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## Early College High School: A Study of Dual Enrollment Students' Academic Success Based on Classroom Environment

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EARLY COLLEGE HIGH SCHOOL: A STUDY OF DUAL  
ENROLLMENT STUDENTS' ACADEMIC SUCCESS  
BASED ON CLASSROOM ENVIRONMENT

by

Cynthia A. Johnston

A dissertation submitted to the faculty of  
Coastal Carolina University  
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

in

Education

Spadoni College of Education and Social Sciences

Coastal Carolina University

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**Coastal Carolina University Graduate School****STATEMENT OF DISSERTATION APPROVAL**

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## ABSTRACT

This ex post facto, causal-comparative, quantitative study examined variations in academic success of Early College High School (ECHS) students who completed a dual credit course in two separate classroom environments, specifically a high school classroom environment and a college classroom environment. The researcher sought to determine if a relationship existed between classroom environment and final grades of students enrolled in an ECHS. Students in the high school classroom environment sample completed a dual credit English 101 course in a high school classroom located in an ECHS, taught by a high school teacher who had been credentialed by the partnering community/technical college. Students in the college classroom environment sample completed a dual credit English 101 course in a college classroom located on a community/technical college campus, taught by a college faculty member employed by the college. Academic success was defined as the final grade earned in the dual credit course on a 4.0 grading scale represented by an A, B, C, D, or F letter grade.

The participants in the study included 420 junior and senior-level high school students who attended an ECHS located in the state of South Carolina. Archived data from 2014 to 2019 was used to review the final grades of students who completed a dual credit English 101 course offered in either the high school classroom environment or the college classroom environment. In addition to final grade data, student demographic information including age, gender, and ethnicity/race, was collected to use as control variables in the analysis.

The descriptive statistics assessment revealed that variations existed in the final course grades of ECHS students, based on the classroom environment in which they completed the dual credit English 101 course. The results indicated that the students enrolled in the high classroom environment had higher final grades than their college classroom counterparts. Specifically, the

data showed that students in the high school classroom environment sample scored an average of 1.02 points higher than students in the college campus classroom environment sample, resulting in a full letter grade differential.

The Pearson  $r$  correlation and the multiple regression analysis indicated that a strong relationship existed between final grades and classroom environment of ECHS students while controlling for age, gender, and ethnicity/race. The  $p$ -value was used as the level of statistical significance, where a  $p < .05$  was significant,  $p < .01$  was very significant, and a  $p > .05$  was non-significant (Field, 2018). The data revealed that the results were very significant at the  $p < .01$  for the relationship between final grades and classroom environment ( $p = < .001$ ), significant at the  $p < .05$  for the relationship between final grades and gender, non-significant at the  $p > .05$  for the relationship between final grades and age, and non-significant at the  $p > .05$  for the relationship between final grades and ethnicity/race.

For my aunt, the late Helaine Dorothy who made this possible.  
Thank you for inspiring me to be the strong and resilient woman I am today.

“Here’s to strong women. May we know them.  
May we be them. May we raise them.”

--Amy Rees Anderson

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## **CHAPTER ONE**

### **INTRODUCTION**

College preparation programs that bridge the gap from secondary to postsecondary education have been recognized as high-yield strategies for high school students to attain college readiness (Edwards & Hughes, 2011). One of these programs, referred to as dual enrollment, provides high school students with the opportunity to earn college credit while simultaneously completing high school graduation requirements, by taking dual credit coursework in either a high school or college classroom environment (Shivji & Wilson, 2019). As a result, students who participate in dual enrollment programs are more likely to finish high school, more prepared to enter college, and more successful after high school than peers who are not able to choose these pathways (Arnold et al., 2017; Kanny, 2015; Zinth, 2014).

Numerous studies indicate high success rates for students who enroll in dual credit courses (Bailey & Karp, 2003; Barnett et al., 2015; Edwards & Hughes, 2011; Grubb et al., 2017); however, dual enrollment options can be limited for students who are academically unprepared, educationally disadvantaged, or less likely to attend a postsecondary institution (Karp, 2015; Zinth & Barnett, 2018). When the first dual enrollment program was initiated at Syracuse University in 1973, it was created for the high-achieving, academically prepared, college-bound student (Kim, 2008). Although it was emblematic for dual enrollment programs to be limited to academically advantaged, college-bound students, advocates raised their voices to question those limits. This insurgence of public support created an awareness that dual enrollment could increase academic performance for all students, not only those exhibiting high academic ability (Howley et al., 2013).

These advocates, coupled with the growth and publicity of dual enrollment programs, paved the way for students to participate in dual enrollment who were typically underrepresented in colleges and universities. By broadening dual enrollment options to all students and offering additional support, more students could be given access to dual credit coursework regardless of their plans for postsecondary education (Zinth & Barnett, 2018). This development added a new realm to the world of dual enrollment and increased opportunities for many students.

To meet the needs of underrepresented students, the Early College High School (ECHS) was created nationwide, due in part to the Bill and Melinda Gates Foundation that provided funding for the Early College High School Initiative in 2002 (Edmunds, 2012). This model was designed to remove barriers by eliminating admissions criteria such as stringent standardized test score requirements and minimum high school grade point averages, so that dual credit opportunities could be available to students who had not previously received access. Ndiaye and Wolfe (2016) confirm, “educators who design and operate early colleges often say that the most important feature is a sincere belief by adults that every student can learn and achieve college readiness” (p. 33).

The ECHS was developed for the low-income, underserved, first-generation college student to have the ability to earn dual credit while in the comfort of a familiar high school setting. This prototype would later serve as a catalyst model to provide opportunities for many underrepresented student populations (Berger et al., 2013). During the implementation of the Early College High School Initiative in its founding year, the traditional dual credit courses taught by college faculty on college campuses were slowly joined by high school instructors teaching dual credits courses in the ECHS. The introduction of this new classroom environment for underserved students allowed high school teachers to instruct college-level courses to

students in the comfortable and familiar atmosphere of their own high schools (Berger et al., 2013).

Created through a collaboration between high schools and postsecondary institutions, the ECHS allowed underserved students to enroll in dual credit courses on both the high school campus and the partnering college's campus. This union was formed through shared leadership amongst educators, open lines of communication, alignment of resources, solid policies and procedures, community awareness, and funding (Howley et al., 2013; Karp, 2015). Although no concrete guidelines existed to ensure that a positive relationship would occur between the high school and the partnering college, it was crucial for the enterprise to grow and evolve through a continuous understanding of the benefits that these educational alliances could reap for students, as well as the institutions themselves (Stephenson, 2014).

This quantitative study sought to determine if final grades of ECHS students varied by classroom environment and if a relationship existed between classroom environment and academic success while controlling for student demographics. The study used an ex post facto, causal-comparative approach to examine the effects that variations in the classroom environment, defined as classroom location and instructor type, had on academic success, defined as students' final course grades in the dual credit course. Classroom environment, a binary variable comprised of location and instructor type, was further defined as 1) a high school classroom in which a teacher, employed by a high school and credentialed by a partnering college, was teaching a dual credit college-level course or 2) a college classroom in which a faculty member, employed by a community or technical college, was teaching a dual credit college-level course on a college campus.

The researcher selected a Pearson  $r$  correlation and a multiple regression analysis to examine the relationship between the independent variable, classroom environment, and the dependent variable, final grade earned the class, while using demographic data including age, gender, and ethnicity/race as control variables.

### **Statement of the Problem**

Although the literature indicates that students who participate in dual enrollment are more likely to graduate high school and achieve greater academic success in postsecondary institutions (Arnold et al., 2017; Berger et al., 2013; Burns et al., 2019), the opportunity to participate in dual enrollment programs is not readily available to all students (Zinth & Barnett, 2018). The ECHS model was created to provide opportunities for underserved populations to earn college credit while in high school and to change the way dual credit courses were delivered (Edmunds, 2012). By building a place for first-generation, low-income, minority students to have the same opportunities as academically advantaged college-bound students, the ECHS model paved the way for all students to experience the benefits of dual enrollment (Bernstein et al., 2014).

Historically underrepresented groups, including racial/ethnic minorities, those students in a low socioeconomic class, and first-generation college students, did not have access to earn college credit while in high school (Barnett et al., 2015). However, these groups now had the ability to earn up to 60 college credits while meeting high school graduation requirements. According to the U.S. Department of Education (2014), ECHS models provide students with the opportunity to earn an associate's degree or up to two years of a baccalaureate degree while simultaneously meeting high school requirements. In addition, these students receive additional support services, such as wrap-around support, student-faculty relationship-building, and small

learning communities that help them succeed while enrolled in the college courses (Garcia et al., 2018).

Research supports the ECHS model as a benefit to students taking dual credit courses while in high school (Nydiaye & Wolfe, 2016); however, academic success can vary depending on the classroom environment, location of the course, delivery of instruction, instructor availability, and the partnership between the high school and college (Arnold et al., 2017). This inconsistency has led to public concern about the problems that various delivery methods and classroom environments can cause for dual credit course instruction (Zinth, 2015). An abundance of research exists on traditional dual enrollment programs and ECHS models (Edmunds, 2012; Edwards & Hughes, 2011; Howley et al., 2013; Kanny, 2015; Karp, 2015; Zinth & Barnett, 2018). Yet, little research has examined the academic success of dual enrollment students based on classroom environment, specific to location and instructor type. According to Phelps and Chan (2016), “research studies are needed to explore more fully the design, delivery, and effectiveness of dual credit instruction offered in both high school and two-year college settings” (p. 78).

Limited studies have been conducted that explore the effects of classroom environment on final grades of ECHS students; therefore, this study contributed to the research by assessing whether a relationship existed between location and instructor type and final grades of ECHS students enrolled in a dual credit course. The researcher examined whether ECHS students' final grades earned in the high school classroom environment were equivalent to ECHS students' final grades earned in the college classroom environment, while controlling for demographic variables.



## Theoretical Framework

There is a limited body of literature that evaluates the effects of classroom environment on the academic success of ECHS students; however, there are several relevant theories concerning student departure and student involvement on which this study is based. Vincent Tinto's Theory of Student Departure has been used to describe how socioeconomic status, parental education level, academic ability, race, gender, and high school academic achievement influence initial commitment levels to an educational institution (Braxton et al., 2000). Variables such as these can impact academic commitment levels at educational institutions, like the ECHS, which was created for low to middle socioeconomic status, first-generation, underrepresented, and moderate academic ability students. During his time at Syracuse University, ironically the institution where the first dual enrollment program was initiated in 1973 (Kim, 2008), Tinto searched for factors that were foundational to student retention efforts and found that social and intellectual integration into the academic environment was essential to student retention (Love, 2012).

Although much of Tinto's work focuses primarily on the student departure rates of students in colleges and universities, it is important to reference his theory as a foundation for Astin's Theory of Student Involvement, due to the parallelism of their philosophies. In an interview with Alexander Astin, Astin stated, "Vince (Tinto) and I agree that his theory of college student retention, in which he developed the concepts of commitment and integration, is very similar to the notion of involvement" (Astin & Schroeder, 2003, p. 12). The theory of student involvement posits that students will have higher levels of commitment when their educational experience is meaningful and valuable, when they are self-invested, and when they are immersed in effective learning environments, both physically and psychologically

(Richmond, 1986). This concept serves as one of the theoretical frameworks for this study due to its support of the foundation for the ECHS model, which provides students with a learning environment that focuses on the importance of college readiness, persistence, relationships, family, service, and support services (Garcia et al., 2018). Looking at the classroom environment through the lens of Astin's theory, students who invest psychological and physical energy into their educational activities are more likely to succeed academically (Jaeger et al., 2013).

Limited studies have been conducted that explore the effects of classroom environment on final grades of ECHS students; therefore, this study contributed to the research by assessing the relationship that classroom location and instructor type have on final grades of ECHS students enrolled in a dual credit course. Using Astin's theory to frame the classroom environment as an atmosphere of various learning activities, teaching styles, and delivery methods (Burch et al., 2015), the academic success of ECHS students can be assessed based on the classroom location and instructor type in which the dual credit course is offered.

Self-Determination Theory (SDT) is also applicable to this study, due to its supporting literature on the effects that variations in the classroom environment, both physical and cultural, can have on students' commitment levels and final grades (Ford, 2019). Brooks and Young (2011) find that "the classroom dynamic and the relationships developed within it can also influence students' feelings of empowerment and motivation to learn" (p. 57). Through the use of SDT, social conditions created in classrooms can be examined by educators to determine how the classroom environment supports or impedes the basic psychological needs of students (Ford, 2019). These instructors can improve the learning environments for their students by providing support systems and relationship-building that can allow students to learn in a comfortable and familiar atmosphere, which can ultimately lead to academic success. This was an integral aspect

of this study that sought to determine if dual enrollment students' final grades could really be affected by the learning environment.

Providing students with a positive classroom environment is foundational to SDT and the ECHS model by setting the expectation that all students must receive support and structure to succeed. Garcia et al. (2018) confirm,

early college high schools predicated themselves on students and faculty building relationships...this allows for students and faculty to form a closeness that will allow for students to always look for assistance and support that will never let them fail because they know their relationship with their teachers will help them get through the tough courses and the difficult times. (p. 5)

Looking at classroom environment through the lens of SDT, supportive learning environments, consistent classroom policies and procedures, and relationship-building are critical to student academic success. These characteristics, typically found in the ECHS model, could influence final grades earned in a dual credit course, and specifically show that ECHS students enrolled in a college-level course taught in a high school classroom environment could achieve equivalent final grades to those students enrolled in a college-level course in a college classroom environment.

### **Purpose of the Study**

The purpose of this quantitative study was to determine if a relationship existed between variations in the classroom environment and final grades of ECHS students. Classroom environment was defined as the physical location of the classroom and the type of instructor teaching the class. The two classroom environments described in this study were 1) a high school classroom located in an ECHS, where a dual credit course was taught by a high school teacher

who had been credentialed by a partnering community or technical college, and 2) a college classroom located on a community/technical college campus, where the dual credit course was taught by a college faculty member employed by the college. Final grades were defined as the final grade in the dual credit course based on a 4.0 grading scale represented by an A, B, C, D, or F letter grade.

A Pearson  $r$  correlation and a multiple regression analysis was used to evaluate the relationship between the dual enrollment classroom environment and the final grades earned in the dual credit course. The independent variable in this study was classroom environment, which was comprised of classroom location and instructor type, and the dependent variable was the final grade earned in a dual credit course. An ex post facto, causal-comparative research approach was used to review archived institutional student data over five years from 2014 to 2019. The data included final grades of ECHS students enrolled in an English 101 dual credit course, offered in both the high school and college classroom environments. Data from 2020 and 2021 was purposefully excluded to avoid any outlier data associated with the Coronavirus Pandemic.

The participants in the study included junior and senior-level high school students attending an ECHS located in the state of South Carolina, who completed a dual credit English 101 course offered in either a high school classroom environment or a college campus classroom environment. The data collected in this study was from one specific ECHS and one specific community/technical college; therefore, the sample selected may not be representative of the entire ECHS dual enrollment population.

### **Research Questions**

The following research questions guided the study:

1. How do final course grades of ECHS students in a college-level English 101 dual credit course vary between high school and college classroom environments?
2. What is the relationship between classroom environment, comprised of classroom location and instructor type, and final course grades of ECHS students, while controlling for the effects of student demographic characteristics?

### **Definition of Terms**

For the purposes of this study, the following definitions were used:

1. Final grade was defined as the level at which a student demonstrates proficiency in a college credit course, as measured by final course letter grade A, B, C, D, or F on a 4.0 grading scale. A student is classified as proficient and academically successful if they earn a grade of B or higher (Robbins et al., 2006).
2. Classroom environment was defined as the atmosphere indicative of one specific classroom location with one specific instructor type: 1) a high school classroom located in an ECHS, where a dual credit course was taught by a high school teacher who had been credentialed by the partnering community/technical college and 2) a college classroom located on a community/technical college campus, where the dual credit course was taught by a college faculty member who was employed by the college.
3. Classroom location was defined as the physical location where the dual credit course was taught, either in a high school classroom or in a college campus classroom (Edwards et al., 2011).
4. College faculty member was defined as the instructor of a dual credit course, who was employed by the college, and taught on the college campus.

5. Credentialed high school teacher was defined as an instructor employed by a high school and credentialed by a college to teach a dual credit course in the high school. To meet the credentialing process, the high school teacher must have completed a master's degree in the content area in which they were teaching or a master's degree in another field, plus 18 graduate credit hours in the content area (Hooker, 2019).
6. Dual credit was defined as a college course that met high school graduation requirements while simultaneously earning college credit (Edwards & Hughes, 2011).
7. Dual enrollment program was defined as a program for students enrolled in a secondary institution to earn college credit while simultaneously earning high school credit required for graduation (Stephenson, 2014; Zinth, 2015).
8. ECHS was defined as a high school that partnered with a local college or university to offer students the opportunity to take courses towards earning an associate's degree or up to two years of college credit toward a baccalaureate degree while simultaneously meeting high school graduation requirements. The ECHS model was designed for underrepresented students in postsecondary institutions, including racial/ethnic minorities, low socioeconomic class, and first-generation college students (U.S. Department of Education, 2014).
9. English 101 was defined as a college-level English language, composition, and literature course that met the requirements for an English unit in high school.
10. Instructor type was based on the employer of the individual and the location in which they taught. Instructor type was defined as either a faculty member employed by a postsecondary institution, or a high school teacher employed by a school district

approved to teach dual credit courses by a partnering postsecondary institution (Horn et al., 2018).

### **Significance of the Study**

Understanding relationships between classroom environment and final grades can help explain why variances exist in dual credit course final grades of ECHS students dependent upon the environment in which the course is completed. This study may influence how school administrators and policymakers design and implement future dual credit courses, including the delivery of dual credit coursework in an ECHS setting. By examining the correlation between classroom location, instructor type, and final grades of ECHS students, the researcher sought to determine if a relationship existed between classroom environment and academic success of ECHS students.

### **Assumptions and Limitations**

It was presumed that the data collected from the Office of Institutional Research at the college in the study was accurate and compiled to separate students enrolled in a dual credit course in the high school from students enrolled in a dual credit course on the college campus. It was also presumed that the high school instructors and the college faculty members teaching the dual credit courses were appropriately credentialed.

Limitations to this study included the selection of instructors and variations in teaching style. In this study, the researcher has no control over instructor selection or teaching style. Additionally, the data collected in this study was from one specific ECHS and one specific community/technical college located in the state of South Carolina; therefore, the sample selected may not be representative of the entire ECHS dual enrollment population.

## Conclusion

This study demonstrated that an abundance of literature existed on traditional dual enrollment programs and ECHS models (Bailey & Karp, 2003), yet few research studies have examined the effect that variations in the classroom environment have on final grades. In addition, many studies stated that credentialed high school teachers were less effective than college faculty members when teaching dual credit coursework (Horn et al., 2018; Zinth, 2015). Since limited studies have been conducted to examine final grades of ECHS students based on classroom environment, including location and instructor type, this study contributed to the research by assessing the relationship between these two variables and revealing quantitative data that determined whether variations in final grades existed between classroom environments.

Academic success of ECHS students must be continually evaluated to examine the effectiveness and outcomes of ECHSs. By conducting a study to determine the relationship between classroom environment and final grades of ECHS students, the researcher was able to assess whether ECHS students enrolled in the high school classroom environment had equivalent final grades to that of their counterparts enrolled in the college classroom environment. This research could influence how school administrators and policymakers design and implement future dual credit coursework offerings.



## **CHAPTER TWO**

### **LITERATURE REVIEW**

Earning dual credit at the college level while simultaneously earning high school credit to meet graduation requirements has many positive outcomes (Regan, 2017). These students complete high school graduation requirements while earning college credit and acquiring academic skills and abilities that can be helpful after high school graduation (Horn et al., 2018). Participation in dual enrollment has been shown to benefit students in college readiness and completion (Grubb et al., 2017). Therefore, some postsecondary educators expressed concerns about the college preparation levels of high school students and advocated for the importance of high school students' readiness for college and access to college-level courses. This awareness resulted in various initiatives by some states and organizations that ultimately increased student access to dual enrollment coursework (Edmunds, 2012). Providing access to college-level coursework at the high school gives students who participate advantages over their peers who choose not to partake (Barnett et al., 2015). A study completed by the Community College Research Center in Florida showed that students who participated in dual enrollment were more likely to earn a high school diploma, enroll in college, and achieve higher grade point averages (Edwards & Hughes, 2011).

Historically, the option to take dual credit coursework was confined to a specific type of student who was considered high-achieving or college-bound, and research illustrates the benefits of dual enrollment programs for these high-ability students (Howley et al., 2013). Over time, partnerships between secondary and postsecondary institutions expanded, and even though traditional dual enrollment programs were initially created to benefit only academically

advantaged students (Bailey & Karp, 2003), academically disadvantaged students started to question their dual enrollment options. Due to the many benefits of dual enrollment programs, a surge in popularity caused many students to ask if they too could have an opportunity to enroll in college classes that could potentially earn college credit while meeting the requirements for high school graduation. However, some high schools and school districts chose to maintain their restricted access policy for dual enrollment opportunities by only allowing high-achieving students to participate (Berger et al., 2010).

This literature review examined the evolution of dual enrollment programs to include the design of the ECHS model, which was developed to remove barriers for academically disadvantaged students and provide opportunities to underserved populations (Berger et al., 2013; Berger et al., 2014). Since the insurgence of ECHSs across the country, initially in Michigan, New York, Minnesota, Texas, and North Carolina (Bernstein et al., 2014), evidence showed how the ECHS model was implemented as an initiative for the non-college-bound, first-generation college student to earn college credit, while simultaneously earning high school credit and meeting high school graduation requirements (Edmunds, 2012).

A substantial body of literature has been dedicated to the positive outcomes and college readiness levels of students who participate in dual enrollment (Wang et al., 2015). However, less attention has been given to the effects that variations in the classroom environment have on the academic success of dually enrolled students (Taylor & Yan, 2018). Variables, such as classroom location and instructor type, must be further examined to determine whether these variables have an impact on the final grades of dual enrollment students (Burch et al., 2015).

There are various instructional modality options available, and dual credit coursework can be taken on a high school campus with a credentialed high school instructor or on a college campus with a college faculty member (Adams, 2014; Horn et al., 2016). However, sometimes these varied options, derived from institutional partnerships built between the high school and the college, can cause inconsistency and confusion when environments are drastically different (Brooks & Young, 2011; Stephenson, 2014). This literature provided evidence that variations in the classroom environment, precisely classroom location and instructor type, can affect the final grades of ECHS students in a dual credit course.

### **Dual Enrollment Programs**

Dual enrollment programs were initiated through partnerships between high schools and community colleges to create opportunities for high academic, college-bound students to earn college credit, while simultaneously meeting high school graduation requirements and increasing college readiness (Karp, 2015). Over time, these programs emerged in many states, such as Michigan, New York, North Carolina, and Minnesota, to serve as early adopters of the dual credit policies that would allow high school students to enroll in college coursework (Barnett et al., 2015; Taylor et al., 2015). This partnership, supported by the local school districts and community colleges, served as an essential linkage between the secondary and postsecondary sectors to create a smooth transition for students from high school to college.

Traditionally, dual enrollment programs had eligibility requirements that limited dual enrollment access to only the high-achieving, academically advanced students who were likely to pursue postsecondary education after high school graduation (Zinth & Barnett, 2018). Most students could only participate in dual enrollment if they could meet the placement test requirements necessary for college-level work, if their high school was offering dual enrollment

opportunities, and if they could afford the tuition when the district did not support it (Barnett et al., 2015). Therefore, these opportunities were usually offered only to those students who exhibited these aforementioned characteristics, proving that underserved, minority, first-generation, low-income, and educationally disadvantaged students did not have the same dual enrollment opportunities as their more advantaged peers (Karp, 2015).

One study revealed that students whose parents had completed a higher education degree were more likely to take dual credit coursework than students whose parents had no postsecondary education. In this study, 42 percent of the students who participated in dual enrollment had parents who had earned a baccalaureate degree or higher, compared to only 26 percent of the students participating in dual enrollment whose parents never finished high school. The same study showed that Hispanic students accounted for 30 percent of students taking dual credit courses in high school, Black students accounted for 27 percent, while Asian and White students each accounted for 38 percent (U.S Department of Education, 2014).

### **Early College High School**

Dual enrollment and early college programs have been in existence since the end of the 20<sup>th</sup> century. However, changes occurred in the early 21<sup>st</sup> century that would forever change the landscape of traditional dual enrollment. For the first time, an opportunity initially reserved for students exhibiting specific academic attributes was now available to a much broader population: “in the years prior to 2000, most of these arrangements were designed to provide challenging academic content to students exhibiting high academic achievement or ability. Since the early 2000s, however, early college and dual enrollment options have been made available in many states to a wide range of students” (Howley et al., 2013, p. 80). A new model became popularized in 2002, due in part to the Bill and Melinda Gates Foundation, known as the Early

College High School Initiative (Karp, 2015). This national enterprise, funded and supported by a non-profit organization, quickly established a set of core values that would guide the way for underrepresented students (Edmunds, 2012). This initiative would mimic the core values of the Bill and Melinda Gates Foundation's Small Schools Reform Agenda, which outlined ten principles that would serve as a foundation for the ECHS model, including rigorous instruction, personalized student-instructor relationships, a focus on teaching and learning, leadership, teacher-driven professional development, assessment, community partnerships, family involvement, student development, and technology (Foley, 2010).

### **School Design**

The Early College High School Initiative would ultimately set the standard for ECHS models and serve as a catalyst for students typically underrepresented in college to have the same opportunities as their college-bound peers. By formally addressing concerns that dual enrollment programs were only available to high academic, college-bound students, more students were able to participate in dual credit courses even if they had low test scores, low high school grade point averages, or no definite plans to attend a postsecondary institution after high school (Bernstein et al., 2014).

The ECHS design provided a rigorous, yet supportive, brick-and-mortar environment where underrepresented students could thrive in a "college-for-all" atmosphere to focus on coursework that would ultimately help them achieve post-graduation aspirations (Ndiaye & Wolfe, 2016). Edmunds (2012) further defined the ECHS model as:

Early colleges are small schools that merge aspects of the high school and college experiences in order to create a new environment dedicated to increasing the number of students who graduate from high school and enroll and succeed in postsecondary

education. The target population for these schools are students for whom the entrance into college has historically been more challenging, including students who are low-income, the first in their family to go to college, or members of minority groups that are underrepresented in college. (p. 82)

Since its inception, the ECHS model has developed into a reliable pathway to higher education for underrepresented students through the collaboration of high schools and colleges to create one conglomerate institution that eliminates the educational gap between high school and college (Karp, 2015).

### **Enrollment and Instruction**

The knowledge, behaviors, and overall experience of a college environment have proven advantageous for ECHS students as they prepare for future college work (Edmunds, 2012).

According to a U.S. Department of Education impact study that examined academic achievement, grade point average, and graduation rates of dually enrolled students, ECHS students exhibited higher graduation rates, higher achievement in English/language arts, and higher rates of postsecondary enrollment compared to students taking dual credit courses in traditional high schools (U.S. Department of Education, 2014).

A study conducted by Garcia et al. (2018) analyzed students' personal and academic experiences while enrolled in an ECHS. The study gathered information from six students who discussed their personal and educational experiences in an ECHS setting. The six themes that emerged from the study were college readiness, persistence, relationships, family, service, and support services (Garcia et al., 2018). These reoccurring themes provided evidence of the support systems typically found in the ECHS model.

The three “R’s”, standing for rigor, relationships, and relevance (Shear et al., 2008), drove the ECHS model as an environment of support, respect, and responsibility (Ongaga, 2010). When investigating the impact of the ECHS model on students’ academic performance in terms of the three R’s, the data suggested that the ECHS was a high-quality learning environment that provided rigorous courses and instruction, positive relationships, extensive student support, and teachers who took responsibility for student learning (Bernstein et al., 2014). These institutions were built on family support, relationship building, and connections with peers. In a study that examined the cultural aspects of an ECHS model, Cravey (2013) found that diversity, respect, responsibility, safety, learning, and caring were the key themes that resonated from students when describing an ECHS. He also noted that students felt safer, both physically and emotionally, while enrolled in an ECHS in comparison to a traditional high school due to the comfort and security of the school atmosphere.

### **Funding and Cost**

As dual enrollment programs continued to be recognized as a benefit to high school students, policymakers and dual enrollment supporters tried to find a way to make dual enrollment affordable and accessible for all eligible high school students, especially low-income and minority populations (Adams, 2014). The costs associated with dual enrollment can be high, but the benefits outweigh the expense when compared to the price of a four-year postsecondary education (Regan, 2017). Many times, students were provided with monetary savings when the tuition was paid by the high school, school district, postsecondary school, or state appropriation (Burns & Lewis, 2000), but these funding sources can vary by state. For example, the state of Florida instituted legislation that shifted the cost burden to the K-12 districts, while Alabama lawmakers created a tax credit to fund dual enrollment, and the state of Delaware funded a

scholarship for all low-income students that were interested in taking dual enrollment coursework (Adams, 2014).

In the state of South Carolina where this study occurred, the regulations were dependent upon the county within the state. For example, in one county, all tuition costs for dual enrollment were paid by the K-12 school district, if the class was not offered at the high school as an Advanced Placement course. However, in the neighboring county, the K-12 school district did not incur any costs of the dual credit courses; therefore, the cost was absorbed by the students and families unless there was an outside funding source available.

### **Impact**

When the Bill and Melinda Gates Foundation's Early College Initiative (ECHSI) was created in 2002, it made such an impact that more than 240 ECHSs opened within 11 years of the launch (Berger et al., 2013). This initiative, dedicated to providing opportunities for underserved students to earn postsecondary credit while in high school, created a brick-and-mortar facility where students could thrive in an effective learning environment. In a study based on 10 ECHSs, strong evidence was discovered that attending an ECHS had a positive impact on students. Specifically, ECHS students were significantly more likely to graduate from high school, significantly more likely to enroll in college, and significantly more likely to earn a college degree than students not enrolled in an ECHS (Berger et al., 2013).

In a subsequent study one year later, the researchers reviewed how student demographics, including gender, first-generation, race, income, and prior achievement, impacted degree attainment for ECHS students. The study showed that degree attainment was similar for males and females, and similar for first-generation and non-first-generation students, but significantly different by race, income, and prior achievement. The impact on college degree attainment was



significantly stronger for minority students than for white students, significantly stronger for low-income students than high-income students, and significantly stronger for students who entered high school with better mathematics and ELA scores than students with lower mathematics and ELA scores. This study provided evidence that minority and low-income ECHS students are statistically more likely to obtain a college degree than comparison students who are not enrolled in an ECHS (Berger et al., 2014).

### **Classroom Environment**

The classroom environment creates a learning community rich in culture and pedagogy through engaging classroom experiences that set expectations for success (Kuh et al., 2008). Classroom environment, defined for the purposes of this study as the combination of classroom location and instructor type, was an important factor when reviewing academic success of ECHS students. When viewing classroom environment through the lens of Astin's Theory of Student Involvement, it was apparent that an effective atmosphere of learning can lead to academic success. When all variables are in synchronization, including student commitment and instructor involvement, these culminating efforts can encourage student excitement about learning (Richmond, 1986).

The addition of the ECHS model spurred an integral movement for school districts and higher education institutions to establish a new classroom environment in which dual enrollment coursework would be delivered (Ndiaye & Wolfe, 2016). This development created an environmental shift where traditional dual credit courses, once confined to the college campus, were now available in high school classrooms. Variations in the classroom environment now existed for dually enrolled students, dependent upon where the dual credit course was offered and who was teaching. However, this change sparked conflict and doubt as the quality of

instruction was questioned. Once dual credit courses were offered in multiple locations, concerns over unfair practices such as biased self-evaluations and grade inflation were raised (Burns et al., 2019). This skepticism was echoed in a study by Taylor et al. (2015) that explored the quality of instruction, the rigor of coursework, and academic preparedness levels of the students enrolled in dual credit courses when they were offered in various classroom settings. One of the most prevalent outcomes of the study included a finding that varying instructor qualifications and classroom locations created a problem when students preferred one approach over the other (Taylor et al., 2015).

The concept of dual enrollment is simple, but it is not without problems (Burns & Lewis, 2000; Hebert, 2001). As dual enrollment programs continued to grow, the need for qualified instructors also increased, and to meet the demand, adjunct faculty were hired to teach dual enrollment students on college campuses. At the same time, high school teachers were becoming credentialed by partnering colleges to teach in high school classrooms. This variation in classroom location and instructor type started to impact the academic success of dual enrollment students when the learning environments were vastly different. Students needed a sense of continuity, and when some of their courses were taught by a college faculty member on a college campus, while others were taught by a credentialed high school teacher on a high school campus, the lack of stability had an effect on grade performance (Brooks & Young, 2011).

As part of the Concurrent Courses Initiative funded in 2008 by the James Irvine Foundation, The Community College Research Center (CCRC) at the Teachers College of Columbia University administered and assessed a study based on classroom location and instructor type (Hughes & Edwards, 2012). Data was collected from a small group of instructors who were selected to participate in a research study based on the classroom environment. The

first group contained high school teachers who had recently been credentialed through a local community college to teach dual credit coursework in a high school classroom. The second group was comprised of college faculty members who taught college-aged students on a college campus.

A few challenges surfaced immediately during the study. The high school teachers found difficulty creating a college environment in their classrooms and struggled with the definition of college-level rigorous coursework. The college faculty members found difficulty teaching high school-aged students and were unfamiliar with the levels of support available to high school students. At the conclusion of the study, the instructors reflected on their experience and found that, due to the unfamiliarity of the environment in which they were teaching, they had not met the needs of their dually enrolled students (Hughes & Edwards, 2012).

### **Classroom Location**

Dependent upon the design and location of the dual enrollment program, dual credit courses can be offered on a high school campus, a college campus, or in an online environment (Adams, 2014; Brooks & Young, 2011). High school students can be mixed in classes with college students on a college campus or enrolled in their own high school with other high school students (Burns & Lewis, 2000). Studies have shown that classroom location has an impact on the student experience (D'Amico et al., 2013). However, little research exists on the academic success of ECHS students who complete dual credit courses in various classroom locations. And there are numerous questions about the level of instructional quality and the experiences of students who participate in dual enrollment in various classroom locations (An & Taylor, 2019).

Some research suggests that the college classroom is a more suitable environment for dual enrollment coursework, due to the authentic college experience and access to many of the

college's support services (Hughes & Edwards, 2012; Edwards et al., 2011). Students who participate in dual enrollment on college campuses receive more benefits from the course and have higher levels of concentration when taken on a college campus (An & Taylor, 2019). Some researchers also argue that courses offered on the college campus have a higher level of academic rigor than the same courses being taught on the high school campus (Zinth, 2015). Furthermore, another study showed that course completion rates were higher in the college classroom than in the high school classroom (Lochmiller et al., 2016). And yet another study showed that students enrolled in dual credit courses on the college campus had higher educational aspirations than their peers who were dually enrolled on the high school campus (Smith, 2007). These studies provided evidence that dual enrollment on college campuses yielded the best results because students reaped greater benefits and had more value when taking a dual credit course at the college (Burns & Lewis, 2000).

Other research, however, proposes that the high school classroom is more suited for dual enrollment because of the clear messages to students about expectations, consequences, and guidance (Karp, 2015). A study by Brooks and Young (2011) examined levels of autonomy in the college classroom and its effect on students' enthusiasm for learning. The study posited that too many choices, typically found in the college environment, could hinder the learning process for students by creating inconsistency and confusion. The study found that some students in the college classroom environment who had mandatory assignments, coupled with a very relaxed attendance policy, did not prefer the student-driven environmental experience that contained a combination of structure and leniency. Alternately, students who took coursework in a college classroom environment organized like a high school environment, where there were mandatory

assignments and a mandatory attendance policy, favored the consistency and regulation of the teacher-driven environmental experience that contained structure and rules.

One study showed that dual enrollment students often felt more comfortable with their high school instructor because of the level of support, care, validation, and concern that they provided (Kanny, 2015). Another study that compared dual credit courses completed on a college campus to dual credit courses completed on a high school campus revealed that the high school consistently predicted higher levels of student success (Phelps & Chan, 2016). In a similar study conducted by Dixon and Slate (2014), 88.71% of the students enrolled in a dual credit psychology course on the high school campuses achieved academic success, in comparison to 84.50% of students enrolled in the same dual credit course on the college campus.

A qualitative study conducted by Kanny (2015) examined the experience of five dual enrollment students based on classroom location. The participants, who had taken prior dual credit coursework in their high school, were enrolled in two dual credit courses offered in a college classroom. The dual credit courses were offered on a college campus located seven miles from the high school, and the classes were taught by college faculty members. Upon completion of the semester, the students were interviewed to describe their experience taking dual credit courses in a college classroom, compared to taking the classes in a high school classroom.

The students interviewed in the study revealed that they experienced both benefits and detriments to taking the dual credit coursework on the college campus with a college faculty member. The students appreciated the opportunity to gain early exposure to the college environment, to experience college student expectations by professors, and to have freedom from the very structured high school setting. However, their experience resonated in low grades, which reflected poorly on their high school transcript, negative interactions with college student

classmates, and limited support systems from college faculty and staff. Three of the five students who participated in the study reported earning an F letter grade in one or more courses during the college campus semester, while the other two participants reported that their lowest letter grades earned were a C and a D. Overall, the students enjoyed the experience of taking dual credit courses on a college campus; however, they were frustrated with the lack of support from college personnel and felt as though they could have achieved higher grades in their courses if additional support, similar to what is available in the high school classroom, had been provided (Kanny, 2015).

Travel logistics had an impact on classroom location preferences of students when transportation was either not available or was costly. It was convenient for students to enroll in dual credit coursework at their high school because they did not have to travel to the college campus (Hughes & Edwards, 2012). The costs associated with transportation are high and the time necessary for travel to and from the college campus deterred some high school students from participating in dual enrollment on a college campus. In fact, in some schools where the district paid for the courses, dual credit was only offered at the high school, due to the logistics, cost, and time associated with bus travel (Edwards et al., 2011).

Studies showed that classroom location had an influence on educational outcomes and academic success. However, due to the numerous studies that supported each position, it was not clear which location was more effective than the other (An & Taylor, 2019). Additionally, much of the literature base was centered on traditional dual enrollment models, rather than an ECHS model. Therefore, it is unknown whether the experiences of students reflected in the literature review were an accurate representation of the ECHS student population.

## **Instructor Type**

As more dual credit courses are taught in both high school and college classrooms, there are many people that question the steadfastness of high school instructors teaching college-level coursework. Student participation in dual enrollment coursework is on the rise, as is the level of objectivity by college administrators looking at dual enrollment instruction through a narrow lens (Hughes & Edwards, 2012). The rigor and consistency of college courses taught to high school students have become a matter of public interest, and judgment has been placed on the credibility of high school teachers and their ability to teach college-level courses (Zinth, 2015). The popularity of dual enrollment and the attractiveness of these programs have gained the attention of cynics and naysayers, who criticize the inconsistency of the curricula and teaching requirements. And research shows that the steady growth of dual enrollment course offerings has raised concern about the quality of instruction and the qualifications of those teaching the courses, with specific criticism of high school teachers who have been credentialed by a community or technical college (Horn et al., 2018).

Even though many higher education institutions accept dual enrollment coursework for transfer credit, some institutions still have concerns about the quality of course instruction and the rigor of the dual enrollment courses when the courses are taught by credentialed high school teachers (Martinez, 2018). Some colleges and universities refuse to accept dual enrollment credit if the course is taught by a high school teacher. An administrator from one private four-year institution felt so strongly that college-level courses should only be offered on a college campus and taught by a college professor, that he refused to recognize dual credit coursework as college-level if the class was not offered on a college campus (Reisberg, 1998). A prominent university

in Louisiana took the same stance by refusing to award university credit for dual enrollment courses if they were taught by a high school teacher in a high school setting (Hebert, 2001).

To avoid scrutiny, most credentialing institutions require that the high school instructors teaching dual enrollment courses off campus maintain the same standards as college professors teaching the same class on campus (Hughes & Edwards, 2012). However, there is reluctance by some four-year colleges and universities to award any credit for dual credit coursework when the course is taught by a credentialed high school teacher, due to the credentialing process itself. State and regional accrediting agencies, such as the Higher Learning Commission and the Southern Association of Colleges and Schools Commission on Colleges, set forth policies for instructor qualifications (D'Amico et al., 2013), and the standard requirement for a high school teacher to be credentialed as a dual enrollment, college-level instructor, is a master's degree in the content area or a master's degree in another field, plus 18 graduate credits in the relevant content area (Hooker, 2019; Horn et al., 2016). But, unfortunately, hiring for these high school instruction positions is sometimes made without requiring standard credentials or, in some states, without any credentials at all. For example, according to a statewide survey in Minnesota, only a quarter of the dual enrollment instructors in the state had met the master's degree, plus 18 in the content area requirement (Hooker, 2019).

A study by the Education Commission of the States' Dual/Concurrent Enrollment, reviewed qualification levels of high school instructors teaching dual credit coursework across 50 states (Zinth, 2014). The study concluded that 12 states had no policy for state-level instructor qualifications of dual enrollment programs, 10 states followed accreditor-approved qualifications, 35 states required high school instructors to have equivalent qualifications as college faculty, 9 states required instructors to have a master's degree in any field, and 7 states



required the master's degree, plus 18 credits. The state of South Carolina, where this study occurred, required that high school instructors teaching dual enrollment coursework have qualifications comparable to those of the faculty teaching the same courses on the college campus (Zinth, 2014). Most postsecondary institutions in South Carolina follow the guidelines set forth by the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) which require instructor approval by the Chief Academic Officer of the partnering college (Horn et al., 2016).

There are many studies that discredit credentialed high school instructors who teach dual credit coursework (Herbert, 2001; Horn et al., 2016). However, due to logistical impediments, there are instances when a credentialed high school instructor must teach a dual credit course at the secondary institution as the only option. According to data from the National Center on Education Statistics, public high school students enrolled in dual credit coursework are 10 percent more likely to take the courses in a high school classroom versus a college classroom (Zinth, 2015). A variety of reasons exist for this inflation, including region and transportation. Rural areas have higher rates of dual enrollment students on high school campuses due to proximity, lack of transportation, and cost, which can limit a student's ability to participate in dual enrollment programs (Zinth, 2015). Therefore, some institutions must credential high school instructors for the purposes of dual enrollment if they want their students to have this opportunity.

Many community colleges have difficulty finding enough qualified adjunct faculty to teach dual credit coursework at the college; therefore, they look to high school teachers to obtain the credentials necessary to teach as adjunct professors in the high schools. Some college faculty experience difficulty teaching dually enrolled students because it is outside their comfort level,

while others do not want to teach dual enrollment students at all. Even though the job of an educator entails more than just pedagogy, some college faculty must be enticed with a reduced teaching load to take on additional responsibilities (Astin, 2017). And some college faculty want to focus solely on students who are academically prepared while avoiding those considered average or underprepared, even though students taking dual credit coursework in an ECHS setting could be considered average or underprepared (Astin, 2017; Regan, 2017). For this reason, college instructors teaching high school students for the first time often need help in understanding and connecting with their students. When these problems surface, it is usually recommended that the faculty partake in professional development prior to teaching dual credit coursework (Edwards et al., 2011).

Although the literature is abundant on the skepticism of credentialed high school instruction (Hughes & Edwards, 2012; Martinez, 2018; Reisberg, 1998; Zinth, 2015), a study conducted by Hebert (2001) explored the final grades of dual enrollment students based on instructor type, and found evidence that students excelled when taught by a credentialed high school instructor. This study compared the final grades of two student groups taking the same dual enrollment math class. One group received instruction from a credentialed high school teacher, and one group received instruction from a college faculty member. The study, which was conducted over the course of five years, was located in a high school classroom with two different instructor types. One group of 920 students was taught by a credentialed high school teacher, while the other group with 913 students was taught by a college faculty member. The independent variable in the study was the type of instructor, and the dependent variable was the learning outcome or final grades. Upon completion of the study, it was determined that the group of students taught by the credentialed high school teacher had significantly more A and B letter

grades than expected. Conversely, the group of students taught by the college faculty member had significantly more D and F letter grades than expected. Thus, this study provided evidence that instructor type had a quantifiable effect on the final grades of dual enrollment students (Hebert, 2001).

In a study by Hall (2013) that analyzed ECHS students' perceptions of their high school instructors and their college instructors, a statistically significant finding showed that the ECHS students responded more positively to the high school instructors than the college instructors. In fact, 54.9 % of the ECHS students believed that their high school teachers truly cared about them while only 27% of ECHS students believed this about their college instructors. Additionally, 43.4% of the ECHS student felt listened to and 42.5% felt encouraged by their high school instructors while only 30.1% of the ECHS students felt listened to and 18.8% felt encouraged by their college instructors. Lastly, 43% of ECHS students felt respected and appreciated by their high school instructor and 56.4% indicated that their high school instructors worked hard to assure that they were learning, while only 25.7% of the ECHS students felt respected and appreciated by their college instructor and only 35.9% of the ECHS students indicated that their college instructors worked hard to assure that they were learning (Hall, 2013).

In the aforementioned study, it was apparent that instructor type had an influence on educational outcomes and academic success. However, due to the numerous studies that supported each position, it is still not clear which instructor type was more effective. In addition, much of the literature base was centered on traditional dual enrollment models rather than the ECHS model. Therefore, it is unknown whether the research presented in the literature review was an accurate representation of the ECHS student population.

## Conclusion

The literature presented in this chapter explored many facets of dual enrollment programs, with an emphasis on the ECHS model, and provided a theoretical framework for the study through Tinto's Theory of Student Departure, Astin's Theory of Student Involvement, and Self-Determination Theory. In a review of the research and literature, there were numerous benefits for students who took advantage of dual enrollment opportunities (Grubb et al., 2017). Dual enrollment programs are beneficial to high school students to earn college credit, while simultaneously meeting high school requirements, and studies confirmed that dual enrollment has a positive effect on students' final grades (Karp, 2015). In addition, traditional dual credit options have been proven successful for academically advanced, college-bound students (Kim, 2008).

Legislation stemming from the No Child Left Behind Act urged schools to increase the number of students taking dual enrollment courses due to the many benefits (Arnold et al., 2017), and because of this, dual enrollment became increasingly available to a broader range of students, with respect to ethnicity/race, socioeconomic status, and academic achievement (Kanny, 2015). In the last decade, there has been a national movement to increase college readiness and encourage college attainment for the first-generation, academically underprepared, non-college-bound students (Edwards & Hughes, 2011). ECHS models encapsulated this change by providing a successful option for students who were the first in their family to enroll in college or are part of an underrepresented minority population (Garcia et al., 2018).

Studies show that offering rigorous coursework in the secondary institution and developing college-ready academic behaviors and skills help students become better prepared for postsecondary education (Edmunds, 2012). However, there are questions about the level of rigor

that need to be further examined. Therefore, a thorough review of variations in classroom environment was completed to identify the effects that classroom location and instructor type had on the final grades of ECHS students enrolled in dual credit courses.

As supported by the literature, the researcher sought to determine whether ECHS students taking a dual credit course in a high school classroom environment demonstrated at the same level as ECHS students taking a dual credit course in a college classroom environment, as measured by final grades in a dual credit course. An ex post facto, casual-comparative approach was used in this quantitative study to determine if a relationship existed between classroom environment, including classroom location and instructor type, and final grades of dually enrolled ECHS student, while controlling for student demographics.

## **CHAPTER THREE**

### **METHODOLOGY**

This quantitative study sought to understand how final grades varied for ECHS students who took dual credit courses in a high school classroom environment versus a college classroom environment. The study used an ex post facto, causal-comparative approach to examine the final grades of students enrolled in an ECHS who completed dual credit coursework in two classroom environments, specifically a high school classroom with a credentialed high school teacher and a college classroom with a college faculty member. This study sought to determine whether final course grades of ECHS students varied by classroom environment, specific to location and instructor type, and if there was a relationship between classroom environment and the final grades of dual enrollment students while controlling for age, gender, and ethnicity/race. High school instructors who teach dual credit courses have been scrutinized for their credibility and ability to teach college-level courses (Hughes & Edwards, 2012). Therefore, this study examined the achievement levels of ECHS students, as determined by final grades, to determine if the students in the high school classroom environment with the high school teacher exhibited equal levels of academic success as the ECHS students in the college classroom environment with the college faculty member.

#### **Research Questions**

The following research questions guided the study:

1. How do final course grades of ECHS students in a college-level English course vary between high school and college classroom environments?

2. What is the relationship between classroom environment, comprised of classroom location and instructor type, and final grades of ECHS students, while controlling for the effects of student demographic characteristics?

### **Research Design**

This study used a quantitative, ex post facto, causal-comparative research design to examine institutional data from 2014 to 2019. The data included final grades earned by ECHS students enrolled in a dual credit English 101 course offered in either a high school environment or a college environment. The independent variable in this study was classroom environment, which included classroom location and instructor type. The dependent variable was the final grade earned in the dual credit course. Student demographic information including age, gender, and ethnicity/race were used as control variables.

Demographic data was used to determine the distribution of the sample based on age, gender, and ethnicity/race. Descriptive statistics were used to describe the frequency, range, mean, and standard deviation of the final course grade data based on classroom environment. A Pearson  $r$  correlation analysis was conducted to determine the strength of the relationship between variables. The Pearson  $r$  correlation was selected to measure the correlation coefficient due to its ability to analyze the relationship between two or more continuous variables and the degree to which the quantitative variables were related.

A multiple regression analysis was used to examine the relationship between final course grades in the dual credit course, and classroom environment, while controlling for the effects of student demographic characteristics. This statistical analysis was chosen due to its effectiveness in evaluating the influence of multiple predictor variables on one continuous variable (Hinkle et al., 2003) and its ability to control for other factors that could simultaneously affect the

dependent variable. Since student demographic characteristics were used as control variables, a multiple regression model was used in place of a simple regression model due to the fact that it could accommodate multiple explanatory variables.

A causal-comparative study is defined as a research design that seeks to find naturally occurring associations between independent and dependent variables (Salkind, 2010). This study intended to determine whether a relationship occurred between an independent variable and a dependent variable by comparing the final grades of ECHS students from two different classroom environments. An ex post facto study is a research design in which the study begins after the event has occurred, with no interference from the researcher (Salkind, 2010). By using archived data, the researcher avoided any manipulation of the independent or dependent variables, since the examination did not occur until after the final grades had been recorded.

### **Research Site and Participants**

ECHSs are designed for students to earn up to two years of college credit, while simultaneously meeting requirements to earn a high school diploma. These institutions offer personalized learning environments that blend high school and college into a coherent educational program. Known for removing barriers to postsecondary education and providing students with academic preparation to meet college readiness standards, ECHSs provide students with extra support and resources in the form of counseling, academic coaching, and mentoring.

The vision of an ECHS is to provide a personalized education that maximizes student potential and encourages students to become socially responsible, productive citizens. The mission is to provide a small, personalized learning community that accelerates the diverse student population to become responsible citizens who are strong critical thinkers, collaborators, and communicators. As set forth by the Early College High School Initiative in 2002, the core



values of the ECHS model have been to serve students underrepresented in higher education, to partner with higher education institutions, to provide students with the opportunity to earn transferable college credit that leads to college completion, and to engage with students through a comprehensive support system to develop academic and social skills (Berger et al., 2010). Typically, students enroll in high school courses in their freshman and sophomore years and dual credit college-level courses in their junior and senior-level years. Dual credit courses offered in the high school are taught by a credentialed high school teacher, and on the partnering community/technical college campus, they are taught by a college faculty member. Students may take dual credit coursework in either the high school classroom environment or the college classroom environment while enrolled in an ECHS.

The ECHS selected for this study exemplifies the core values of the Early College High School Initiative by providing a rigorous curriculum with high expectations for self and students; guiding students to communicate with clarity and precision; developing students who use their minds well in every aspect of their lives; and creating a culture where students are excited about learning and preparing students to be productive citizens who serve their communities. This ECHS maintains an annual enrollment of 400 students and is comprised of grades nine through twelve. The high school has been in existence for 15 years and serves students from one of the largest counties in the state of South Carolina. The students enrolled are considered underrepresented in postsecondary education, including students of color, students from low-income families, and the first generation in their family to attend college. These students are highly capable, middle-achieving students who generally have scores in the middle quartiles on standardized tests such as the PACT/PASS, MAP, and EXPLORE exams.

The community/technical college partner of the ECHS selected for this study is one of 16 technical colleges in the South Carolina Technical College System. The college has been in existence for over 50 years and serves students from one of the largest counties in the state of South Carolina. This technical college maintains an enrollment of 8,000 students and is one of the largest technical colleges in the state, with dual enrollment students accounting for almost 20% of the total enrollment number. Dual enrollment students can be enrolled in dual credit courses on the college campus, in their high school, online, or in the ECHS, which is located on the college's campus.

The participants in the study included 420 junior and senior level students who attended an ECHS located in the state of South Carolina from 2014 to 2019. Only students who completed a dual credit English 101 course offered in either a high school classroom environment or a college campus classroom environment during the academic years 2014 to 2019 were included in the study. English 101 was selected for the study because it was one of the few dual credit courses that could be taken in either classroom environment.

Academic success was defined as the final letter grade earned in the English 101 dual credit course on a 4.0 grading scale represented by an A, B, C, D, or F letter grade. All students who earned a letter grade of A, B, C, D, or F were included in the study. Two final grades of WF (withdraw failing) were coded as F letter grades, while twelve W (withdraw) letter grades and one I (incomplete) letter grade were excluded from the original data set ( $N = 433$ ). Seven students took the English 101 class more than one time, and each grade was included in the data set.

This study further examined academic success relative to student demographic characteristics, including age, gender, and ethnicity/race. Gender was coded as either male or

female, and there were no students who did not select one of the two gender types. Age was determined as the age of the student on the first day of the semester in which the student was enrolled; January 1 was used for spring semesters and August 1 was used for fall semesters. Ethnicity/Race was coded as Black, Hispanic, White, or Unknown; Unknown was inclusive of 25 responses where more than one ethnicity/race was selected.

The first sample contained 347 ECHS students who completed an English 101 dual credit course in an ECHS classroom. The course was taught by a high school teacher, who was employed by the school district and credentialed by the community/technical college. The teacher credentialing process followed the guidelines set forth by the SACSCOC the partnering community/technical college, and the state to require a master's degree in the content area in which the instructor is teaching or a master's degree in another field, plus 18 additional graduate credits in the content area. The second sample contained 73 ECHS students who completed an English 101 dual credit course in a community/technical college classroom, located on a community/technical college campus. The course was taught by a college faculty member employed by the community/technical college.

### **Instrumentation**

Archived data was used to conduct a Pearson  $r$  correlation and a multiple regression analysis that examined the relationship between classroom location, instructor type, and final grades earned in an English 101 dual credit course. The Pearson  $r$  correlation was selected to measure the strength of the relationship between variables by analyzing the degree to which the quantitative variables were related and the direction of the relationship. The multiple regression analysis assessed whether a relationship existed between classroom environment and final grades of ECHS students by reviewing the relationship between the independent variable, classroom

environment, comprised of classroom location and instructor type, and the dependent variable, final grade earned in the dual credit course. Student demographical information, including age, gender, and ethnicity/race, were used as control variables.

Gender was coded as a binary variable of either male or female; there were no students who did not select one of the two gender types. Age was determined as the age of the student on the first day of the semester in which the student was enrolled; January 1 was used for spring semesters, and August 1 was used for fall semesters. Ethnicity/race was coded using nominal variables representing Black, Hispanic, White, or Unknown. Unknown was inclusive of responses where no ethnicity/race was selected or more than one ethnicity/race was selected.

The independent variable in the study was classroom environment, which was a binary variable comprised of classroom location and instructor type, and the dependent variable in the study was academic success, as measured by final grades. The control variables were age, gender, and ethnicity/race. The dependent variable contained ordinal data that was converted to numerical data where A = 4, B = 3, C = 2, D = 1, and F = 0. This conversion was used to measure the academic success score for each student based on a 5-point scale, where a score of 4 was the highest possible score, meaning that the student earned an A as the final letter grade in the dual credit class, and a score of 0 indicated the lowest possible score, meaning that the student earned an F as the final letter grade in the dual credit class.

### **Data Collection**

The community/technical college maintained the dual credit coursework final grade data in the college's Student Information System, Banner, which was used for the quantitative data analysis. The Office of Institutional Research at the college provided the cross-sectional data containing final course grades in the dual credit course, English 101, for fall and spring

semesters from 2014 to 2019 for the total data set ( $N = 420$ ). Data from years 2020 and 2021 were purposefully excluded to avoid any outlier data associated with the Coronavirus Pandemic. Permission was obtained from the college to use the data for the purposes of this study, and permission was granted from the Institutional Review Board at Coastal Carolina University to commence with data collection. To maintain confidentiality, personal identifiers were removed once the data was sorted.

### **Data Analysis**

The data was coded and analyzed using the IBM Statistical Package for Social Sciences Version 28 (SPSS). Descriptive statistics were used to describe the frequencies, ranges, means, and standard deviations for each variable. The cross-sectional data were examined to review the final grades earned in an English 101 dual credit course to determine whether variations in classroom environment influenced final course grades of ECHS students and specifically, if a relationship existed between classroom location, instructor type, and final course grades of ECHS students. The researcher sought to determine whether ECHS students who completed English 101 in the high school classroom environment had equivalent final grades to those students who completed the English 101 course in the college classroom environment. The data analysis was completed over two months, while collecting and analyzing the archived data from the participating ECHS and community/technical college. Upon completion of the data analysis, the researcher created a histogram to look for a normal bell-shaped curve distribution of scores. The data was presented in tables and figures, and the results were interpreted through statistical significance testing to determine if a statistically significant finding occurred.

A Pearson  $r$  correlation analysis was conducted to determine the strength of the relationship between variables. The Pearson  $r$  correlation was selected to measure the correlation

coefficient due to its ability to analyze the relationship between two or more continuous variables. The degree to which the quantitative variables were related and the direction of the relationship was noted by a correlation coefficient between .00 and  $\pm 1.00$ . A correlation of +1.00 or -1.00 indicated a perfect relationship, while a correlation of 0 indicated no relationship (Gall et al., 2007).

A multiple regression statistical test was used to discover whether the independent variable, classroom environment, predicted students' academic success in the course as measured by the dependent variable, final grade earned in the English 101 dual credit course, while controlling for demographics including age, gender, and ethnicity/race. The  $p$ -value was calculated to determine whether the data were statistically significant. A multiple linear regression formula was used to examine whether a relationship existed between the independent variable and the dependent variable, while controlling for student demographics.

The multiple regression formula used for this study was:

$$y = \beta_0 + \beta_1(ENV) + \beta_2(AGE) + \beta_3(GEN) + \beta_4(ETH) + \varepsilon_i$$

where  $y$  was the predicted value of students' academic success, measured by the final grade earned on the dual credit English 101 class.  $\beta_0$  served as the constant; this is the prediction for the final grade when all of the variables were fixed at zero.  $\beta_i$  are the regression coefficients for the effect of the independent variable, classroom environment (ENV), which was a binary variable including classroom location and instructor type, and control variables age (AGE), gender (GEN), and ethnicity/race (ETH). The regression coefficients indicate how much the final grade changes as a result of an incremental unit change in the independent or control variables while holding all other variables constant. As a categorical variable, the effect of ethnicity/race is

measured compared to the reference category (White), since it was the largest demographic in the sample.  $\epsilon_i$  was used as the random error term.

### **Limitations**

One limitation of the study was the geographical location. The study was limited to junior and senior-level dually enrolled students that completed English 101 from one specific ECHS and one specific community/technical college located in the state of South Carolina from years 2014 to 2019. The small geographic area and number of students in this study made it difficult to provide generalizations and may not be representative of the entire ECHS dual enrollment population, due to the modest size of the data set. A second limitation to this study included the lack of selection process for the instructors and inconsistencies in instruction. Variations in teaching style, years of experience, and inconsistent instruction could have affected the outcome of the study. The third limitation was a lack of qualitative data. Additional survey data could have provided instructor and student perspectives of the two environments to help determine the reasons why students had higher levels of academic success in the high school classroom environment versus the college classroom environment. The last limitation was the lack of literature on this specific topic. An absence of literature made it difficult to compare this study to the results of others.

### **Conclusion**

This chapter provided a thorough explanation of the research design and methodology that was used in this study. A causal-comparative ex post facto, quantitative approach was used to evaluate the relationship between final grades of ECHS and classroom environments. By conducting a study to determine the relationship between classroom environment and final

grades of ECHS students, the researcher sought to assess whether ECHS students enrolled in the high school classroom environment had equivalent final grades to that of their counterparts enrolled in the college classroom environment. Chapter Four presents the results of the descriptive statistics, the Pearson  $r$  correlation, and the multiple regression analysis, which could influence how school administrators and policymakers design and implement future dual credit coursework offerings.



## CHAPTER FOUR

### RESULTS

The purpose of this ex post facto study was to compare ECHS students' academic success in an English 101 dual credit course relative to their classroom environment, specifically the physical location of the classroom and the type of instructor teaching the course. The two classroom environments examined in this study were 1) a high school classroom located in an ECHS, where the dual credit course was taught by a high school teacher who had been credentialed by the partnering community/technical college, and 2) a college classroom located on a community/technical college campus, where the dual credit course was taught by a college faculty member employed by the college.

The following research questions guided the study:

1. How do final course grades of ECHS students in a college-level English 101 dual credit course vary between high school and college classroom environments?
2. What is the relationship between classroom environment, comprised of classroom location and instructor type, and final course grades of ECHS students, while controlling for the effects of student demographic characteristics?

#### **Demographic Data**

Data from ECHS junior and senior level students who had completed an English 101 dual credit course with a letter grade of A, B, C, D or F in either the fall or spring semesters from 2014 to 2019 were used in this study. The total sample size was comprised of 420 students, which was then divided into two smaller samples. The first sample, also referred to as the high

school classroom environment group, contained 347 ECHS students who completed an English 101 dual credit course in an ECHS classroom, taught by a high school teacher who was employed by the school district, and credentialed by the community/technical college. The second sample, also referred to as the college classroom environment group, contained 73 ECHS students who completed an English 101 dual credit course in a community/technical college classroom which was located on a community/technical college campus, and taught by a college faculty member who was employed by the community/technical college. Descriptive statistics were used to analyze the data. Frequencies and percentages were calculated using SPSS for the total sample in regard to age, gender, and ethnicity/race.

Table 4.1 represents the frequencies and percentages of students' age in the total sample and broken down into the two classroom environment groups. Data from a total of 420 students was used for the data analysis. The demographic data revealed that the majority of students in the total sample were 16 years of age 58.9% ( $n = 247$ ) and 17 years of age 34% ( $n = 143$ ). Students aged 15 and 18 accounted for the lowest percentage, 5.7% ( $n = 24$ ) and 1.4% ( $n = 6$ ), respectively. There were 347 students who completed English 101 in the high school classroom environment. The demographic data revealed that the majority of students were 16 years of age 58.8% ( $n = 204$ ) and 17 years of age 35.1% ( $n = 122$ ). Students aged 15 and 18 accounted for the lowest percentage, 4.9% ( $n = 17$ ) and 1.2% ( $n = 4$ ) respectively. Seventy-three students completed English 101 in the college classroom environment. The demographic data revealed that the majority of students were 16 years of age 58.9% ( $n = 43$ ) and 17 years of age 28.8% ( $n = 21$ ). Students aged 15 and 18 accounted for the lowest percentage, 9.6% ( $n = 7$ ) and 2.7% ( $n = 2$ ), respectively.

**Table 4.1***Age Frequency and Percentage by Environment*

	All Students ( <i>N</i> = 420)		High School Classroom Students ( <i>n</i> = 347)		College Classroom Students ( <i>n</i> = 73)	
	<i>N</i>	%	<i>n</i>	%	<i>n</i>	%
Age						
15	24	5.7%	17	4.9%	7	9.6%
16	247	58.9%	204	58.8%	43	58.9%
17	143	34.0%	122	35.1%	21	28.8%
18	6	1.4%	4	1.2%	2	2.7%

Table 4.2 represents the frequencies and percentages of students' gender and ethnicity/race of the entire sample. Data from a total of 420 ECHS students were used for the data analysis. The demographic data revealed that the entire data set was comprised of 66.7% female (*n* = 280) and 33.3% male (*n* = 140). They were 23.3% Black (*n* = 98), 11.7% Hispanic (*n* = 49), 16.2% Unknown (*n* = 68), and 48.8% White (*n* = 205). Female students outnumbered male students averaging a 2:1 female to male ratio in the total sample, as well as the subsamples.

Data from 347 students was used for the high school classroom environment data analysis. The demographic data revealed that the high school classroom environment was comprised of 68.9% female (*n* = 239) and 31.1% male (*n* = 108). They were 23.9% Black (*n* = 83), 11.5% Hispanic (*n* = 40), 15.9% Unknown (*n* = 55), and 48.7% White (*n* = 169). Data from 73 students was used for the college classroom environment data analysis. The demographic data revealed that the college classroom environment was comprised of 56.2% female (*n* = 41) and 43.8% male (*n* = 32). They were 20.6% Black (*n* = 15), 12.3% Hispanic (*n* = 9), 17.8% Unknown (*n* = 13), and 49.3% White (*n* = 36).

**Table 4.2***Gender and Ethnicity/Race Frequency and Percentage by Environment*

	All Students ( <i>N</i> = 420)		High School Classroom Students ( <i>n</i> = 347)		College Classroom Students ( <i>n</i> = 73)	
	<i>N</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Gender</b>						
Female	280	66.7%	239	68.9%	41	56.2%
Male	140	33.3%	108	31.1%	32	43.8%
<b>Race/Ethnicity</b>						
Black	98	23.3%	83	23.9%	15	20.6%
Hispanic	49	11.7%	40	11.5%	9	12.3%
Unknown	68	16.2%	55	15.9%	13	17.8%
White	205	48.8%	169	48.7%	36	49.3%

*Note.* Unknown = students whose ethnicity/race was unknown and students who identified with more than one ethnicity/race.

### **Data Analysis by Research Question**

The data analysis was completed over two months, while collecting and analyzing the archived data from the participating ECHS and community/technical college. The cross-sectional data were examined using SPSS to review the final grades earned in an English 101 dual credit course to determine whether a relationship existed between classroom environment and final course grades of ECHS students. Descriptive statistics, a Pearson *r* correlation, and a multiple regression analysis were used to analyze the data. The results were then interpreted through statistical significance testing to determine if a statistically significant finding occurred. The study was guided by two research questions.

## Research Question One

The first research question investigated how final course grades of ECHS students in a college-level English 101 dual credit course varied between high school and college classroom environments. Descriptive statistics were calculated using SPSS to determine the measure of central tendency and standard deviation of students' final grades in both samples. The mean was used to find the center of the frequency distribution by calculating the average or midpoint of the data set for both samples (Field, 2018). To measure the dispersion of data around the mean, the standard deviation was calculated to find the extent to which the distribution of scores deviated from the mean (Gall et al., 2007). The following tables represent the means and standard deviations in the frequency distributions.

Table 4.3 represents the means and standard deviations of students' final grades in the total sample. The dependent variable contained ordinal data that was converted to numerical data where A = 4, B = 3, C = 2, D = 1, and F = 0. This conversion was used to measure academic success for each student based on a 5-point scale, where a score of 4 was the highest possible score meaning that the student earned an A as the final letter grade in the dual credit class, and a score of 0 indicated the lowest possible score, meaning that the student earned an F letter grade as the final grade in the dual credit class. The data revealed a final grade score range, mean, and standard deviation (*range* = 0 – 4, *M* = 2.42, *SD* = 1.24) for all students in the data set (*N* = 420), a final grade score range, mean, and standard deviation (*range* = 0 – 4, *M* = 2.60, *SD* = 1.17) for students in the high school classroom environment sample (*n* = 347), and a final grade score range, mean, and standard deviation (*range* = 0 – 4, *M* = 1.58, *SD* = 1.25) for students in the college classroom environment sample (*n* = 73).

**Table 4.3***Final Grade Mean and Standard Deviation by Environment*

	All Students ( $N = 420$ )	High School Classroom Students ( $n = 347$ )	College Classroom Students ( $n = 73$ )
Final Grade			
Mean	2.42	2.60	1.58
Standard Deviation	1.24	1.17	1.25

The mean final grade score for the 347 students in the high school classroom environment group ( $M = 2.60$ ) was higher than the mean final grade score for the 73 students in the college classroom environment group ( $M = 1.58$ ), concluding that the average final grade score was higher in the high school classroom environment sample. The standard deviation for the 347 students in the high school classroom environment group ( $SD = 1.17$ ) was slightly lower than the standard deviation for the 73 students in the college classroom environment group ( $SD = 1.25$ ), concluding that the scores were clustered slightly closer to the mean in the high school classroom environment sample. Overall, the data showed that students in the high school classroom environment sample scored an average of 1.02 points higher than students in the college campus classroom environment sample, resulting in a full letter grade differential.

Figure 4.1 shows a histogram of the distribution of final grade scores for all students. The figure indicates that a majority of the final grade scores were at the 3.00 or 2.00 levels, revealing a higher number of B or C letter grades than A, D, or F letter grades for students in the total data set ( $N = 420$ ). It should be noted that the number of students in the high school classroom environment sample ( $n = 347$ ) outnumbered the number of students in the college classroom

environment ( $n = 73$ ) by a ratio of approximately 5:1 which represented a mean score of the entire sample that was more similar to that of the high school classroom sample and less similar to that of the college classroom score.

### Figure 4.1

*Distribution of Final Grades for All Students*

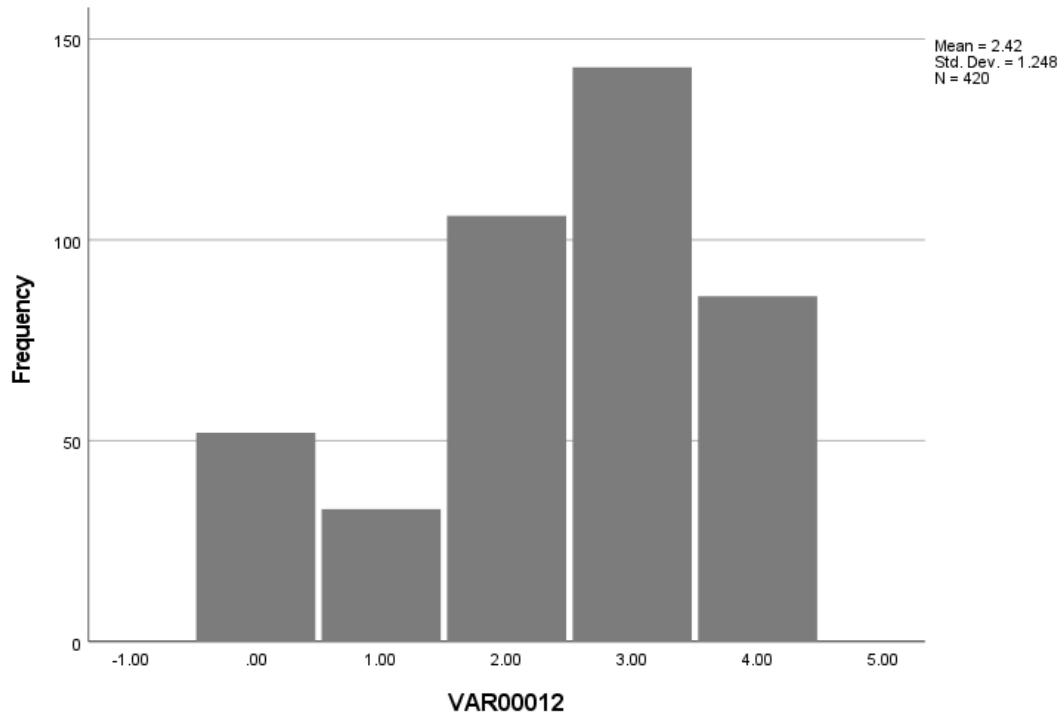


Figure 4.2 shows a histogram of the distribution of final grade scores for high school classroom environment students. The figure indicates that a majority of the final grade scores were at the 3.00 or 2.00 levels, revealing a higher number of B or C letter grades than A, D, or F letter grades for students in the high school environment sample ( $n = 347$ ), which was very similar to the total data set ( $N = 420$ ).

**Figure 4.2**

*Final Grade Distribution for High School Environment Students*

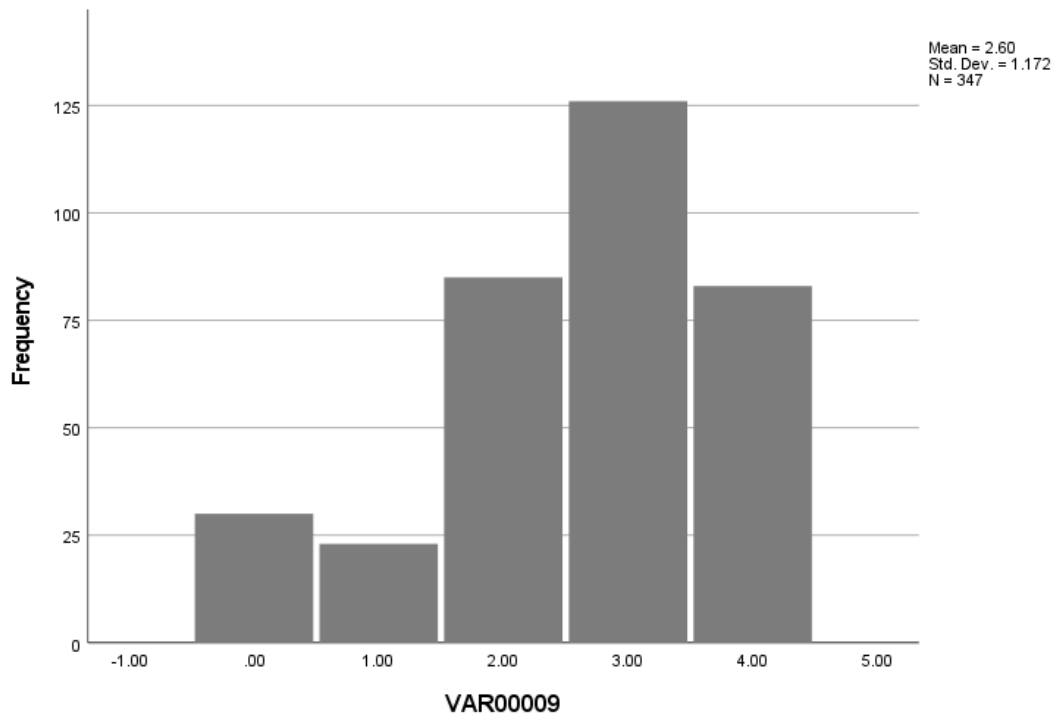
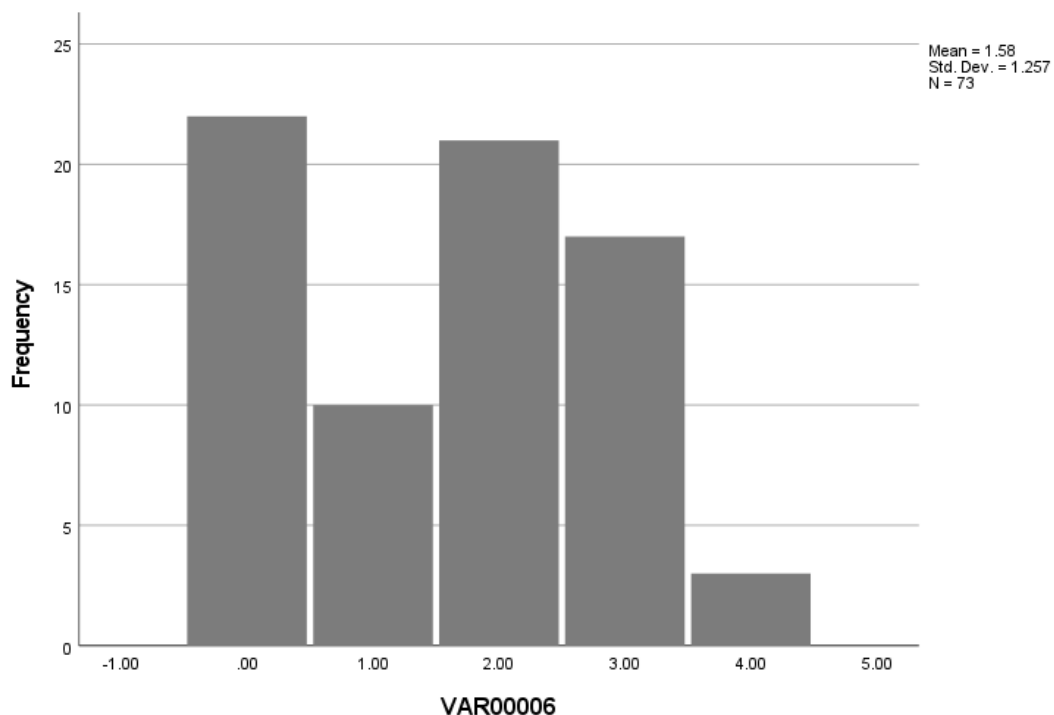


Figure 4.3 shows a histogram of the distribution of final grade scores for college classroom environment students. The figure indicates that a majority of the final grade scores were at the 2.00 or 0.00 levels, revealing more C or F letter grades than A, B, or D letter grades for students in the college environment sample ( $n = 73$ ), which was very dissimilar to the total data set ( $N = 420$ ).



**Figure 4.3***Final Grade Distribution for College Environment Students***Research Question Two**

The second research question investigated the relationship between classroom environment and final course grades of ECHS students, while controlling for the effects of student demographic characteristics. Both a Pearson  $r$  correlation analysis and a multiple regression analysis were utilized to analyze the data. A Pearson  $r$  correlation analysis was conducted to determine the strength of the relationship between variables and was selected to measure the correlation coefficient due to its ability to analyze the relationship between two or more continuous variables. The degree to which the quantitative variables were related and the direction of the relationship was noted by a correlation coefficient between .00 and  $\pm 1.00$  where a correlation of +1.00 or -1.00 indicated a perfect relationship, while a correlation of 0 indicated no relationship (Gall et al., 2007).

Table 4.4 represents a Pearson  $r$  correlation analysis that measured the relationship between final grades and classroom environment while controlling for age, gender, and ethnicity/race in the total data set ( $N = 420$ ). The Pearson  $r$  correlation analysis determined that the strongest relationship was indicated between final grades and classroom environment, as shown by a positive Pearson  $r$  correlation ( $r = .312$ ), and the second strongest relationship was indicated between final grades and gender as shown by a negative Pearson  $r$  correlation ( $r = -.143$ ). The analysis showed little to no relationship between final grades and age as shown by a negative Pearson  $r$  correlation ( $r = -.024$ ) and little to no relationship between final grades and ethnicity/race Black ( $r = -.043$ ), Hispanic ( $r = .025$ ), Unknown ( $r = -.035$ ), and White ( $r = .046$ ).

The  $p$ -value was used as the level of statistical significance, where a  $p < .05$  was significant,  $p < .01$  was very significant, and a  $p > .05$  was non-significant (Field, 2018). The data revealed that the results were very significant at the  $p < .01$  for the relationship between final grades and classroom environment ( $p = <.001$ ), significant at the  $p < .01$  for the relationship between final grades and gender ( $p = .002$ ), and non-significant at the  $p > .05$  for the relationship between final grades and age, and non-significant at the  $p > .05$  for the relationship between final grades and ethnicity/race.

**Table 4.4***Correlation Analysis for All Students*

Model	Variable	Final Grade	Gender	Environment	Age	White	Black	Hispanic	Unknown
Pearson Correlation	Final Grades	1.000	.143	.312	-.024	.046	-.043	.025	-.035
	Gender <sup>b</sup>	-.143**	1.000	-.102	.011	.007	-.032	-.037	.059
	Environment	.312***	-.102	1.000	.050	-.005	.030	-.009	-.020
	Age	-.024	.011	.050	1.000	.000	.023	-.028	-.002
	White	.046	.007	-.005	.000	1.000	-.539	-.355	-.429
	Black	-.043	-.032	.030	.023	-.539	1.000	-.200	-.242
	Hispanic	.025	-.037	-.009	-.028	-.355	-.200	1.000	-.160
	Unknown <sup>a</sup>	-.035	.059	-.020	-.002	-.429	-.242	-.160	1.000
Sig. (1-tailed)	Final Grades	.	.002	< .001	.312	.172	.189	.303	.235
	Gender	.002	.	.018	.409	.445	.258	.227	.112
	Environment	.000	.018	.	.153	.462	.269	.423	.340
	Age	.312	.409	.153	.	.496	.320	.281	.482
	White	.172	.445	.462	.496	.	.000	.000	.000
	Black	.189	.258	.269	.320	.000	.	.000	.000
	Hispanic	.303	.227	.423	.281	.000	.000	.	.001
	Unknown	.235	.112	.340	.482	.000	.000	.001	.

*Note.*  $N = 420$ . The relationship between classroom environment and final grades was examined.

<sup>a</sup>Unknown = students whose ethnicity/race was unknown and students who identified with more than one ethnicity/race. <sup>b</sup>Female = 0, Male = 1. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

Table 4.5 represents the results of the multiple regression analysis that predicted final grades based on classroom environment, while controlling for age, gender, and ethnicity/race in the entire data set ( $N = 420$ ). The rudimentary objective of a regression analysis is to analyze relationships through data (Kahane, 2001); therefore, a multiple regression analysis was used in this study to determine if classroom environment predicted final course grades in the dual credit course, while controlling for the effects of age, gender, and ethnicity/race. A multiple regression analysis was selected due to its popularity and effectiveness in many disciplines (Tabachnick &

Fidell, 2013) and its reputation for being the most commonly used statistical technique in the social sciences (Allison, 1999).

Ethnicity/Race White was excluded from the multiple regression and used as the constant, since it had the largest ethnicity/race concentration of students in the full data set. Gender was coded using a 0 for female and a 1 for male. The data revealed that the results were very significant at the  $p < .01$  for the relationship between final grades and classroom environment ( $p = < .001$ ), significant at the  $p < .05$  for the relationship between final grades and gender ( $p = .017$ ), non-significant at the  $p > .05$  for the relationship between final grades and age, and non-significant at the  $p > .05$  for the relationship between final grades and ethnicity/race.

**Table 4.5**

*Multiple Regression Analysis of Classroom Environment on Final Grades*

Variable	<i>B</i>	SE	$\beta$	t	Sig.
Constant <sup>a</sup>	3.000	1.578		1.902	.058
Gender <sup>b</sup>	-.294*	.123	-.111	-2.388	.017
Environment	.999***	.153	.304	6.521	<.001
Age	-.076	.097	-.037	-.788	.431
Black	-.186	.145	-.063	-1.281	.201
Hispanic	.017	.188	.004	.089	.929
Unknown	-.126	.166	-.037	-.763	.446

*Note.*  $N = 420$ . The impact of classroom environment on final grades was examined. Control variables of age, gender, and ethnicity/race were entered to predict the effect of classroom environment on final grades. <sup>a</sup>Constant = Ethnicity/Race White. <sup>b</sup>Female = 0, Male = 1. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

A multiple regression was conducted to examine whether classroom environment predicted final grades of ECHS students who completed a dual credit English 101 course. The model included age, gender, and ethnicity/race as control variables. The regression coefficients

indicated how much the final grade changed as a result of an incremental unit change in the independent or control variables while holding all other variables constant. The analysis revealed that classroom environment and gender significantly contributed to the regression model. As can be seen in Table 4.5, classroom environment had a significant positive regression coefficient ( $\beta = .304, p < .001$ ), indicating that students in the high school classroom environment earned significantly higher final grades than students in the college classroom. The analysis showed that the predicted final grade score increased by .999 if the student completed the English 101 dual enrollment course in the high school classroom environment. Gender had a significant negative regression coefficient, ( $\beta = -.111, p = .017$ ) indicating that ECHS female students in both subsamples earned significantly higher final letter grades than their male counterparts. The analysis showed that the predicted final grade score decreased by .294 when male students completed the English 101 dual enrollment course versus female students.

The model revealed age and ethnicity/race did not significantly contribute to the regression model. As can be seen in Table 4.5, age had a negative regression coefficient ( $\beta = -.037, p > .05$ ) which was not significant, indicating that age had no quantifiable effect on final grades. The analysis showed that the predicted final grade score decreased by .076 based on students age. Ethnicity/race also had no significant finding as reflected by regression coefficients, Black ( $\beta = -.063$ ), Hispanic ( $\beta = .004$ ), and Unknown ( $\beta = -.037$ ), all at the  $p > .05$  level, indicating that ethnicity/race had no quantifiable effect on final grades. The analysis showed that the predicted final grade score decreased by .186 for Black students, increased by .017 for Hispanic students, and decreased by .126 for students with an Unknown ethnicity/race.

Overall, the multiple regression analysis determined that a very strong relationship existed between final grades and classroom environment, as demonstrated by a predicted grade

that was 1.02 higher for high school classroom environment students compared with college classroom students. The multiple regression analysis also determined that a strong relationship existed between final grades and gender, with the other variables held constant. The data revealed that females, on average, had a higher predicted GPA than males in the total data set. The data revealed that the results were very significant at the  $p < .01$  for the relationship between final grades and classroom environment ( $p = < .001$ ), significant at the  $p < .05$  for the relationship between final grades and gender ( $p = .017$ ), non-significant at the  $p > .05$  for the relationship between final grades and age, and non-significant at the  $p > .05$  for the relationship between final grades and ethnicity/race.

### **Conclusion**

This chapter presented demographic data using descriptive statistics to describe the percentages, frequencies, ranges, means, and standard deviations of the entire data set, as well as the two smaller samples: 1) high school classroom environment students and 2) college classroom environment students. A Pearson  $r$  correlation was used to compute the strength and direction of the relationship between the dependent variable and the independent variables, while a multiple regression analysis was used to examine whether classroom environment predicted final grades of ECHS students who completed a dual credit English 101 course.

There were three major results in this study. First, a very strong relationship existed between classroom environment and final grades of ECHS students, as shown through a Pearson  $r$  correlation of .312, a positive regression coefficient of .304, and a statistical significance of  $p < .01$  ( $p = < .001$ ). The descriptive statistics revealed that ECHS students in the high school classroom environment earned an average of 1.02 points higher than their peers in the college classroom environment, which accounted for full letter grade differential.

The second major finding was a strong relationship between gender and final grades of ECHS students, as shown through a Pearson  $r$  correlation of  $-.143$ , a negative regression coefficient of  $-.111$ , and a statistical significance of  $p < .05$ . The data revealed that females, on average, scored higher than males in the total data set. There was little to no relationship and no statistical significance between final grades and age or final grades and ethnicity/race.

The third major finding was the abnormality of the histogram. The researcher sought to determine whether the frequency distribution would be represented as a normal bell curve. And, at the conclusion of the study, none of the histograms represented the normal bell curve. The histogram for the total data had a tail that was skewed to the left showing most grades at the 2.00 level or 3.00 level. The histogram for the high school classroom environment students was also skewed to the left, showing that most grades were at the 2.00 level or 3.00 level. Alternately, the histogram for the college classroom environment showed a bimodal distribution with a majority of the scores falling at the 0.00 level or the 2.00 level.

The results from this study indicated a very significant relationship between final grades and classroom environment and a significant relationship between final grades and gender. Chapter Five provides the conclusions of the study, explains the results, and provides recommendations for future research and implications for practice.

## CHAPTER FIVE

### CONCLUSIONS

When the Early College High School Initiative launched in 2002, traditional dual credit courses taught by college faculty on college campuses were slowly joined by high school instructors teaching dual credit courses in a high school setting. This new classroom environment allowed credentialed high school instructors to teach dual credit students in the comfortable and familiar atmosphere of their own high schools (Berger et al., 2013). However, it also initiated speculation about the inconsistency that various delivery methods and classroom environments could cause for dual credit course instruction (Zinth, 2015). With various instructional modality options available, and dual credit coursework offered in a high school with a credentialed high school instructor or on a college campus with a college faculty member (Adams, 2014; Horn et al., 2016), sometimes varied options caused inconsistency and confusion when the environments were drastically different (Brooks & Young, 2011; Stephenson, 2014). Therefore, some researchers questioned the quality of instruction, the rigor of coursework, and academic preparedness of the students enrolled in dual credit courses offered in various classroom settings (Taylor et al., 2018). This sentiment was echoed by other researchers who posited that dual credit courses offered in multiple locations created concerns over unfair practices, such as biased self-evaluations and grade inflation (Burns et al., 2019). The literature indicating that academic success varied dependent upon the classroom environment, location of the course, and delivery of instruction was abundant (Arnold et al., 2017). However, few studies examined how these variations affected ECHS dually enrolled students.



The purpose of this quantitative study was to fill a gap in the literature by examining if variations existed in the academic success of dually enrolled ECHS students based on their classroom environment and if a relationship existed between classroom environment and final grades of ECHS students. The results of this study could influence the way school administrators and policymakers make decisions about the settings in which dual credit coursework is offered. The study was based on the following research questions:

**Research Question 1: How do final course grades of ECHS students in a college-level English 101 dual credit course vary between high school and college classroom environments?**

Descriptive statistics (range, mean, and standard deviation) were calculated for each classroom environment sample and a histogram was used to compile the final grade scores in a bar chart. The data revealed a final grade score range, mean, and standard deviation ( $range = 0 - 4$ ,  $M = 2.42$ ,  $SD = 1.24$ ) for all students in the data set ( $N = 420$ ), a final grade score range, mean, and standard deviation ( $range = 0 - 4$ ,  $M = 2.60$ ,  $SD = 1.17$ ) for students in the high school classroom environment sample ( $n = 347$ ), and a final grade score range, mean, and standard deviation ( $range = 0 - 4$ ,  $M = 1.58$ ,  $SD = 1.25$ ) for students in the college classroom environment sample ( $n = 73$ ).

The descriptive statistics revealed that ECHS students in the high school classroom environment earned an average of 1.02 points higher than their peers in the college classroom environment, which accounted for full letter grade differential. The data reflected that the high school classroom environment students earned more final letter grade scores at the 2.00 or 3.00, levels revealing a higher number of C or B letter grades than F, D, or A letter grades. In comparison, a majority of the final grade scores for the college classroom environment students

were at the 0.00 or 2.00 level, revealing more F or C letter grades than D, B, or A letter grades for students in that sample.

**Research Question 2: What is the relationship between classroom environment, comprised of classroom location and instructor type, and final course grades of ECHS students, while controlling for the effects of student demographic characteristics?**

A Pearson  $r$  correlation was used to calculate whether a relationship existed, and the strength and direction of that relationship between variables. The analysis determined that a strong relationship was indicated between final grades and classroom environment, as shown by a positive Pearson  $r$  correlation of .312 and a statistical significance of  $p = < .001$ . A strong relationship was also indicated between final grades and gender as shown by a negative Pearson  $r$  correlation -.143 and statistical significance of  $p = .002$ . The analysis showed little to no relationship between final grades and age and little to no relationship between final grades and ethnicity/race.

A multiple regression analysis was used to calculate whether classroom environment predicted students' academic success while controlling for student demographics. The results indicated that a very strong relationship existed between classroom environment, comprised of classroom location and instructor type, and final grades of ECHS students. The data revealed a statistically significant finding at the  $p < .01$  level, indicating that the classroom environment had a measurable effect on final grades of ECHS dually enrolled students as shown through a positive regression coefficient of .304, and a statistical significance of  $p = < .001$ .

The results of the multiple regression analysis also indicated a strong relationship between gender and final grades of ECHS students. The data revealed a statistically significant finding at the  $p < .05$  level, indicating that gender had a measurable effect on final grades of

ECHS dually enrolled students as shown through a negative regression coefficient of  $-.111$ , and a statistical significance of  $p = .017$ . The data revealed that females, on average, scored higher than males in the total data set. The analysis showed little to no relationship and no statistical significance between final grades and age of ECHS students, concluding that age had no measurable effect on final grades of ECHS dually enrolled students and little to no relationship and no statistically significance between final grades and ethnicity/race of ECHS students, concluding that ethnicity/race had no measurable effect on final grades of ECHS dually enrolled students.

### **Discussion**

The purpose of this quantitative study was to determine if a relationship existed between variations in the classroom environment and final grades of ECHS students. Specifically, if variations existed in final grades of ECHS students enrolled in an English 101 dual credit course based on classroom environment, defined as the physical location of the classroom and the type of instructor teaching the class. Three theories were used as a framework for this study, including Vincent Tinto's Theory of Student Departure (Braxton et al., 2000), Alexander Astin's Theory of Student Involvement (Richmond, 1986), and Self-Determination Theory (Ford, 2019). This study's framework posited that students could achieve higher levels of success if they were immersed in effective learning environments with support systems and relationship-building, characteristic of a comfortable and familiar atmosphere.

This study provides evidence that variances can exist dependent upon the environment in which the course is completed. Students in the high school classroom environment scored an average full letter grade higher than their peers in the college classroom environment. Without additional research, it is difficult to assess the reasons for this vast grade differential. However,

the results are conclusive with the literature that states a correlation exists between effective classroom environments and academic success of students (Wilson-Fleming & Wilson-Younger, 2012). The results of this study are also supported by the theoretical framework, which highlighted the significance that support systems and student-faculty relationship building have on student success, especially in an ECHS atmosphere (Burch et al., 2015; Ford, 2019).

The ECHS model is an environment of support, respect, and responsibility where students feel a sense of safety and security in the school atmosphere (Ongaga, 2010). These institutions, built on family support, relationship building, and connections with peers are described by students as a place where diversity, respect, responsibility, safety, learning, and caring are the cornerstones of the institution (Cravey, 2013). The ECHS students in this study scored a full letter grade higher in the high school classroom than in the college classroom. There are many reasons that this varying academic success could have occurred, but without further research it is difficult to make a definitive conclusion. However, one claim of this study presumes that ECHS students in the high school classroom achieved higher final grades due to the supportive atmosphere and student-faculty relationships offered in the ECHS high school environment that may have been lacking in the college classroom environment. It is possible that students enrolled in the same class on the college campus did not receive enough support and attention to be successful.

Research supports this claim, stating that dual enrollment students often felt more comfortable with their high school instructor because of the level of support, care, validation, and concern that they provided (Kanny, 2015). The high school classroom is more suited for dual enrollment because of the clear messages to students about expectations, consequences, and guidance (Karp, 2015). One study comparing dual credit courses completed on a college campus

to dual credit courses completed on a high school campus, revealed that the high school consistently predicted higher levels of student success (Phelps & Chan, 2016). ECHS's pride themselves on providing a high-quality learning environment with rigorous courses and instruction, positive relationships, extensive student support, and teachers who take responsibility for student learning (Bernstein et al., 2014).

An alternate interpretation of the results could be that the data is skewed because there is less rigor in college-level courses taught in a high school classroom versus a college classroom due to the credentialing of high school teachers and their inability to teach college-level courses (Zinth, 2015). In a study similar to this, it was determined that dual enrollment students taught by a credentialed high school teacher had significantly more A and B letter grades than expected while dual enrollment students taught by the college faculty member had significantly more D and F letter grades than expected (Hebert, 2001). Even though this study had similar results since the ECHS students scored a full letter grade higher in the high school classroom than in the college classroom, there are many reasons that this varying academic success could have occurred. Without further research it is difficult to make a definitive conclusion; however, a secondary aspect of this study seems to presume that less rigor coupled with grade inflation could have allowed the students in the high school classroom to achieve higher final grades in the ECHS atmosphere than those students enrolled in the same class on the college campus (Burns et al., 2019).

### **Limitations**

Although this study provided valuable information on the relationship between classroom environment and academic success, one limitation of the study was the geographical location.

The study was limited to junior and senior-level dually enrolled students that completed English 101 from one specific ECHS and one specific community/technical college located in the state of South Carolina from years 2014 to 2019. The sample sizes were small and disproportionate, since the high school classroom environment students ( $n = 347$ ) comprised a majority of the total data set ( $N = 420$ ), while the college classroom environment students ( $n = 73$ ) comprised only a small portion. The small geographic area and number of students in this study made it difficult to provide generalizations and may not be representative of the entire ECHS dual enrollment population, due to the modest size of the data set.

A second limitation to this study included the lack of selection process for the instructors. In this study, there was no control over instructor selection; therefore, variations in teaching style and years of experience could have affected the outcome of the data analysis. Additionally, there were inconsistencies in the instructors teaching the courses. There was one instructor in the high school classroom environment that taught all of the sections during all five years of the study, while the college classroom environment students were taught by multiple instructors over the course of five years.

The third limitation was the quantitative design utilizing existing data and a lack of qualitative data. Additional survey data could have provided instructor and student perspectives of the two environments to help determine the reasons why students had higher levels of academic success in the high school classroom environment versus the college classroom environment. The last limitation was the lack of literature on this specific topic. There was some research that studied the effects of classroom location and instructor type on academic success of dual enrollment students, but much less that focused on ECHS students. An absence of literature made it difficult to compare this study to the results of others.

### **Recommendations for Future Research**

There is a strong relationship between final grades of ECHS students and classroom environment; therefore, instructional models should be continually evaluated to examine the effectiveness of dual enrollment programs and additional research is recommended on this topic. Future researcher should commence that investigates not only how class environment and delivery mode affects learning, but also how important faculty-student relationship building is to academic success (Burch et al., 2015). If more time was available, an explanatory mixed methods study would have been conducted to include interviews with instructors and students on the reasons that variations in academic success rates existed between the high school classroom environment and the college classroom environment. The addition of qualitative data could provide insight into the reasons why such a strong relationship existed between classroom environment and academic success.

Additionally, further studies are recommended that include larger sample sizes and larger geographical areas. Since the study was limited to one specific ECHS and one specific community/technical college, the sample sizes were small and the geographic may not be representative of the entire population. The ECHS selected for this study has received national recognition as a National Blue Ribbon School, which is awarded to schools of excellence. This accolade was achieved due to high standards, real action teaching and learning, and mutual respect between educators and students. The high caliber of this institution could have caused elevated final grade scores that may not have been achieved in other ECHS's. It is recommended to conduct future research with other ECHSs to determine if these results are consistent.

## **Recommendations for Schools**

Vast literature supports the claim that dually enrolled students achieve higher levels of success in a supportive and caring learning environment that is comfortable and familiar. Based on the results of this study, it is recommended that more ECHS instructors become credentialed through the local technical/community college to teach dual credit coursework in the high school classroom environment. The addition of more credentialed instructors in the high school would allow more dual enrollment students to participate in course work in the high school classroom environment, which could lead to higher rates of academic success.

Variations in teaching style and years of experience may have affected the outcome of this study; therefore, more consistency in instruction could enhance learning outcomes. The results of this study showed that students achieved higher levels of academic success when taught by an experienced, long-standing instructor in the high school rather than an array of instructors with varying levels of experience and longevity at the college. It is recommended that a thorough selection process be completed when choosing instructors to teach dual enrollment students, both in the high school classroom and the college classroom.

## **Conclusion**

In Chapter One, a study of dual enrollment students' academic success based on classroom environment was introduced as a topic with little literature base and few relevant studies. Tinto's Theory of Student Departure, Astin's Theory of Student Involvement, and Self-Determination Theory were selected to provide a framework for the study and to guide the reader through a myriad of theoretical research that would set the stage for the next chapter. Chapter Two provided a comprehensive literature review that described the background of dual enrollment programs, the evolution of the ECHS, and the research studies that examined the



effects that classroom location and instructor type have on dually enrolled students. In Chapter Three, the research took form through a detailed description of the methodology, including the research questions, design, population sample, instrumentation, data collection, and data analysis. Descriptive statistics, a Pearson  $r$  correlation, and a multiple regression analysis were selected as the methods by which the data would be analyzed. Chapter Four summarized the results of the data analysis and provided tables and figures to exhibit the results. And, in Chapter Five, the final chapter of this dissertation, the results of the study were summarized, the limitations were reviewed, recommendations were made for future research, and the research questions introduced in Chapter One were answered.

In conclusion, this study addressed a gap in the research and made a significant contribution to the literature on variations in academic success of ECHS students based on classroom environment. This study validates existing literature that classroom location and instructor type have an effect on academic success of dually enrolled students, but also goes one step further to quantify that position by using a quantitative analysis to show, at a statistically significant level, that there is a strong relationship between these variables. This research study narrowed the lens to include ECHS students as a subset of the dual enrollment population and focused on a targeted group of dually enrolled students in two different classroom environments. This study contributed to the research by assessing the relationship between classroom environment and final grades of ECHS and finding a statistically significant relationship at the  $p < .01$  level.

Variables, such as classroom location and instructor type, must be further examined to determine their impact on the final grades of dual enrollment students (Burch et al., 2015). The data analysis did indicate a statistically significant relationship between academic success and

classroom environment. Therefore, it is presumed that this study will influence how school administrators and policymakers design and implement future dual credit coursework offerings, including the delivery of dual credit coursework in an ECHS setting.

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