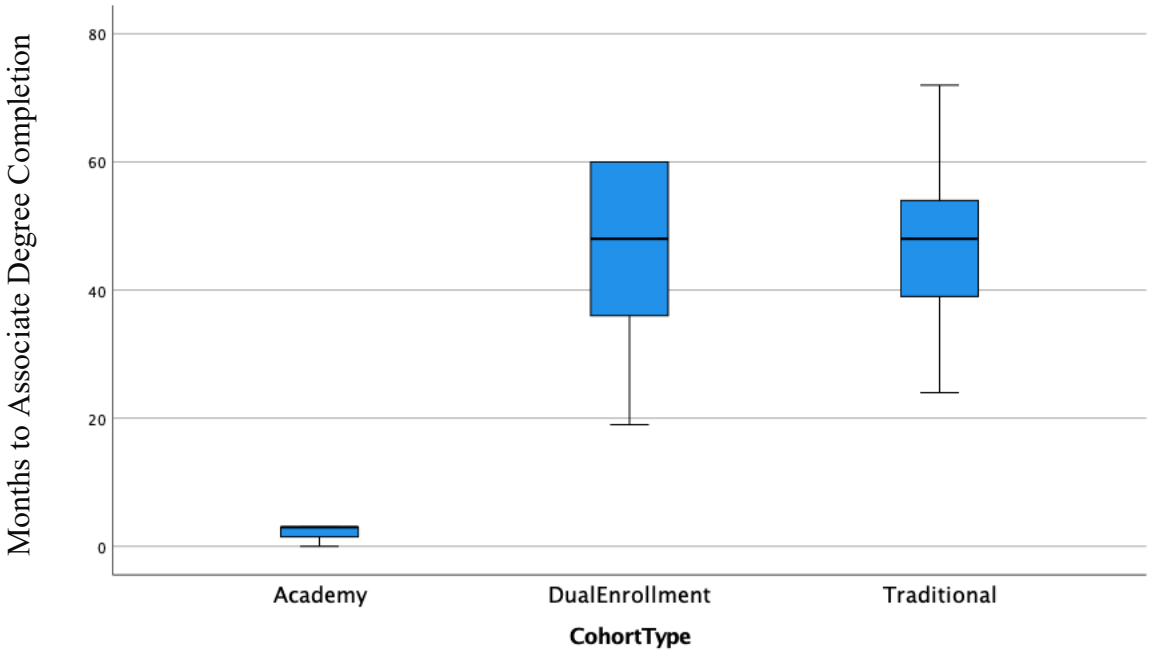
Secondly, the independent variable must be comprised of three or more categorical independent groups. My study had an independent variable comprised of the following three groups: ECHS Academy Program students, Dual Enrollment Program students, and Traditional Program students. The data set was sorted by each group, and the groups were categorized as a nominal, independent variable. The categorization was as follows: ECHS Academy=1, Dual Enrollment=2, and Traditional=3.

The third assumption is achieved by ensuring each individual cannot participate in more than one group, thereby guaranteeing the independence of observations (Laerd Statistics, 2017). Each student was de-identified. The data was sorted and cross-referenced to ensure students were only included in one independent, categorical group. Students who participated in the ECHS Academies were classified as such in the data. Students were placed in the Dual Enrollment group if they were not in the Academy but took at least one college course before their high school graduation in 2013. Students were classified in the Traditional group if they started at the CCCC without any collegiate courses before their high school graduation date in 2013. As the students were in differing categorical groups, independence of observations was achieved.

The fourth assumption is there should not be any significant outliers in the independent variables in terms of the dependent variable, time to associate degree obtainment (Hoekstra et al., 2012). Based on visual inspection of the boxplot for values greater than 1.5 box lengths, no outliers were found in the independent variables (see Figure 1).

Figure 1.

Boxplot of Different Programs on Time to Associate Degree Completion



The fifth assumption is the dependent variable should be normally distributed for each independent variable (Laerd Statistics, 2017). A Shapiro-Wilk test for normality is used to test this assumption. The significance level (ρ value) should be greater than .05 for all independent variables. Examining ρ values, only the ρ value (.140) of the Traditional variable was greater than .05 and therefore normally distributed. The Academy variable ρ value (.00) and the Dual Enrollment variable ρ value (.008) were less than .05, so, therefore, the data was not normally distributed, and the fifth assumption was violated

As the data distribution was not normal, the Kruskal-Wallis H-Test (KWHT) was used to replace the ANOVA as it is a rank-based nonparametric test that can determine if

there are statistically significant differences between the groups of the independent variable on the dependent variable, which is what RQ1 examined.

Kruskal-Wallis H-Test

Kruskal-Wallis H-Test Assumptions

The KWHT relies on four assumptions. First, there is one dependent variable that is measured at the continuous or ordinal level (Hazra & Gogtay, 2016; Kruskal & Wallis, 1952; Laerd Statistics, 2015). Second, there is one independent variable that consists of two or more categorical, independent groups (Kruskal & Wallis, 1952; Laerd Statistics, 2015; Ruxton & Beauchamp, 2008). Third, the study should have independence of observations (Kruskal & Wallis, 1952; Laerd Statistics, 2015; Ruxton & Beauchamp, 2008). Finally, it must be determined whether the distribution of scores for each group of the independent variables has the same shape or a different shape (Dolgun & Demirhan, 2017; Fan et al., 2011; Kruskal & Wallis, 1952; Laerd Statistics, 2015).

Addressing the Assumptions

The first assumption states there must be one dependent variable that is measured at the continuous or ordinal level. The dependent variable was postsecondary time to associate degree obtainment measured in months. Months to postsecondary degree obtainment is a continuous variable that ranged from zero to 72 months in the categorical groups.

Secondly, the independent variable must be comprised of two or more categorical independent groups. My independent groups were the ECHS Academy Program students, Dual Enrollment Program students, and Traditional Program students. The data set was

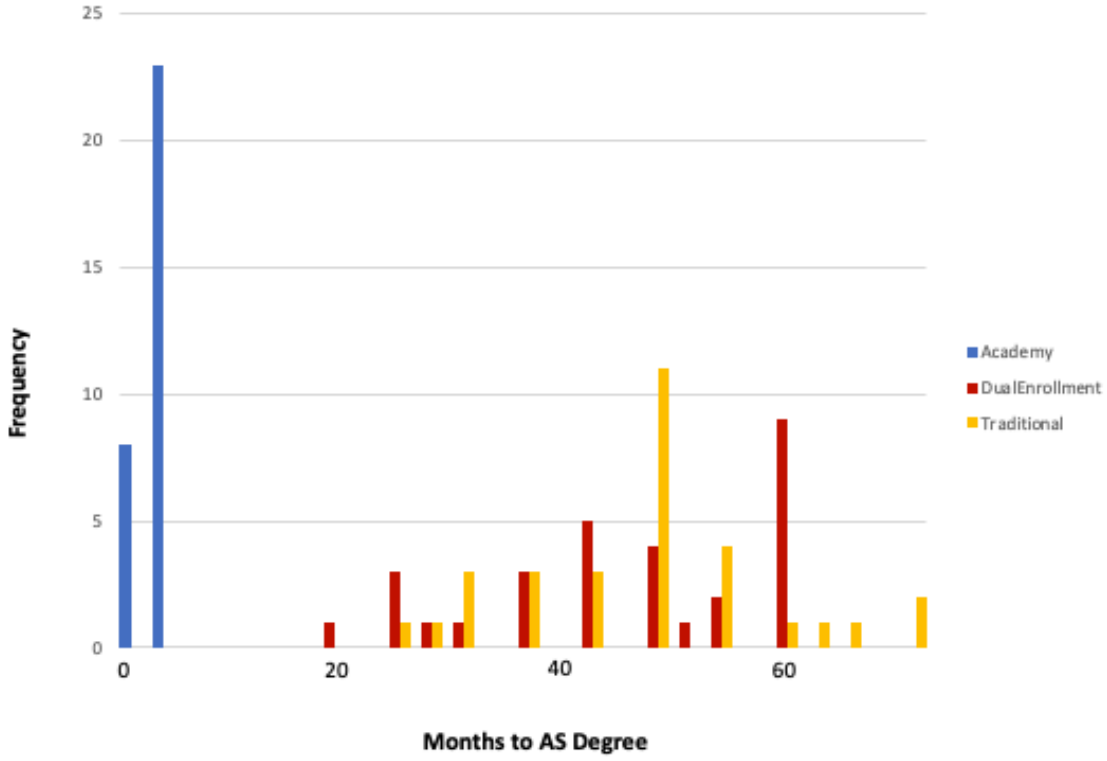
sorted by each group, and then the groups were categorized as a nominal independent variable. The categorization was as follows: ECHS Academy = 1, Dual Enrollment=2, Traditional=3.

The third assumption states there must be independence of observations so individuals cannot be in more than one group. This assumption was achieved by ensuring each of the groups had different participations, thereby guaranteeing the independence of observations. Each student was assigned an individualized random identifier. The data was sorted by the random identifier and then was cross-referenced to ensure each student was only included in one of the independent, categorical groups. As the students were in differing categorical groups, independence of observations was achieved.

The fourth and final assumption is determining the shape of the distribution of scores for each group of your independent variable. If the distribution shapes for each independent variable are the same and therefore have the same variability, the KWHT can be performed using the median scores of the independent variable (Laerd Statistics, 2015). If the distribution shapes of the independent variables differ, the KWHT can be performed by evaluating the mean ranks instead. Based on a visual inspection of the distribution shapes of cohort types shown in Figure 2, the shapes were not the same, and the mean ranks were used to perform the analysis.

Figure 2

Distribution Shapes of Cohort Type



Research Question 1

RQ1: What is the difference in the mean time to obtain an associate degree between ECHS Academy students, Dual Enrollment students, and Traditional students?

$H_0$1: There is no significant difference in the mean time to obtain an associate degree between ECHS Academy students, Dual Enrollment students, and Traditional.

H_a1: There is at least one group significantly different in the mean time needed to obtain an associate degree between ECHS Academy students, Dual Enrollment students, and Traditional students.

As an assumption for normality was violated, the data needed to be analyzed using the KWHT. The hypothesis based on the KWHT was as follows:

$H_0$1: The mean ranks of the groups of ECHS Academy students, Dual Enrollment students, and Traditional students are equal.

H_a1: The mean ranks of the groups of ECHS Academy students, Dual Enrollment students, and Traditional students are not equal.

A KWHT was conducted to determine if there were differences in Time to Associate Degree Completion between three cohort groups of participants of ECHS Academy students, Dual Enrollment students, and Traditional students. Distributions of Time to Associate Degree Completion scores were not similar for all groups, as assessed by visual inspection of Figure 2. The distributions of Time to Associate Degree Completion score were statistically significantly different between groups $\chi^2(2) = 62.797$, $\rho < .005$. Therefore, the null hypothesis was rejected since the mean ranks of the groups were not equal.

To tell how each group differed, pairwise comparisons were performed using Dunn's (1964) procedure. A Bonferroni correction for multiple comparisons was made with statistical significance computed at the $\rho < .0166$ (α / 3) level. This post hoc analysis revealed statistically significant differences in Time to Associate Degree Completion scores between the ECHS Academy (mean rank = 16.00) and Dual Enrollment (mean rank = 61.66) $\rho < .005$) and ECHS Academy and Traditional (mean rank = 63.34) ($\rho < .005$) groups (see Table 1). There were no significant differences between the Dual Enrollment and the Traditional Cohorts. The lack of significance was likely due to the infancy of the Dual Enrollment Program starting in 2012. This data

showed the Academy cohort completed an associate degree in significantly fewer months than either of the two other cohorts.

Table 1.

Pairwise Comparisons of Cohort Type

Sample1 – Sample 2	Test statistic	Standard error	Standard test statistic	[a] Sig.	[b] Adj. Sig.
ECHS Academy - Dual Enrollment	-45.661	6.779	-6.736	.000	.000
ECHS Academy – Traditional	-47.399	6.779	-6.983	.000	.000
Dual Enrollment - Traditional	-1.667	6.779	-.247	.805	1.000

Note. Each row tests the null hypotheses that the Sample 1 and Sample 2 distributions are the same.

[a] Asymptotic significance (2-sided tests) is displayed. The significance level is .05.

[b] Significance values have been adjusted by the Bonferroni correction for multiple tests.

Chi-Square Test for Homogeneity/Test of Two Proportions

There are four assumptions for the Chi-Square Test for Homogeneity. First, the test must include one independent dichotomous variable and one dependent dichotomous variable (Laerd Statistics, 2016). Secondly, independence of observations must occur (Laerd Statistics, 2016). Third, only certain sampling/study designs can be used with the Chi-Square Test (Laerd Statistics, 2016). The final assumption for the Chi-Square Test for Homogeneity is the sample must be sufficiently large (Laerd Statistics, 2016).

Addressing the Assumptions

To test for assumption one, one independent dichotomous variable and one dependent dichotomous variable were used. The screening process that the academies used served as a single independent dichotomous variable. This variable was classified as 1 = AM and an interest inventory used in the applicant screening process, and 0 = interest inventory was used in the applicant screening process. The dependent dichotomous variable was the obtainment of an associate degree. This variable was classified as 1 = associate degree completed and 0 = no associate degree completed.

The assumption of the independence of observations was accomplished by utilizing different groups from two different high schools. The CCCC OIE cross-checked student identifiers to ensure no students were participants of both groups. The groups were kept independent of each other.

The third assumption is based on the sampling design used with the Chi-Square Test for Homogeneity. As the research question was investigating an event that had occurred in the past, a retrospective purposive sample was used. The two groups were based on those recruited with the interest inventory and those recruited utilizing the interest inventory and the AM.

The final assumption for the Chi-Squared Test of Homogeneity is based on having a large enough sample size for the test to provide a valid result (Laerd Statistics, 2016). The minimum sample size required for each frequency should be greater than 5 (Laerd Statistics, 2016). The smallest expected frequency is 23.7, surpassing the

minimum sample size standard (See Table 2). All the assumptions for the Chi-Square Test for Homogeneity were confirmed and therefore, the test was valid.

Table 2.

ECHS Academy Cross Tabulation Statistics

ECHS academy		Associate degree		
		Not completed	Completed	Total
AWOM	Count	17	49	66
	Percent	25.8%	74.2%	100.0%
AWM	Count	32	30	62
	Percent	51.6%	48.4%	100.0%

Research Question 2

RQ2: What is the difference between the proportion of students successfully obtaining the associate degree at an academy that uses an academic screening matrix compared to one that does not?

$H_0$1: There is no difference between the proportion of students successfully obtaining the associate degree at an academy that uses an academic screening matrix compared to one that does not.

H_a1: There is a difference between the proportion of students successfully obtaining the associate degree at an academy that uses an academic screening matrix compared to one that does not.

Of the 128 students recruited into two ECHS Academies in 2013, 66 students were in the AWOM and were screened with an interest inventory, and 62 students were in the AWM and were screened through both an interest inventory and an AM. The students at each academy intended to obtain an associate degree within the 4 years (2017) of their high school tenure. Of the 66 students in the AWOM recruited using the interest inventory, 49 obtained an associate degree in May of 2017, and 17 did not. Of the 62 students of the AWM screened with the additional AM, 30 obtained their associate degree in May of 2017, and 32 did not (see Table 2).

The chi-square test of homogeneity tests the proportions between two groups communicated as a percentage. Of the 66 students recruited with the interest inventory, 74.2% received an associate degree, and 25.8% did not. Of the 62 students recruited with the interest inventory and the AM, 48.4% obtained an associate degree and 51.6% did not (see Table 2). Cohen's H ($\left|2 \cdot arcsin\sqrt{p1} - 2 \cdot arcsin\sqrt{p2}\right|$) was calculated to determine the effect size with .2 indicating a small-strength, .5 a-medium strength, and .8 a large-strength (Laerd Statistics, 2015).

The difference between the two proportions is calculated to assess the comparative effectiveness upon associate degree completion between the independent variables of the screening process used to recruit participants (Laerd Statistics, 2016). The difference in proportion was .742 - .484 = .258, with $C^2(1) = 9.045$, $\rho = .003$, $h = .540$. Since the $\rho < .05$, the null hypothesis is rejected. Therefore, there was a difference between the proportion of students successfully obtaining the associate degree at AWM (48.4%) that used an AM to screen students compared to AWOM (74.2%) that did not

use an AM to screen students. The AWOM without an AM had a higher percentage of students completing an associate degree compared to the AWM, which used the AM. The difference in significance had a medium-strength effect size.

Limitations of Research Findings

The research findings had limitations. For RQ1, the study did not include students who dropped out of the academy even though they started with the academy cohort. Only the students who completed the academy and obtained an associate degree were studied. For RQ2, the academies examined were only pursuing an associate degree in AGBS and students had to show interest in AGBS before the start of their high school career; therefore, the study may not apply to other associate degrees. Finally, this study was focused on rural high schools in central California, therefore, the results may not be generalized in other areas or with urban populations.

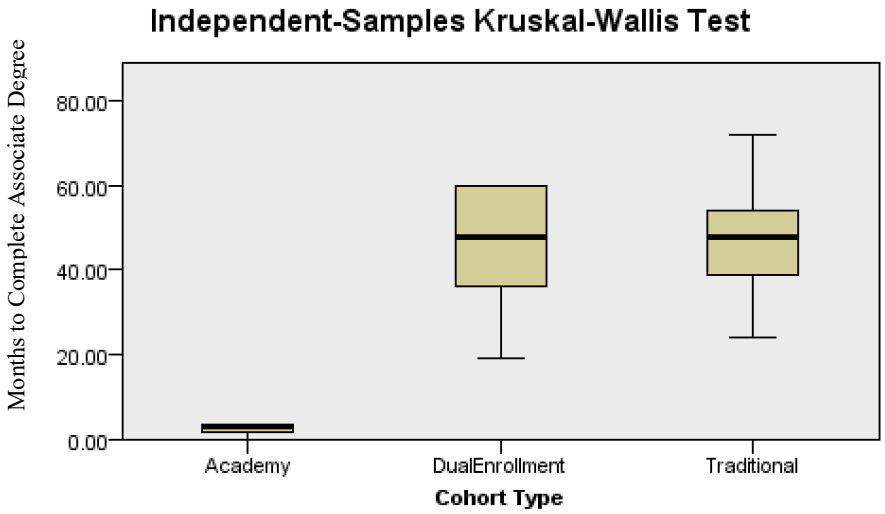
Summary

Originally, a one-way ANOVA was to be used to determine whether there were statistically significant differences in the statistical means of the ECHS Academy Program, the Dual Enrollment Program, and the Traditional Program. This test could not be used due to the violation of the assumption of normality, so the ANOVA was replaced with the KWHT. Based on the KWHT, the null hypothesis was rejected, concluding the mean ranks of the groups were not equal. To determine how the groups differed, pairwise comparisons were performed using Dunn's 1964 procedure. Results showed the mean Time to Associate Degree Completion of the ECHS Academy Program was significantly lower than both the Dual Enrollment Program and the Traditional Program (see Figure 3).

The ECHS Academy Program completed the associate degree on average in 2.23 months, while the Dual Enrollment Program took 45 months, and the Traditional Program took 46.84 months (see Figure 3). It must be noted the ECHS Academy Program provided a structured format for students to take CCCC college courses while still attending high school. Many of the ECHS Academy students completed the associate degree at the same time they graduated from high school.

Figure 3

Box Plot for the Kruskal-Wallis H Test



While it is not a surprise the ECHS Academy group completed the associate degree on average much earlier than the other programs, the study only focused on students who completed the degree. To maintain the independence of observation, students who dropped out or left the ECHS Academy were not included in the research as they could not be considered students in the Dual Enrollment Program for the function of this study. Future studies could explore all students who started the ECHS Academy and

determine the Time to Associate Degree Completion to investigate the overall success of that program and investigate why some students were able to complete an ECHS Academy and others were not.

In RQ2, based on the Chi-Squared Test for Homogeneity, the null hypothesis was rejected, and a difference was found between the proportion of students successfully obtaining an associate degree at an ECHS Academy that uses an academic screening matrix compared to the Academy that did not. Of the 66 students recruited with the interest inventory at the AWOM, 74.2% received an associate degree, and 25.8% did not. Of the 62 students recruited with the interest inventory and the AM at the AWM, 48.4% obtained an associate degree and 51.6% did not (see Table 2).

Both public schools were from rural areas with similar demographics. Faculty from the CCCC taught the courses at each high school. Each school provided additional student support in student counseling, instruction, and tutoring. Both schools had additional funding sources to equip the students for the program.

According to Bloom's taxonomy framework regarding student development, these were the results the literature review was expecting. Bloom's taxonomy posited students at the age of ECHS Academy entrance may not possess the high thinking skills to prosper in a collegiate environment (Lee et al., 2017). As younger students do not display collegiate level HOTS, this suggested using an AM based on the student's junior high school academic experience was not an effective measure of determining entrance into an ECHS Academy. A more practical measure of capability may simply be to look at more intrinsic factors of success (Gore et al., 2019). Students who demonstrate an interest

in the subject matter, in this case, the agriculture business major, are more likely to have higher levels of motivation and may develop greater tenacity to persevere through the entire program (Ramey et al., 2018).

The CCCC has discussed a significant expansion of the ECHS Academy and Dual Enrollment throughout the district to serve students where college opportunity is less accessible. As this study created some insights into the time to degree completion of ECHS Academies and Dual Enrollment as well as the recruiting methods of the academies themselves, a policy paper was developed to provide recommendations on the implementation and expansion of the CCCC's ECHS Academies. In section 3, I will discuss the policy paper and provide recommendations that may increase the effective delivery of the program as well as the success rates of students themselves.

Section 3: The Project

Introduction

In this study, the problem I addressed was that although ECHS academies have been in place at the local site for 8 years, the time to associate degree completion of the Academies compared to Dual Enrollment and Traditional Programs had not been analyzed. Compounding this problem, the different screening processes used by the academies to select participants had not been evaluated for their efficacy in selecting the best candidates as determined by associate degree completion The project stemmed from the research findings showing the academies had the shortest time to degree completion, and the AM was ineffective as a recruiting screening tool. In Section 3, I provide information about the selection of a policy paper that proposes policy recommendations to the CCCC administrative team. In this section, I present an introductory description of the project and its goals, along with the rationale, the literature review, and the implementation and evaluation plan. I also describe the institutional implications as well as the societal implications. Appendix A includes the Project Study.

Project Description and Goals

Project Description

The project is a policy paper recommending the CCCC administrative team expand the ECHS Academies after improving the recruitment policies that are used. In particular, the policy paper recommends expanding ECHS Academies after improving recruitment policies by eliminating the AM as a screening tool and providing more thorough information to Academy applicants through an Applicant Information Package

and an Interest Application. I will deliver the policy paper to the CCCC administrative team using the college's dual governance system, enabling them to make data-based, informed decisions.

The purpose of the study was on time to associate degree completion for ECHS Academy graduates compared to Dual Enrollment graduates and Traditional graduates and to determine which applicant screening process leads to more students completing their associate degrees during the ECHS Academy. To that end, the policy paper leads with an executive summary consolidating the problem as well as the evidence that led to four evidence-based recommendations: eliminate the AM, create an applicant information package, modify the interest application, and expand the ECHS Academies. The policy paper continues with an in-depth introduction that clearly describes the problem as well as the gap in practice and the lack of policy that instigated the study. The policy paper then continues with a description of the study's methodology and data analysis. This analysis, coupled with a comprehensive search of evidence-based literature and best practices, guided the policy recommendations. The policy paper closes with a suggested implementation plan, conclusion, and references.

Project Goals

The policy paper has two primary goals. The project will communicate the following to the CCCC administrative team:

1. Ways to improve the time to degree completion at all the CCCC ECHS Academies.

2. Creating a smooth system for students to exit the ECHS Academy and transition into the Dual Enrollment Program and maintain their completed units.

The results of RQ1 showed that ECHS Academies significantly reduce the time to postsecondary degree completion, and I recommend expanding the ECHS Academies our college offers. Not only will this improve college-wide time to degree completion, but it will also likely improve the colleges' success rate of degree completion. Because ECHS Academies are provided at the high school sites, students who may not have experienced college will have the opportunity to complete an associate degree (Zeiser, 2017). Creating this opportunity is in line with the CCCC's Core Values and Mission (Community College of the Central Coast, 2021).

While I did not directly inquire about the success rates of the Dual Enrollment students, RQ2 showed that many students were unable to complete the ECHS Academy Program. The policy paper recommends communicating to ECHS Academy applicants through the Applicant Information Packet strategies to transition from the ECHS Academy Program to the Dual Enrollment Program, if it is discovered that the ECHS Academy does not meet their education needs. Easily transitioning students can reinforce the Dual Enrollment Program and potentially improve the time to degree completion of those students. Future research into the time to postsecondary associate degree completion may show the Dual Enrollment Program and Traditional Program to be different due to the revised transition system.

Rationale

I selected a policy paper as it provided the CCCC with evidence-informed direction on the time to degree completion of the ECHS programs as well as guiding the AWM and the AWOM to better practices in participant recruitment. Employing an evidence-based approach shows the relationship between the research and the policy (Cheeseman et al., 2019). In addition, a policy paper needs to be intentional and focus on the college's mission and overarching goals (Leonard, 2018). The data-based evidence demonstrated in this research naturally flowed into recommended changes in policy to improve the CCCC's desire to improve time to degree acquisition by expanding ECHS Academies as well as the effectiveness of the ECHS Academy's recruitment procedures.

The data and results indicated the ECHS Academies significantly reduced the postsecondary time to associate degree completion when compared to Dual Enrollment and Traditional Programs. Furthermore, the research results recognized the ineffectiveness of using an AM as a recruitment tool based on the proportion of successful students in each academy. While it was not the focus of the study, the data also demonstrated a substantial incompletion rate in the ECHS Academies. These three findings indicate a need to modify the CCCC policy, reinforcing the decision to deliver a policy paper.

The problem that instigated this study was a missing policy at the CCCC. Although ECHS Academies have been in place at the local site for 8 years, the time to associate degree completion of the Academies compared to Dual Enrollment and Traditional Programs had not been analyzed. Compounding this problem, the different

screening processes used by the academies to select participants had not been evaluated for their efficacy in selecting the best candidates as determined by associate degree completion. As the CCCC does not have a policy in place, creating a policy recommendation paper helps fill this gap.

Review of the Literature

I used Google Scholar as well as Walden's research database and digital libraries to conduct a review of literature, which was crucial in gaining an understanding of the project study as well as best practices in developing a policy recommendation paper (see Appendix A). I focused on professional, peer-reviewed literature for change at universities and higher education, policy recommendations, transitioning in ECHS, and policy used in collegiate recruitment. I used the following keywords in my search: *change, higher education, institutional change, organizational change, communication, organizational communication, institutional communication, stakeholder communication, policy, institutional policy, higher education policy, administration, higher education administration, stakeholders, higher education stakeholders, institutional stakeholders, policy recommendations for universities and colleges, policy papers, white papers, writing policy recommendations for higher education, creating institutional change on college campuses, presenting policy recommendations to college administrators,* and *presenting policy recommendations to stakeholders.* Searches were conducted using Google Scholar and through the Walden University Library, using the following databases: Academic Search Complete, Communications and Mass Media Complete, Dissertations & Theses @ Walden University, EBSCO, Education Research Starters,

Education Source, ERIC, NCES Publications, OpenDissertations, ProQuest Central, ProQuest Dissertations & Theses Global, SAGE Journals, SAGE Knowledge, Teacher Reference Center, and Thoreau Multi-Database Search. I categorized the literature following these themes: the justification of a policy recommendation paper, the usage of evidence in the development of policy, the value of stakeholder communication, and academy education contracts.

Justification of a Policy Recommendation Paper

A policy paper is an effective avenue to share data-driven results to higher education stakeholders to ensure lasting change (Parker-Young, 2017). This positive change has been demonstrated to be effective at local and national levels of education (Nehring & Szczesiul, 2015; Shannon, 2019). Properly developed policy papers that encompass the college's values tend to be motivational and encourage action on the part of the faculty and other invested stakeholders (Christensen et al., 2020). This policy paper is expected to drive an administrative policy change to positively improve the postsecondary associate degree acquisition rate for the CCCC, influencing positive change for all stakeholders, including faculty, students, local high schools, and agricultural businesses outside the college.

Policy Papers Provide Data-Driven Results

Policy papers should be based on well-researched, factual data and be communicated clearly and concisely (Helgetun & Menter, 2020; Herman, 2018). The data should make obvious the policy that requires modification or implementation (Leonard, 2018). Using the data analysis, presented from the findings of this study,

ECHS Academies proved to significantly improve the postsecondary time to associate degree acquisition. Additionally, I found that using the AM to recruit ECHS Academy students had a negative impact on successful associate degree completion rates. The data analysis communicates the needed recommendations for policy improvements (Christensen et al., 2020; Lingard, 2013; Steiner-Khamsi et al., 2020).

Policy Papers Communicate Best Practices

Policy papers provide stakeholder decision-makers with best practices that are based on research (Cheeseman et al., 2019; Crews, 2016; Kogan, 2018). Not only will the data communicate needed changes in policy but they also provide a base to compare to other studies and policies to discover commonalities and best practices (Crews, 2016; Kogan, 2018). The AUC has partnered in forming ECHS Academies in conjunction with other community colleges in the state. While the data of this study drive policy at the CCCC, it may also point to best practices that can be used in other circumstances.

Policy Papers Are Solution Focused

While the data from policy papers can make policy recommendations and point to best practices, this is not always enough to move an institution towards a solution. Providing access to raw research evidence or even slightly simplified evidence is not generally an effective way of getting it used (Gorard et al., 2020). Herman (2018) suggested that policy papers should be used to progressively lead the reader to the recommended solutions the policy would yield, highlighting significant findings based on the data. By the conclusion of the policy paper, the reader should not only clearly

understand the problem, but they should also understand how the recommendations will lead to solutions.

The Use of Evidence in Development of Policy

When using evidence-based policymaking, policy decisions are expected to follow rigorous and accurate uses of scientific evidence (Parkhurst, 2017). Davies (1999) suggested that policy decisions without evidence are like hunches without real direction. In higher education, evidence-based policymaking is considered a component of good governance next to transparency, sustainability, efficiency, integrity, and people centricity (Bojtor & Bozsó, 2020). Providing guiding reasoning for the policy direction tends to be met with less resistance and can motivate the stakeholders who will be putting the policy in place (Parkhurst, 2017).

Evidence Provides Essential Information

Evidence provides the foundational information a policy recommendation rests upon. Quality decisions are based on clear, substantive evidence and cannot be made without that crucial data (Bennett, 2019; Parkhurst, 2017). Many institutions like the police, the judiciary, and the military cannot function properly without the security evidence provided (Fleming & Rhodes, 2018). This need for substantiation led Helgetun and Menter (2020) to suggest that we are in an evidence era where a dominant thought centers on the use of evidence to justify a policy. Quality policy development simply cannot be separated from the evidence it is based upon.

Evidence Provides Quality Assurance

Policymakers should use evidence wherever possible to guide how they design and implement their policies (Bennett, 2019). In addition, data should be used as a benchmark to measure the effectiveness of the policy as it moves forward (Beerkens, 2018). The evidence in this study demonstrated how applying an AM to eighth graders negatively affected associate degree acquisition. These data provided a placemark to provide quality assurance to describe the effectiveness of the policy recommendation in the future. Not only does data-based evidence enable policy recommendations, it is also used to measure the future progress of that policy change (Hollands et al., 2019).

Evidence as a Persuader

The data provided by investigating the research questions of the study are used to develop policy recommendations. For policy recommendations to create change, they must be followed (Fisch, 2017; Herman, 2018). Evidence is needed to persuade and to create a call to action. Carrier (2017) developed six categories of persuasion criteria to be used in the creation of policy recommendation papers: compatibility, accessibility, practicality, evidence, credibility, and appeal. Parkhurst (2017) explained that clear, concise, credible evidence is necessary to convince stakeholders to support a policy change. In the absence of evidence, political or positional influence is more likely to create policy than rational, investigative data (Fleming & Rhodes, 2018; Parkhurst, 2017).

The Value of Stakeholder Communication

When creating a policy paper, it is important to understand the group of stakeholders the policy will affect (Caputo et al., 2018; Suldovsky et al., 2017). Three

stakeholder groups will be affected by this policy paper: CCCC administration, faculty, and students; AWC and AWOC administration and staff; and leaders at the AUC. Before stakeholders can be persuaded to consider a policy recommendation, it is important to understand the stakeholder groups and their goals (Bourne, 2016; Galea et al., 2015).

The goal of the CCCC is to improve the student's time to associate degree acquisition and help them prepare for the next stage in their career. The AWC's and AWOC's goal is to propel their students interested in agriculture business careers by helping them obtain associate degrees in that field. The goal of the AUC is to train and equip the next generation of leaders for high-demand careers in agriculture.

Communicating With Student Stakeholders

The stakeholder that will be most impacted by this policy paper will be the students participating in the ECHS Academies. Therefore, it is important to communicate with students in a fashion that will effectively highlight the prudent information to be received (Bourne, 2016). In addition, the messaging needs to be delivered in an engaging, impactful manner that is easily absorbed by the recipient (Butt et al., 2016; Caputo et al., 2018; Khan et al., 2017).

Applicant Information Package

Before students can begin to make an important decision, it is prudent to communicate bigger picture ideas before minute details (Howells, 2019). Students need to understand the ECHS Academy using a broader perspective before deciding on the need for specific details and a final decision. Broader concepts like the subject matter focus of the ECHS Academy and the effort required should be communicated early in the

process. Furthermore, understanding the rewards of succeeding as well as the consequences of exiting the program at the onset, will provide a holistic understanding to make their decision.

Interest Applications

Students who are interested in the subject matter tend to be more successful in the course work (Gore et al., 2019; Lynch & Lungrin, 2018). This subject matter interest can also motivate students to attend and engage more completely and can bolster commitment in times of adversity (Farruggia et al., 2018; Xue Bai et al., 2018). As student interest is directly related to student success, it is important to properly evaluate the students' interest in the subject matter and desire to participate in the ECHS Academy.

Providing students with thought-provoking questions or discussion prompts can provide avenues to determine their ECHS Academy interest. Many college applications include essay prompts allowing students to describe their *Demonstrated Interest* in attending the university to make their enrollment decisions (Moon, 2019). Other colleges evaluate an *Interest Scale* to align student interests with a proposed major to ensure student interests are aligned with their studies (Calacal & Fabella, 2018; Haq et al., 2021). Regardless of the methodology used, linking interested students to the ECHS Academy will improve the success rate and diminish the CCCC's time to degree completion.

Academy Education Contracts

Contracts have been used to establish a framework of how individuals should operate within a given context (Loeser, 2018). They are used to establish the boundaries

of how individuals work together and support each other (Sajadi et al., 2017). As students consider participating in an ECHS Academy Program, it should be clear what is expected of them. In addition, the support a student can rely on should be understood and agreed upon by all the stakeholders (van der Walt, 2019). Outlining this information in the form of a contract communicates the obligation of all stakeholders to do their part (Essuman, 2019) to increase the likelihood of the student completing the program and receiving an associate degree as quickly as possible.

Project Description

Policy Recommendation Paper

The CCCC's Student Progression and Completion Strategic Direction states the college has "a commitment to eliminate barriers that cause students difficulties in completing their educational goals" (CCCC, 2021). One area the college has attempted to meet this strategic direction is by improving the time to degree completion. The policy paper aims to provide support for achieving this strategic direction through the following recommendations.

Recommendation #1: Eliminate the Academic Matrix

Utilizing the AM as a screening tool in addition to the interest application did not improve the time to associate degree completion for the AWM. The data showed only 48.4% of the students recruited using the AM completed the associate degree compared to the 74.2% completion rate using only the interest application. As younger students have not completely developed the cognitive ability to consistently demonstrate the

HOTS the AM was designed to measure (Anderson et al., 2001; Cherry, 2020; Dai & Scherf, 2019; Smith & Darvas, 2017), it should be eliminated.

Recommendation #2: Create an Applicant Information Package

Deciding to participate in a college-based, 4-year-long ECHS Academy is one that should be made with the best information at hand. Students need to understand the ECHS Academy Program is built upon the agriculture industry and therefore the associate degree earned in specialized. Students need to understand they are starting their collegiate career earlier than most and a greater level of effort may be required to meet the rigor of the ECHS Academy. Before students begin the ECHS Academy, they need to understand what exit strategies are available if they decide the program is not meeting their interests, as well as what happens to the units they have accrued. Finally, students need to understand the valuable resources that will be invested in them throughout the ECHS Academy. This information should be clearly communicated in an Applicant Information Package to assist in their decision process.

Recommendation #3: Modify the Interest Application

It has been shown students who are interested in the subject matter are more likely to be successful in that area (Gore et al., 2019). In addition, they are more likely to attend regularly and persevere through adversity (Bowman & Felix, 2017; Kassarnig et al., 2017). This drive demonstrates the importance of thoroughly examining a student's interest in the subject matter as well as their interest in developing academic commitment. Finally, it is recommended an ECHS Academy Education Contract be included in the Interest Application to clarify the expectations of the CCCC, the ECHS

Academy personnel, the parents, and students to improve the likelihood of program and associate degree completion.

Recommendation #4: Expand the ECHS Academies

Implementing recommendations #1, #2, and #3 will improve successful completion rates of the ECHS Academies and the CCCC's overall time to associate degree completion. Therefore, it is recommended to expand the ECHS Academies after the other recommendations are put into place. This expansion not only addressed the gaps that led to the study but also supported the college's mission and strategic direction (CCCC, 2021).

Needed Resources and Existing Support

CCCC has most, if not all, of the needed resources in place to implement the policy recommendations. No additional staff will be needed to put action to the policy recommendations as all CCCC, AWM, AWOM have program managers and their teams in place. The Records Office, Counseling Center, and Tutoring Center are fully staffed and can support the policies. The CCCC has the necessary technology and systems in place to target the policy recommendations including a graphics and printing house to professionally develop materials.

Potential Barriers and Barrier Solutions

Positive change does not occur without the growing pangs that come along with it. Some stakeholders may believe the status quo is *good enough* and many individuals are fine with changes if it does not involve themselves (Fang, 2016). The policy recommendation may meet resistance from the AWM who may believe their AM is

helping their recruitment efforts when the data tells a different story. The CCCC has been consistently progressive in modifying policies designed to improve student success. Some stakeholders may lose enthusiasm for the newest policy change if they are not provided enough time to understand the need.

While these barriers may seem like obstacles, they should be considered opportunities to engage stakeholders at a higher level and get them involved in the process. As the Applicant Information Package and the Interest Application have been recommended to be modified, it creates a chance to get other stakeholders involved in creating the vision for the final product (Garcés-Ayerbe et al., 2019). Instead of dictating the task to our partners, asking questions to receive feedback improves stakeholder engagement and the final project is more likely to be embraced by more people (Bourne, 2016; Butt et al., 2016). If the stakeholders find a need to modify the policy recommendations, this is not necessarily resistance to the policy change. Understanding the stakeholders' need to contribute should be recognized as an opportunity to improve buy-in and give community members ownership in the change process.

Implementation and Timetable

The CCCC has a dual governance system where faculty standing committees in conjunction with the Academic Senate present, discuss, and recommend the adoption policy proposals to the College Council, a group of college administrators, program managers, and elected faculty. I would introduce the policy recommendations to the ECHS Committee which is led by the ECHS program manager. The committee would discuss the proposal and make necessary modifications. If the recommendations are

accepted, the program manager will present the findings to the College Council for final deliberation and the decision for action. This process can take up to two months to complete, depending on the agendas of the various groups and committees.

After approval, the ECHS Program manager will work directly with the AWM ECHS Academy to remove the AM from the candidate screening process. The ECHS Program manager will also work with stakeholders to make the suggested changes to the Applicant Information Package and the Interest Application. As with all committee work, developing consensus and moving a project forward can take time. Once complete, this packet could then be used to recruit the next academy cohorts for fall enrollment in the upcoming year.

Roles and Responsibilities

Putting together a policy to improve the time to associate degree completion is a group effort. As the degrees are provided through the CCCC, the college has a large role to play. But there are other stakeholders. The AWM and AWOM teams have a vested interest in providing and maintaining a program that provides success for their students. The AUC, as an agriculture industry leader has an interest in developing future employees for high-demand careers.

The entire group of stakeholders needs to work collaboratively to develop the Applicant Information Package and the Interest Application. The CCCC agriculture faculty, working with the AUC will highlight the agriculture industry and encourage candidates to communicate their interest in AGBS. The AWM and AWOM Program Managers will work alongside the CCCC's Counseling and Tutoring Centers to

communicate the expected rigor of the academy as well as the work ethic expected of the candidates. CCCC's ECHS program manager will work in conjunction with the academy managers and the CCCC Records Office to communicate an exit strategy for students who discover the ECHS Academy Program is not to their liking. Finally, the ECHS Program manager will work with the CCCC Financial Aid Office to connect the financial advantages of ECHS Academy participation for the candidates. The ECHS program manager will also be responsible to work with the academies on future recruitment efforts. They will provide the ECHS Academy leaders with the updated Applicant Information Package and the Interest Application and work with AWM to discontinue the use of the AM.

Project Evaluation Plan

The policy recommendation's primary goal is the improve the overall student time to completion of associate degrees. Utilizing the data from the study, it was determined ECHS Academies significantly reduce the time to associate degree obtainment. Additionally, student interest in the academies was determined to be a dominant factor in successful ECHS Academy completion rates. The policy recommended focusing on recruiting students interested in participating in the academies using an Applicant Information Package and an Interest Application. The project evaluation will be recognized as successful with the adoption of the Applicant Information Package and the Interest Application.

After the new ninth-grade cohorts are recruited utilizing the Applicant Information Package and Interest Application it will be 4 years before the final results of

the policy recommendations can be evaluated. However, after the initial cohort completes their ECHS Academy obligations, data should be able to be evaluated every year. The completion rate of associate degree obtainment will be evaluated and compared to the rates within this study. For example, after the first year the policy had been implemented, the student credit obtainment, GPA's, drop out, and other factors can be compared to the first year of students in the study. This evaluation can continue yearly until the ECHS Academy's 4-year cycle is completed. At that point, the ECHS Academy completion rates can be analyzed and compared to the rates from this study. The outcomes-based goal is to improve the rate of associate degree completions in all academies to 75% of the starting students in comparison to the average of 61% in this study.

In addition, students who transition from the ECHS Academies to Dual Enrollment and the graduates of the program can be surveyed to better understand if the Applicant Information Package and Interest Applications need to be modified based on their experiences in the ECHS Academy Program. Surveying students leaving the ECHS Academies could inform the CCCC about the effectiveness of the Applicant Information Package and the Interest Application before a full 4-year cycle had been completed. The key stakeholders that will be evaluating the results of the policy change will be CCCC's ECHS program manager with the assistance of the program managers of the individual academies. The results will be communicated to the CCCC College Council yearly.

Project Implications

Implications and the Local Level

The CCCC is committed to creating avenues for positive social change in our communities. The policy paper is one more method to accomplish this. Several stakeholders are expected to benefit from this policy. First and foremost, the academy students are beneficiaries. These individuals are allowed to complete an associate degree in AGBS at no cost before finishing high school.

This skill-based degree is focused on providing qualified, potential employees for high-demand careers in agriculture. In addition, students may decide to continue their education and transfer to a bachelor's degree program. Upon completion, they can enter other career opportunities in agriculture business commanding even higher wages.

The agriculture industry will also benefit from the introduction of a new source of quality employees. In the local area in 2020, there was a 3.7% increase from 2015 in jobs opportunities in the AGBS area (U.S. Census Bureau, 2021a, 2021b). Across the state of California, the increase was 9.5% over the same period. Positions had been going unfilled and the local agricultural industry was struggling in providing the food and fiber for the rest of the nation.

Implications in the Larger Context

The area that the CCCC serves has one of the highest poverty rates in the nation. There are 19% of the population who lives in poverty, compared to 11.4% in the United States (U.S. Census Bureau, 2021b). Only 74.1% of the adult population has a high

school diploma compared to 88% for the United States. And dismally only 16.4% of the adult population has a bachelor's degree or higher compared to 32.1% for the country.

Students who have participated in ECHS programs have been found to have higher college participation rates and postsecondary degree obtainment (What Works Clearinghouse, 2017). Individuals with postsecondary education have greater lifetime earning power compared to those with high school degrees (U.S. Bureau of Labor Statistics, 2020). In California, ECHS programs are delivered to high school students at no cost, minimizing the student's need to go into debt to pay for their education (Baker & Doyle, 2017).

The societal benefit of a better-educated population is significant. There is a relationship between higher education and higher earnings for all ethnic groups as well as for men and women (Ma et al., 2019). In addition, higher levels of education correspond to lower levels of unemployment, poverty, dependence on social safety net programs, and incarceration rates. Finally, a higher level of education is linked to higher levels of civic participation, including voting (Ma et al., 2019). Not only does society benefit directly from an educated populace through higher tax revenues at all levels of government, but indirectly in the costs that are less incurred by the educated.

Summary

In section 3, I provided a detailed outline of the project study. A policy paper is the most appropriate deliverable for the project. The literature provided support for the policy paper and offered insight into working with multiple stakeholder groups. The CCCC has the resources in place to provide action to the individual recommendations.

While there may be pushback from some stakeholder groups, this should be recognized as an opportunity to gain buy-in and engage all stakeholders at a higher level.

In Section 4, I discuss the experience of the project study and explain the knowledge and skills I have gained. I will discuss the benefits the policy recommendations will offer the CCCC as we continue to improve the time to our student's postsecondary degree completion. I will explain the limitations of the study as well as suggestions to further the research. Finally, I will offer thoughts about how the described policy changes can lead to positive social change both in the local and global society.

Section 4: Reflections and Conclusions

Project Strengths and Limitations

The CCCC provided me with secondary data for students participating in ECHS Academies, Dual Enrollment, and the Traditional Programs. I used these data to study and conduct an analysis of the time to degree completion of students participating in ECHS Academies, Dual Enrollment, and Traditional Program students. The results showed that the ECHS Academies significantly improved the post-secondary time to degree completion. In addition, the results showed that the AM was ineffective as a screening tool for recruiting the best students for the academies. A policy paper was created to communicate the results of this study and to outline the best methodology for supporting the quickest postsecondary degree acquisition. The policy paper was also used to identify gaps in practice, thus providing opportunities for improving the program with the implementation of this new policy. After informing the stakeholders and receiving administrative support, the college has the resources needed to implement the policy recommendations.

Project Strengths

This policy paper and study are important to address the gap in practice for CCCC. Understanding how the ECHS Academies, Dual Enrollment, or Traditional Programs improve the college's time to post-secondary degree completion was crucial to comprehend before recommendations to shorten the time to degree completion could be provided. I was fortunate to have worked with the CCCC ECHS manager and the AWM and AWOM Academy coordinators to evaluate the screening process used in the

candidate application process. Their experience helped to determine the need for new policies in the recruitment process, which was instrumental in the development of this policy paper. This policy paper aligns with the CCCC's dual governance structure by providing recommendations within that framework to bring positive organizational change (see Leonard, 2018).

The policy recommendations were based on evidence collected in the study, research regarding best practices, and the identified gaps in practice to solve local problems. The policy recommendations were provided to the CCCC stakeholders using common language that was easily understood to make it easier for the CCCC stakeholders to take action that would be direct and without confusion (see Caputo et al., 2018; Garcés-Ayerbe et al., 2019). Because the data were collected on recent CCCC students, the results represented a current problem in need of a solution. I targeted the policy recommendations to improve the student's time to postsecondary degree acquisition as well as to improve the recruitment protocols of the ECHS Academies, thereby improving the overall time to degree completion time of ECHS Academy students.

Project Limitations

The biggest limitation of the policy paper and the preceding study is the transferability to different populations. As the study was performed in an agricultural area in central California, it may not be valid in other geographical areas. Also, the academies studied were in rural, agricultural areas. Rural schools tend to be less supported in their academic programs compared with urbanized programs (Hlinka, 2017). Thus, the study

results are not generalizable to urban settings. While other colleges have ECHS programs, the ECHS Academy is uncommon; therefore, the results of the study may not be transferable to institutions without academies.

Recommendations for Alternative Approaches

To address the time to degree completion from the various programs at CCCC, I could have evaluated the curriculum plan for the degree requirements. However, because I examined entire associate degree programs and the overall time to acquire those degrees, a curriculum plan would have been unwieldy to accomplish and out of the scope of a dissertation. Another challenge with attempting to determine a set curriculum plan is that college professors at the CCCC maintain academic freedom to deliver their course student learning objectives as they see fit, and the collegiate administration must support their academic freedom. Therefore, in the end, a curriculum plan would have merely been a recommendation as well.

Instead of a policy paper, I could have developed professional development training as the project deliverable. The CCCC consistently provides professional development to faculty and staff to improve holistic goals like time to degree acquisition. While faculty should attend professional development, the decision of which training to participate in falls to the faculty and staff to decide. Therefore, a professional development deliverable would not have been able to be consistently applied to every teacher on campus, thus minimizing the impact of the professional development and potential success from the project.

The information and data from the study could also have been delivered in an evaluation report that communicated the major outcomes of the study and attempted to address local needs. I was asked to evaluate the time to degree completion of the ECHS Academy Program and compare it to the Dual Enrollment Program and Traditional Program. In addition, I was asked to evaluate the effectiveness of the AM as a screening tool in ECHS Academy recruitment. The evaluation of the results of the study led to recommendations that were best communicated through a policy paper.

Scholarship, Project Development and Evaluation, and Leadership and Change

Scholarship

After 25 years in education, I felt that my professional growth had begun to slow and stagnate. As a new community college professor, I became aware of what I did not know about higher education. I selected Walden's online Doctor of Education in Higher Education and Adult Learning to continue my professional learning, allowing me to be a better research practitioner within my field. From my first course at Walden, I focused my papers and projects on considering how the ECHS programs were changing higher education. This experience was valuable as the interactions with my peers and my professors encouraged me to question myself as an educator, think a little differently, and grow again as a professional. More importantly, my Walden experiences have reinvigorated my commitment as a lifelong learner and have improved my skills as a researcher and a practitioner of knowledge. This change has impacted my professional life and has allowed me to, in turn, impact my students in a more significant way.

Project Development and Evaluation

Every individual brings a lifetime of knowledge and experience into their research. I understood that this perspective could cause bias, and I endeavored to stay objective and allow the study to unfold as it progressed. In examining hundreds of publications regarding ECHS programs and student success, I understood the value of utilizing the experiences of others when developing policy recommendations.

I used current, peer-reviewed literature to develop a larger understanding and to guide the project development. Based on the literature, I decided to develop a policy paper and include recommendations for change. I learned that many colleges have differing leadership systems to enact policy changes. Colleges also engage their stakeholders differently, and in some cases, colleges involve each stakeholder group uniquely compared to the others. Understanding the structure and systems employed by the CCCC became crucial so that they could be leveraged to promote positive changes.

If the CCCC accepts the policy recommendations, I would consider the project successful. Overall, the project's policy recommendation paper will be successful if it improves the completion rate of ECHS Academy participants and decreases the CCCC's time to postsecondary degree acquisition. A collaborative effort from all stakeholders will be needed for this to happen. As the ECHS Academy cycle lasts 4 years, it will take 4 years for the project recommendations to completely demonstrate their effectiveness. However, the stakeholders at the high schools as well as in the CCCC ECHS office can evaluate performance indicators, like GPA or program dropout rate, every year and

compare to past academy cohorts to have an early understanding of the success of the policy recommendations.

Leadership and Change

An individual does not need a title to be a leader and a catalyst of positive change. The individual leader needs to understand the underlying issues causing the need for change and then communicate that need in a way that motivates others (Dopson et al., 2019; Kim et al., 2021). In a higher education setting, most senior administrators provide the vision for the change but rely on individual stakeholders to make change happen (Frantz et al., 2020; Vlachopoulos, 2021). Individual stakeholders who engage and embrace the need for change become leaders themselves and become catalysts to make change a reality.

However, the change that this policy recommends requires the efforts of all stakeholders, from the president of the CCCC to the ECHS academy student, who is the ultimate beneficiary of the policy. For groups of stakeholders to be agents of change, communication through all levels of participants is paramount. Each stakeholder group must take the initiative to communicate their outlook to others so that the result enacted has been vetted from many points of view.

As a scholar-practitioner, I have learned I am simply the starting point for change. I provided evidence-based research to develop policy recommendations to improve the completion results of ECHS Academies. For the policy to move forward, I will need to partner with other stakeholders. Through this research process, I have learned to listen to

others' views, evaluate the content I am reading at a deeper level, and understand how to synthesize that information to start the process for change.

Reflection on Importance of the Work

I am thankful the CCCC provided me with the opportunity to study the time to degree completion for the ECHS Academies, Dual Enrollment, and Traditional Program students. By conducting this study, I determined that ECHS Academies graduate students who complete their associate degree in a shorter time. I also was able to determine the Academic AM used by one of the ECHS Academies was ineffective in helping to select the best students for the Academy. Knowing which type of ECHS program helps students graduate more quickly is important to know so schools can create and focus on providing academies that provide the quickest time to degree completion. This knowledge is important from a social change perspective because students will graduate more quickly, thus having the opportunity to begin their careers more quickly.

Educators have a social responsibility to positively impact their communities. Compared to the rest of the nation, the community the CCCC serves struggles with unemployment, low education rates, and high poverty rates (U.S. Census Bureau, 2021a, 2021b). Improving a community's education level has a positive effect on poverty and employment levels. Students who graduate from the ECHS Academy with an associate degree will enter the workforce more quickly and start paying taxes and contributing to their communities. An educated population often leads to greater social good through community activism and philanthropy (Ma et al., 2019).

The CCCC serves as a resource to improve the community's educational level. As ECHS programs have proven successful in creating postsecondary pathways at all socioeconomic levels (An, 2013; Garcia et al., 2018), improving the delivery of this program can have an impact on the community. In addition, the ECHS AGBS Academies have partnered with industry partners, creating an employment pathway for higher-earning jobs for graduates immediately on obtaining the associate degree. This program will not only have a long-term economic impact on the community, but it will also be a part of creating a college-going culture starting in high school.

Implications, Applications, and Directions for Future Research

Implications

The policy recommendations are intended to minimize the time it takes for a student to obtain an associate degree in AGBS by participating in an ECHS Academy. Decreasing the time to associate degree completion can allow a successful participant to complete an associate degree before graduating from high school without a financial investment. Graduates may be able to enter the workforce or continue their education without any encumbered debt. If graduates immediately enter the workforce, their associate degree may enable them to earn a higher wage compared to their high school graduating counterparts. The additional wages paired with nonexistent educational debt can give the individuals additional economic resources to impact their community at a younger age.

In addition, the policy recommendations encourage the individual ECHS Academies to select applicants based on their subject matter interest. As the ECHS

Academies are limited in the initial cohort participation of 60 students per academy, the candidates selected will be more likely to complete the associate degree in 4 years. This improved completion rate can ensure the most efficient use of the resources expended on the program, potentially allowing for expansion in the future.

Applications

The AUC partnered with additional community colleges in the state of California to develop other industry-based career academies. While the focus of the academies may not be in AGBS, there may be portions of this study that can be used by community colleges that have nonagriculture industry-based career academies. The other institutions may consider repeating the research using this study as a template to better understand how ECHS programs impact their campus's time to associate degree acquisition.

Directions for Future Research

In the study I produced data revealing the effectiveness of ECHS Academies in minimizing the time to postsecondary degree completion in agriculture. Agriculture is not the only area looking for qualified employees. There is also a shortage of medical and regulatory personnel (U.S. Census Bureau, 2021a, 2021b). The CCCC may consider reaching out to other area industries and research if this academy program may be of interest to other industries and help secure an interested workforce.

Although this study ended with the awarding of an associate degree, many academy students elect to continue their education instead of immediately entering the workforce (see Swanson, 2020). The agriculture industry needs bachelor’s degree

graduates. Future studies could investigate if those students completed a bachelor's degree in AGBS and entered the workforce as the AUC intended.

Conclusion

This project study started with the CCCC not understanding the time to degree completion of the ECHS Academy versus the Dual Enrollment and Traditional Programs. Additionally, I aimed to determine the difference between the proportion of students successfully obtaining the associate degree at an ECHS Academy that uses an academic screening matrix compared to one that does not. I used the knowledge and skills learned from Walden's doctoral program coupled with the insight and support of an amazing doctoral committee to conduct a research study and prepare a scholarly, data-driven, literature-based policy recommendation paper. The findings from the study will be shared with the CCCC administration, as well as the college's ECHS stakeholders, with the intent of reducing the college's time to associate degree acquisition through a strengthened ECHS Academy Program. Although this study completes the requirements of a Doctor of Education degree and concludes this chapter with Walden University, I leave a changed person. I now know how to conduct professional research and have a desire to apply that knowledge to have a continued positive impact on the students of the CCCC. The study and project provide an avenue for the CCCC to improve the ECHS Academies' time to degree completion and contribute to the literature available to the scholarly community.

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Appendix A: The Project

Time to Degree Completion

Prepared by Christopher McCraw, M.S, Doctoral Candidate December 2021

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Executive Summary

Introduction

The CCCC's Student Progression and Completion Strategic Directions state, the college has *a commitment to eliminate barriers that cause students difficulties in completing their educational goals*. One area the college has attempted to meet this strategic direction is by improving the time to degree completion. The CCCC has started to use Early College High School (ECHS) programs to improve the time to degree completion.

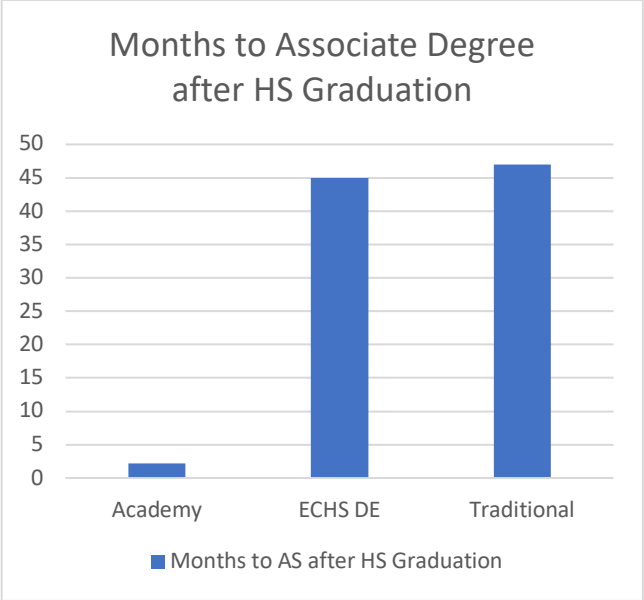
Defining the Problem

It is unknown which type of student degree pathway program has the shortest time to degree completion. The CCCC administrative team has asked for evidence-based research to be conducted to determine which program had the shortest time to degree completion. The focus of the research was to identify the difference in the mean time to obtain an associate degree for our ECHS Academy students, Dual Enrollment students, and Traditional college students.

In addition, the CCCC administrative team requested an analysis of the recruitment processes used by the ECHS Academies offering an associate degree in Agriculture Business (AGBS). In the study I also evaluated the difference between the proportion of students successfully obtaining an associate degree at the Academy Without a Matrix (AWOM) and the Academy With a Matrix (AWM). While both ECHS Academies recruited students utilizing an interest application, the AWM provided an additional layer of screening using an academic matrix (AM).

Data / Evidence

The study's findings indicate CCCC's ECHS Academies significantly diminished the mean time to associate degree completion when compared with Dual Enrollment and Traditional students. The findings found a negligible difference in the mean time to associate degree completion between CCCC's Dual Enrollment and Traditional students.



On average, it took 2.2 months after high school graduation for ECHS Academy students to complete an associate degree. The Dual Enrollment students completed an associate degree after 45 months after high school graduation and the Traditional students took nearly 47 months.

In addition, I questioned the value of utilizing an AM to recruit young ECHS Academy participants as the Academy with a Matrix (AWM) had a lower completion rate when compared to the Academy without a Matrix (AWOM). The students at the AWOM completed an associate degree at a rate 26% higher when compared to the students at the AWM.

Academy	Completion Rate
AWOM	74.2%
AWM	48.4%

Recommendations

1. Eliminate the AM from the ECHS Academy recruitment process.

2. Create an Applicant Information Package to point out some crucial components of the academy potential applicants need to be aware of.
3. Modify the Interest Application
4. Expand the ECHS Academies utilizing the Applicant Information Package and the Interest Application in the recruitment process.

Call to Action

Used in its entirety, the policy will strengthen the ECHS Academies, improve the CCCC's associate degree obtainment rate, and support students obtaining their associate degree more quickly. Since students may have their degrees more quickly, they will be provided an avenue to gain employment more quickly in critically needed areas in agriculture. This pathway to employment will demonstrate the CCCC's commitment not only to our students and community but will showcase our pledge to uphold our mission, vision, and values.

Introduction

While the CCCC has worked to improve the rate at which their students complete certificates and degrees, the time to associate degree obtainment has not significantly changed in the last 10 years (National Center for Education Statistics, 2020). Only 33% of full-time community college students were able to obtain an associate degree in 3 years (National Center for Education Statistics, 2020). If the students are part-time, the time to associate degree obtainment is increased to 6 years (Shapiro et al., 2016). Nationally, ECHS programs are being used to improve the time to degree obtainment (D'Anna et al., 2019; Grubb et al., 2017).

The CCCC has two main ECHS programs: ECHS Academies and Dual Enrollment. ECHS Academies are structured programs that allow students to complete all CCCC coursework required to complete an associate degree by the end of their senior year of study at their high school campus. Dual Enrollment allows students to take individual CCCC courses during their high school year as well, but there is not a structured or supported program. Since Dual Enrollment programs provide less support compared to the ECHS Academies, students are generally unable to complete enough coursework to obtain an associate degree while still in high school.

The CCCC started to develop partnerships with area high schools to deliver postsecondary education while the students were still in high school. In 2012, the CCCC started offering Dual Enrollment courses. In 2013, the first two ECHS Academies were formed with starting cohorts of 60 students each (Swanson, 2020). By 2020, over 11,000 students were enrolled in one of 708 ECHS programs.

The Problem

The problem that instigated my research into this policy paper was the lack of data at CCCC regarding time to degree completion for students in the ECHS Academies, the Dual Enrollment Program, and the Traditional college Program. CCCC was missing a policy that outlined the success of each program to produce students who obtain an associate degree. Also missing was an evaluation of the ECHS Academy enrollment processes to determine if the AM that is used in one ECHS Academy is more effective than ECHS Academies that did not use the AM.

Although ECHS Academies have been in place at the local site for 8 years, the time to associate degree completion of these programs versus the Dual Enrollment Programs and the Traditional Program had not been analyzed until now. Compounding this problem, the different screening processes used by the ECHS Academies to select participants had not been evaluated for their efficacy in selecting the best candidates as determined by associate degree completion. As the CCCC is looking to expand its ECHS programs, this project will result in recommendations to address the missing policy and provide data-driven information needed to effectively enhance the college's ECHS efforts.

The Purpose

The purpose of the project was to address a gap in practice by determining if ECHS Academies at the CCCC have decreased the time needed to obtain an associate degree when compared to Dual Enrollment or Traditional college enrollment and if, in the ECHS Academy applicant screening process of utilizing an AM in addition to an interest application results in higher degree obtainment rates. The project's purpose builds upon the study's findings. The policy paper provides recommendations to address problems uncovered during the study. The policy paper's recommendations include eliminating the AM used in screening recruitment for Academies, developing an Applicant Information Package for Academy recruitment, modifying the Interest Application, and expanding the ECHS Academies utilizing the new resources.

Methodology

Research Questions

The following research questions were used to guide the study:

RQ1: What is the difference in mean time to obtain an associate degree between ECHS Academy students, Dual Enrollment students, and Traditional students?

RQ2: What is the difference between the proportion of students successfully obtaining the associate degree at an ECHS academy that uses an academic screening matrix compared to one that does not?

Study Design

This quantitative study had a quasi-experimental design that examined the mean times needed for ECHS Academies, Dual Enrollment, and Traditional Programs to achieve an associate degree. A cause/effect relationship between the ECHS Academy, Dual Enrollment, and Traditional Programs and time to degree completion was derived. This understanding speaks directly to the problem statement of determining the time to degree completion and provides insight regarding the comparative effectiveness of the ECHS programs in producing students who obtain an associate degree more quickly.

Also, in the study I sought to determine how the ECHS Academy screening process, affected the success rate of the ECHS Academy Students. A chi-square test for homogeneity was applied using SPSS version 27. The two groups studied were the students who were accepted into an ECHS Academy based on an interest application and the students who were accepted into an ECHS Academy based on an interest application, attendance, GPA, math aptitude scores, and English aptitude scores. The test of two proportions was used to determine if there is a difference between the two groups on the dichotomous variable of degree obtainment.

Evidence-Informed Literature

Many students take more time to obtain postsecondary degrees than the degree warrants. The United States Department of Education evaluates college graduation success based on six- or eight-year increments (Sedmak, 2019). In 6 years, 39.3% of students can obtain an associate degree in their field of choice (Sedmak, 2019). The six-year graduation rate for bachelor students attending the same university in the United States is 62% (NCES, 2021). The CCCC would like to improve their time to associate degree obtainment rate so students can complete their education more quickly and enter the workforce sooner.

ECHS programs have been found to increase credit accumulation, improve college access and enrollment, improve degree obtainment, and even improve high school grade point average (Blankenberger et al., 2017; D'Anna et al., 2019; Morgan et al., 2018; What Works Clearinghouse, 2017). Furthermore, ECHS programs can also improve the time to associate and bachelor's degree obtainment (D'Anna et al., 2019; Garcia et al., 2018). As ECHS programs are developed, the CCCC must evaluate the methods used to recruit to ensure the criteria used is reflective of criteria that will result in more degrees being completed. Bolton and Hattie (2017) posited only students of a certain age would have the brain development to be able to participate in the higher-order thinking that postsecondary education requires. The highest levels of thinking presented through Bloom's taxonomy are normally found starting in the 11th and 12th grade of education (Anderson et al., 2001) and those students may find the greatest success in a collegiate environment (Lau et al., 2018).

However, research has also found that non-cognitive factors play an important role in student success. How students define themselves as interested students (Bowman & Felix, 2017) and as members of peer groups (Kassarnig et al., 2018) are motivational factors that improve student success. Students who are interested in the subject matter and feel like they belong, attend courses, and more consistently persist to degree completion (Gore et al., 2019; Ramey et al., 2018). Student interest was the largest contributing factor to affect college entrance for middle school students (Rudolf & Kang, 2020).

Analysis for Findings

RQ1: What is the difference in mean time to obtain an associate degree between ECHS Academy students, Dual Enrollment students, and Traditional students?

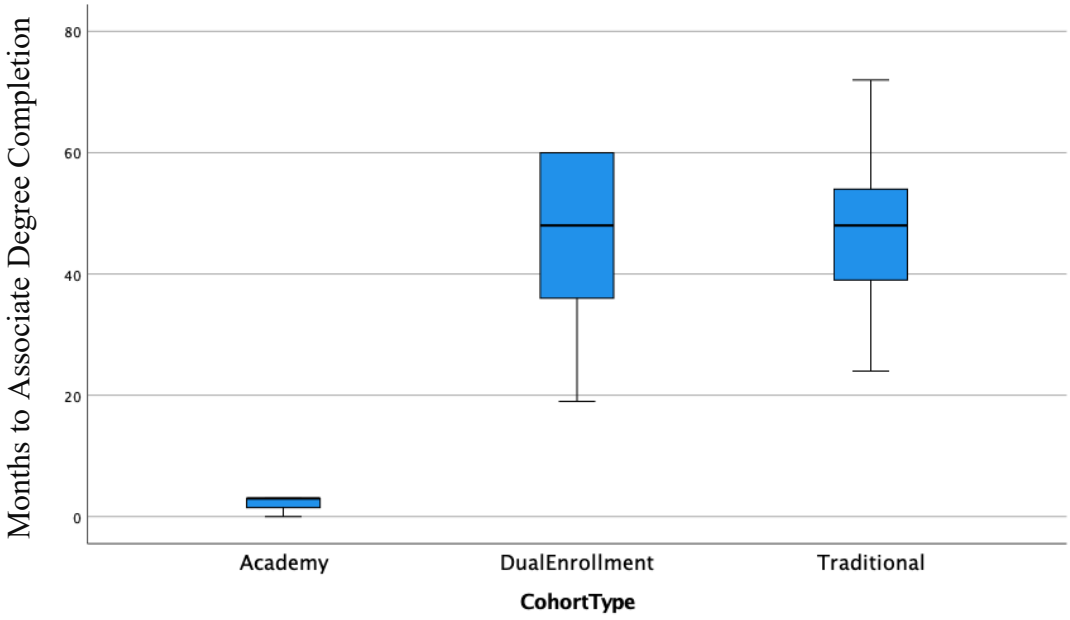
Three groups were selected from AWOM and AWM to analyze the postsecondary mean time to obtain an associate degree.

1. Students who were accepted in the AWM or AWOM ECHS Academies in September 2013 and graduated from high school in 2017.
2. Students who did not participate in an ECHS Academy but participated in Dual Enrollment, graduated from high school in 2013, and continued at the CCCC.
3. Students from the high school that did not participate in an ECHS Academy or Dual Enrollment, graduated from high school in 2013, and enrolled at the CCCC.

The Kruskal-Wallis H-Test was conducted to determine if there were differences in Time to Associate Degree Completion scores between three cohort groups of participants of ECHS Academy students, Dual Enrollment students, and Traditional students. Distributions of Time to Associate Degree Completion scores were not similar for all groups, as assessed by visual inspection of Figure 1. The distributions of Time to AS Degree Completion score were statistically significantly different between groups $\chi^2(2) = 62.797$, $\rho < .005$. Therefore, the mean ranks of the groups are not equal.

Figure 1

Boxplot of Different Programs on Time to Associate Degree Completion



To tell how the groups differed, pairwise comparisons were performed using Dunn's 1964 procedure. A Bonferroni correction for multiple comparisons was made with statistical significance accepted at the $\rho < .0166$ (a / 3) level. This post hoc analysis

revealed statistically significant differences in Time to Associate Degree Completion scores between the Academy (mean rank = 16.00) and Dual Enrollment (mean rank = 61.66) ($\rho < .005$) and Academy and Traditional (mean rank = 63.34) ($\rho < .005$) groups (see Table 1).

Table 1.

Pairwise Comparisons of Cohort Type

Sample1 – Sample 2	Test Statistic	Standard Error	Standard Test Statistic	Sig.	Adj. Sig.
ECHS Academy - Dual Enrollment	-45.661	6.779	-6.736	.000	.000
ECHS Academy – Traditional	-47.399	6.779	-6.983	.000	.000
Dual Enrollment - Traditional	-1.667	6.779	-.247	.805	1.000

Each row tests the null hypotheses that the Sample 1 and Sample 2 distributions are the same.

Asymptotic significants (2-sided tests) are displayed. The significance level is .05.

Significance values have been adjusted by the Bonferroni correction for multiple tests.

There were no significant differences between the Dual Enrollment and the Traditional Cohorts. This analysis demonstrated the Academy cohort completes an associate degree in significantly fewer months than either of the two cohorts as shown in Table 2. This data led to recommendation four.

Table 2.

Months to Associate Degree

	Cohort type	N	1	2

Tukey HSD	Academy	31	2.23	
	Dual Enrollment	31		45.00
	Traditional	31		46.84

RQ2: What is the difference between the proportion of students successfully obtaining the associate degree at an academy that uses an academic screening matrix compared to one that does not?

There are two ECHS Academies in the study. The AWOM was screened with an interest inventory while AWM was screened through the interest inventory coupled with an AM. The students at each ECHS Academy intended to obtain an associate degree within the 4 years (2017) of their high school tenure. Of the 66 students in the AWOM recruited via the interest inventory, 49 obtained an associate degree in May of 2017, and 17 did not. Of the 62 students of the AWM screened with the additional AM, 30 obtained their associate degree in May of 2019, and 32 did not (see Table 3).

Table 3.

ECHS Academy Cross Tabulation Statistics

ECHS Academy		Associate Degree		
		Not Completed	Completed	Total
AWOM	Count	17	49	66
	Percent	25.8%	74.2%	100.0%
AWM	Count	32	30	62

Percent	51.6%	48.4%	100.0%

The difference between the two proportions was calculated to assess the comparative effectiveness between the independent variables (Laerd Statistics, 2015) of the screening process used to recruit participants. The difference in proportion was .742 - .484 = .258, with $\chi^2(1) = 9.045$, $\rho = .003$, $h = .540$. Since the $\rho < .05$, the null hypothesis was rejected. Therefore, there was a difference between the proportion of students successfully obtaining an associate degree at AWM (48.4%) who uses an academic screening matrix compared to AWOM (74.2%) who does not. The AWOM without an AM had a higher percentage of students completing the associate degree compared to the AWM which used the AM. The significance difference has a medium-strength effect size. This data led to recommendations one, two, and three.

Project Recommendations

The recommendations outlined in this project policy will improve the CCCC's student mean time to associate degree acquisition. The recommendations include changing the ECHS academy in three ways:

1. Eliminate the AM from the ECHS Academy recruitment process.
2. Create an Applicant Information Package to point out some crucial components of the academy potential applicants need to be aware of.
3. Modify the Interest Application
4. Expand the ECHS Academies utilizing the Applicant Information Package and the Interest Application in the recruitment process.

Recommendation 1 – Eliminate the Academic Matrix

Multiple factors lead to a student's academic success in a collegiate atmosphere. Many students may be academically unprepared for collegiate rigor (Mokher et al., 2019). Other students have not been prepared to attend school with the tenacity required to be successful (Millea et al., 2018; Xue et al., 2018). And still, others are not motivated because they have not determined their career passions and are taking courses merely because someone told them they needed to (Rogers et al., 2018).

When the ECHS Academies were developed, it was in partnership with industry employers who wanted to encourage and inspire a future workforce. The Agriculture Unlimited Company (AUC) partnered with CCCC to create academies designed to train future generations for in-demand agriculture careers requiring an associate degree and to encourage students to continue to 4-year universities before starting their career in industry. The AUC partnered with the CCCC to develop the interest application the AWC and AWOC used to recruit Academy candidates. Students who have an interest in a subject matter tend to be more successful in those courses and have a higher degree completion rate (Caruth, 2018; Kahu & Lodge, 2018; Wong et al., 2020).

While both academies used the same interest application, the AWOC was able to graduate 74.2% of their cohort compared to 48.4% of the AWC cohort (See Table 3). The data in this research shows utilizing the AM does not help select successful students and therefore is detrimental to the completion rates of Academy students. Therefore, I recommend ending its use immediately.

When the ECHS Academies were designed, they followed the same format. The same Agriculture Business (AGBS) associate of science degree was offered at both sites.

The same CCCC professors provided instruction in the same courses. Both sites were comprehensive high schools with similar demographics (U.S. Census Bureau, 2021a, 2021b). Both ECHS Academies used the same interest of application for their recruited students.

It must be noted that both ECHS Academies used the same interest application with dramatically different results. The data shows there was a difference in the completion rates between the two ECHS Academies. AWOM had the greatest completion rates with strictly utilizing the interest application as the base of their recruitment. The only additional variable that was used by the AWM's, was the addition of the AM. Utilizing the AM is ineffective for this age group (Anderson et al., 2001; Rudolf & Kang, 2020). The academic rigor needed to prosper in a collegiate environment cannot be determined by an AM of that age group (Cherry, 2020; Dai & Scherf, 2019). Anderson et al. (2001) and Deller (2019) posit that typically high school juniors and seniors best function at the higher levels of Bloom's technology needed in college.

If an AM is unable to determine the potential success of eighth-graders entering an ECHS Academy, other screening methods need to be used. The original interest inventory used by AWOM seems to fit. Students will work harder in courses and push through adversity if they have an interest in the subject matter of the class (Farruggia et al., 2018; Kassarnig et al., 2018). Rudolf and Kang (2020) found that student interest and skills were more likely to contribute to student success when compared to academic efforts like tutoring or test scores. The first recommendation to the CCCC is to continue

utilizing the interest application in recruiting Academy students while eliminating the AM.

Recommendation 2 – Create an Applicant Information Package

Deciding to participate in a college-based, 4-year-long ECHS Academy is one that should be taken seriously by all ECHS Academy stakeholders, especially the eighth-grade students and their families. While earning an associate degree in Agriculture Business (AGBS) before graduating from high school is quite a reward, students need to understand the commitment needed to complete an associate degree. Communicating the opportunity of ECHS Academy participation and the commitment needed to be successful is the responsibility of the CCCC ECHS Academy Stakeholders.

Communicating to the student stakeholders should be in as clear and concise a manner as possible (Bourne, 2016). Communicating information to the students should be done in advance to ensure all parties have time to consider issues and get clarification if needed (van der Meer et al., 2017). I recommend the CCCC in partnership with the AWM and AWOM create an Applicant Information package highlighting the following: the agriculture industry the ECHS Academies serve, the rigor of college content and requirements, completing the academy, the financial advantages of participating in the academy, and jobs they will be eligible for upon graduation.

Needed Content - Description of the Agriculture Business Academy

Subject matter interest is a viable filtering lens to use in recruiting individuals. Students who are interested in the subject matter tend to be more successful in school (Kassarnig et al., 2018). This improved success can occur because: (a) a student's interest

engages them at a deeper level, (b) interested students have better attendance records, (c) students feel a sense of belonging to the cohort, or (d) all the above (Bowman & Felix, 2017; Gore et al., 2019; Xue Bai et al., 2018).

As the focus of the ECHS Academy recruitment becomes interest-based, it will be important to evaluate the applicant's interest in the agriculture industry. Students need to understand they will be majoring in AGBS at the CCCC and that the curriculum is agriculture-based. Communicating the value of the agriculture industry in this area as well as the potential jobs that may be available after the AGBS degree has been conferred will be important for the students to understand.

This section of the application information package can be modified to provide information about any ECHS academies that may be added in the future. I recommend recreating the applicant information package with this information to help students understand the technical program they may enter and the pathways it can lead to.

Needed Content – Academies Require Collegiate Effort

While this study showed having an interest in agriculture can propel a student through the AGBS ECHS Academies, it is crucial applicants understand the challenges ahead of them. Most thirteen-year-old brains have not matured enough to excel in the higher-level thinking processes required by collegiate rigor (Dai & Scherf, 2019; Fetterman et al., n.d.; Vijayakumar et al., 2018). Deller (2019) has suggested that juniors and seniors in high school can handle the rigor of collegiate content.

The students will complete sixty units of college courses over their 4 years of high school, starting during their ninth-grade year. While their interest has gotten them started

and can help them weather challenging content, the orientation package should straightforwardly explain the effort needed to be successful in a collegiate environment. The U.S. Department of Education suggests students plan on investing a minimum of two hours out of class for every hour in class each week (2016). For younger students, it may take longer to master the information (Dai & Scherf, 2019). In addition, Paff (2017) suggests the two hours should be focused to develop mastery of the subject matter. The stakeholders need to help students understand the rigorous challenge ahead of them. I recommend recreating the applicant information package with this information to help students understand the effort needed to be successful in CCCC's collegiate environment.

Needed Content – Completing the Agriculture ECHS Academy Program

This study showed that 25.8% of the AWOM students and 51.6% of the AWM students did not receive an associate degree in AGBS (see Table 3). It was not in the scope of this study to determine what happened to the students who were unable to complete the associate degree. It is possible the rigor of the program was more than the student was prepared for. It is also possible the students realized they did not want to pursue a degree in AGBS. It is equally possible the student moved out of the area and needed to leave the program. While the reasons are unknown, it is known that not every student graduated with an associate degree.

The ECHS Academies provide a greater level of support than Dual Enrollment or Traditional Programs to equip students for success (Lanford & Maruco, 2019). Even with that support, there is not a guarantee the students will finish the program. The stakeholders need to communicate this fact to the applicants. In addition, applicants need

to understand in advance what will become of the units they have completed if they need to transition out of the ECHS Academy. A statement like, "If you leave the Academy, you will become classified as a Dual Enrollment student and keep all the units you have earned. These units may be used in other majors and transfer to other colleges." Applicants need to understand there is a plan in place if they need to shift to other opportunities before the program can be completed. I recommend the applicant information package communicate how students can transition away from the ECHS Academy and how the units they acquired from the CCCC can be used for their benefit.

Needed Content – The Value of the Academy

While the students need to be aware of the commitment needed to be successful in the ECHS Academies, they also need to understand the rewards they will receive. ECHS Academies are offered at no cost to the applicants. If students attended traditional college or took Dual Enrollment courses, they would have to pay for the costs of college. I recommend the CCCC stakeholders communicate the value of the associate degree to the applicants, so they better understand the financial value of the academies. For example, the tuition costs for an associate degree at the CCCC is $2,760 (CCCC, 2021). If a student took the same courses in the California State University System, the cost would have been $14,355 (The California State University, 2021). If the applicant took the same courses in the University of California system, the cost would have been $35,250 (University of California Admissions, 2021). If something has perceived value, people tend to be more invested in their participation (Sethi, 2017; Sivers, 2018).

In addition, it would be valuable to point out that associate degree completers make, on average $46,124 each year totaling an additional $293,000 in lifetime earnings when compared to those who only graduate from high school (U.S. Bureau of Labor Statistics, 2020). So not only would participating in the ECHS academy save money, but it could also fast-track students to higher-paying, in-demand occupations in AGBS. Students should understand the value of their education and I recommend its inclusion in the orientation package. Including this recommendation should help the CCCC recruit students who are more aware of the value and expectations of the ECHS Academies, thus leading to a higher percentage of AGBS associate degree completers and improving the CCCC's overall time to degree completion.

Recommendation 3 – Modify the Interest Application

The Applicant Information Package should help students gain an understanding of the opportunities and challenges of ECHS Academy participation and would be the first step for applicants to assist in making a quality decision about participation. The students also need to be allowed to communicate their interest in the ECHS Academy. Of the students at the AWOM recruited only with the interest application, 74.2% graduated with an associate degree in AGBS. The data showed the interest application was an effective tool to screen students who apply to the Agriculture ECHS Academy. However, I would recommend modifying the interest application to make it even more effective.

Needed Content – Add Questions That Probe Subject Matter Interest

Students who are interested in the subject matter tend to be more invested in courses, have better attendance, and overcome adversity easier (Farruggia et al., 2018;

Gore et al., 2019). So, it becomes prudent to inquire about student interest in the agriculture industry. The following interest probing questions could be included in the application:

1. "What makes you interested in the agriculture industry?"
2. "Where does your interest in agriculture business come from?"
3. "Which area of agriculture business are you interested in working in?"
4. "When is the last time you participated in an agriculture-based activity and what made it enjoyable?"

Finding applicants who are truly interested in an agriculture business career is crucial for the success of the program; therefore, I recommend the interest application solicit that information.

Needed Content – Add Questions That Probe Academic Commitment

Although the CCCC is looking for students who are interested in the AGBS industry, we are also looking for students who understand what it takes to be successful in a collegiate environment. The application needs to seek that information. Adding a question such as, "For every three-unit course you take in the academy, you will need to invest six additional hours out of class working on the course every week. Are you able to make that time commitment?" should help students understand the effort they will need to apply. I recommend modifying the interest application to include questions to gain that information.

Needed Content – Add an Academy Education Contract to the Interest Application

Entering a CCCC ECHS Academy as a ninth-grader can be a formidable experience. While an interested student that is aware of the academic commitment needed to be successful is crucial, that does not guarantee successful completion of an associate degree by the time the ECHS Academy ends. The three additional stakeholder groups that need to be leveraged to improve the likelihood of student success are the CCCC, the ECHS Academy personnel, and the student's parents. The CCCC bears the greatest burden in providing the educational content by providing qualified instructors and ensuring the content taught meets expectations to be included in an associate degree as well as providing an exit strategy if it is determined the ECHS Academy is not an appropriate educational program for the student. The high school personnel has the responsibility to provide the infrastructure to deliver the content, work in conjunction with the CCCC to schedule the courses, and provide campus-based student support. The parents have the responsibility to encourage their children and ensure they fulfill their obligations to be successful in the ECHS Academy Program. Together, the four groups can increase the likelihood of student success.

To communicate the responsibilities of the four stakeholder groups, I recommend adding an Academy Education Contract to the interest application. Educational contracts have been valuable communication tools to communicate expectations to members of a team (Sajadi et al., 2017). When individuals understand and agree to the responsibilities they are undertaking at the beginning of a project, their likelihood of actively participating increases (Chiu et al., 2020). An Academy Education Contract will provide the student an opportunity to communicate their academic commitment to the ECHS

Academy but will also show they are being supported in the process. I recommend the creation and utilization of the Academy Education Contract.

Recommendation 4 – Expand the ECHS Academies With the New Resources

ECHS programs have been found to increase college retention rates, increase college completion rates, and decrease time to degree acquisition (D'Anna et al., 2019; Garcia et al., 2018). This success has been true in urban or rural settings and across demographics (An, 2013; Myers & Myers, 2017). In addition, high schools have found ECHS programs improve attendance, GPA, and graduation rates with the participants (Fink et al., 2017).

Currently, the CCCC has an extensive, growing ECHS program with four academies at three local high schools, Dual Enrollment Programs at an additional 28 high schools, with approximately 11,000 students being served (Swanson, 2020). This study showed the ECHS Academies significantly decreased the postsecondary time to associate degree acquisition (see Figure 1). This study also showed that students who are recruited focusing solely on interest in ECHS Academies were more likely to complete the associate degree (see Table 3). Based on this data, I would recommend continuing or expanding ECHS Academies using the Applicant Information Package and the Interest Application package from recommendations two and three.

Next Steps Following Policy Acceptance

The policy recommendations must be presented, discussed, and approved following the college's organizational guidelines. The CCCC has a dual governance system where faculty standing committees in conjunction with the Academic Senate

present, discuss, and recommend the adoption policy proposals to the College Council, a group of college administrators, program managers, and elected faculty. If board approval is needed to change policy, the college president initiates the process to have the policy come before the CCCC Board of Trustees.

The recommendations would be routed to the ECHS Committee by the Academic Senate Secretary. The ECHS committee meets bi-monthly and is led by the ECHS program manager with support from the CCCC Vice President of Outreach. The committee will place the items on the agenda for presentation and discussion. The committee will discuss the proposal and make any necessary modifications. The ECHS program manager will present initial recommendations to the College Council for support.

If recommendation one is accepted the ECHS program manager will work directly with the manager of the AWM academy to remove the AM from the screening process. If recommendation two is accepted, the ECHS program manager will need to work to make the changes to the Application Information Package. I would suggest creating a committee of stakeholders to work on this together. The AUC and CCCC agriculture faculty can draft the needed changes in the Description of the Agriculture Business Academy. Having the managers of the AWM and AWOM academies work along with CCCC's Counseling and Tutoring Centers to draft the changes in the Academies Require Collegiate Effort section would be a good partnership. The academy managers can also work with the ECHS program manager and members of the CCCC records office to draft the changes suggested in the Completing the Agriculture Academy

Program portion. Finally, the ECHS program manager could work with the CCCC Financial Aid Office to develop a draft for the Value of the Academy area. Once the drafts have been completed, the ECHS program manager can have the Applicant Information Package created and provided to the CCCC College Council for final approval before distribution.

If recommendation three is accepted the ECHS program manager will need to manage the changes needed in the Interest Application. Again, I believe a committee of stakeholders should be commissioned to make the changes. The AUC and CCCC agriculture faculty can again be used to develop the Questions that Probe Subject Matter Interest. The managers of the AWM and AWOM along with the CCCC's Counseling and Tutoring Center teams should develop the Questions that Probe Academic Commitment. Finally, the college's ECHS program manager could work with the academy managers to develop the Academy Education Contract.

Once the information is collected from recommendations, the ECHS program manager will present the findings to the College Council for the final deliberation and the decision for action. Should the recommendations be accepted, the responsibility to put them into action is given to the ECHS program manager and their team.

Conclusion

The CCCC can benefit from utilizing current research uncovered in literature and evidence collected to guide its policies and its procedures. The recommendations target improving the success rate of the students enrolled in the college's ECHS Academies, the overall associate degree obtainment rate of the college, and the preparation of graduates

that will be entering the future workforce. As these recommendations will improve the base enrollment of the college as well as an increase in associate degree obtainment rates, the increased funding received through implementation should offset any program delivery costs that occur.

When all four of the recommendations are implemented together, the college will be able to recruit the most interested and likely capable students into the ECHS Academies. The CCCC's ECHS Academies then graduate students ready to enter the workforce or continue to higher education before returning to the workforce. Developing this workforce will provide a long-term source of potential employees for employment sectors that have been missing. Over time, this employment will have a significant impact on the local populations' financial resources and assist in the CCCC's commitment to helping raise the community out of poverty once again, demonstrating our commitment to our governing Core Values.

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Appendix B: Glossary of Terms

Academic Matrix. A scoring matrix was developed using student records of attendance, grade point average (GPA), math aptitude scores, and English aptitude scores. The AM was used by the AWM to help recruit students with a greater aptitude for collegiate rigor (Kassarnig et al., 2017) to their ECHS Academy.

Academy. High school academies are small learning communities within the high school that link selected students to additional, structured resources to foster academic success (Hackmann et al., 2018; National Career Academy Coalition, 2019). The study uses the term *academy* when describing ECHS programs that are organized in an academy structure. This program was the first to be examined to determine the relationship between participation in the program and time to associate degree obtainment.

Bloom's taxonomy. A sequential system of classifying learning and cognitive abilities developed by Benjamin Bloom. He suggested that learning occurs in stages and could be ranked from the least intensive to the highest order of thinking skills and learners must develop foundational knowledge in a subject area before they can progress to high levels of understanding to demonstrate HOTS and mastery of that subject (Bloom et al., 1956).

California Career Pathways Trust (CCPT). California Assembly Bill 86, created a grant program that developed partnerships between high schools, community colleges, and business partners intending to create curricular programs to prepare students for high-

skill and high-wage careers (California Career Pathways Trust - Career Technical Education, 2019)

Collegiate Rigor. The higher-order thinking skills required to successfully complete college coursework.

Concurrent Enrollment. A program that allows students to earn college credit by taking a comparable high school affiliated course, normally taught by a high school instructor (Early College - Community College of the Central Coast, n.d.).

Dual Enrollment (DE). A program that allows students to take college courses and earn college units during the regular high school day (An, 2013). The college courses are generally taught by college professors at the high school campus (Blankenberger et al., 2017; Early College - Community College of the Central Coast, n.d.). This program has also been referred to as dual credit. Dual Enrollment was the second of the programs to be examined to determine a possible relationship between participation in the program and time to associate degree obtainment.

Early College High School (ECHS). An overarching term describing a program that offers the possibility to start a student's collegiate career and accrue college credit while still enrolled in high school allowing a student to earn a high school diploma and up to 2 years of college credit (Early College High School, 2019; Edmunds et al., 2017).

Higher Order Thinking Skills (HOTS). Complex intellectual thinking, as described by Bloom's taxonomy of analysis, synthesis, and evaluation, is needed to be successful in postsecondary education (Casagrand & Semsar, 2017; Shalaby & Milad, 2017).

Postsecondary Education. The educational level that follows the high school secondary education or a General Education Development (GED) certificate and generally results in the student earning a diploma, certification, or degree (Through Education, 2019). Postsecondary education can include colleges, vocational schools, and the military. The CCCC is a postsecondary education institution that provides certificate and associate degree programs.

Traditional Community College. This program described students who started their postsecondary education after either a high school diploma or a GED certificate had been completed (Juszkiewicz, 2020). This program was the third program to be examined to determine a possible relationship between participation in the program and time to associate degree obtainment.