Interest, Value, and Self-Determination: An Analysis of High School Students' Participation in a Dual Enrollment Environmental Science Course

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Abstract

This research examined the motivations, interests, and perceived value of rural Ohio high school students attributed to enrolling in an environmental science course taught by a University of Findlay instructor. Through surveys, interviews, and document analysis, ten College Credit Plus (CCP) students and four non-CCP students were evaluated. The study found that CCP students showed higher levels of self-determination compared to non-CCP peers, with notable differences in perceptions of capabilities and opportunities. Moreover, the research highlighted the importance of dual enrollment in promoting educational equity and preparing students for success beyond high school. Both CCP and non-CCP students acknowledged the course's value for future planning and personal growth. Additionally, the study underscored the need for autonomy-supportive environments to foster intrinsic motivation and interest in STEM fields, which are crucial for meeting workforce demands and sustaining economic growth.

Dedication

For my sons, Will and Wes, though young in years, your presence has been a constant source of joy and motivation throughout my academic endeavors. Your laughter, hugs, and boundless curiosity serve as reminders of the importance of balance and perspective in the pursuit of knowledge. May your futures be filled with endless possibilities and adventures, guided by the love and support of those around you. To my husband Christopher, whose unwavering love and encouragement have been my rock throughout this journey.

And amidst the academic rigors, I find solace in the unique presence of Leeloo Minai Lekarariba-Laminai-Tchai Ekbat De Sebat, who brings an added dimension of comfort and support to my journey.

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Chapter I. Introduction

Background of the Problem

The United States has recognized the crucial role of science, technology, engineering, and math (STEM) education in driving economic growth, social mobility, and national security. Initiatives like A Nation at Risk, the American Competitive Initiative, and the Strengthening Career and Technical Education for the 21st Century Act have been established to address the decline in STEM achievement and the increasing demand for a skilled workforce. Automation and foreign competition have led to decreased unskilled labor positions, and these factors have contributed to a decline in unskilled labor jobs as many of these tasks can now be automated or outsourced to other countries. As a result, the job market increasingly demands skilled workers who can adapt to technological advancements, engage in problem-solving, and contribute to innovation, shifting the focus to preparing workers with technical knowledge and critical thinking abilities, which requires postsecondary education.

The value of postsecondary education is evident in the growing earnings gap between those with and without degrees (Atchison et al., 2019). Workers with only a high school diploma earn significantly less than those with postsecondary credentials, leading to a higher risk of poverty (Reichardt & Christeson, 2020). Government officials and industry leaders are fully aware that investing in STEM training benefits individuals and contributes to economic growth within communities. By fostering a skilled and educated workforce, the United States aims to remain competitive in the global market and secure its position as a leader in science and innovation.

The Constitution empowers Congress to “promote the progress of science and useful arts,” emphasizing the importance of knowledge and innovation in the nation’s development.

Throughout history, various administrations and policymakers have recognized the significance of investing in STEM education to ensure economic growth, social mobility, and national security. In 1945, under the Roosevelt administration, the National Science Foundation was established to promote scientific and technological advancements. This marked a crucial step in fostering research and education within STEM fields (George et al., 1997). However, despite these initiatives, concerns arose in 1983 when the United States National Commission on Excellence in Education published a report, "A Nation at Risk." The report revealed a decline in science achievement scores among American 17-year-olds and raised the alarm about the country's ability to meet the demands of a changing workforce (U.S. Department of Education, 1983). Recognizing the urgent need to address these challenges, President Ronald Reagan set goals to develop talent and abilities, emphasizing the importance of meeting the demands of a rapidly evolving economy.

The report "A Test of Leadership" was published in 2006 by the Secretary of Education's Commission on the Future of Higher Education, highlighting the need to improve educational outcomes and increase access to STEM education beyond high school (U.S. Department of Education, 2006). Over the years, subsequent administrations, including Presidents George W. Bush, Barack Obama, and Donald Trump, have emphasized the importance of STEM education. Initiatives like the "American Competitive Initiative," the "Educate to Innovate" campaign, and the commitment to developing science and technology capabilities have further solidified the nation's focus on enhancing STEM education (Economic Report of the President, 2011; Sudakova, 2020; U.S. Department of Education, 2006).

The main idea behind national and state policies is that in a knowledge-based society, access to postsecondary STEM education is essential for remaining globally competitive,

promoting social mobility, and ensuring economic growth and national security. The demand for highly skilled workers with technical knowledge and critical thinking abilities continues to rise, making education increasingly crucial for the United States economy (Carnevale & Rose, 2012). To address these concerns and bridge the STEM skills gap, the federal government has stressed the need to increase STEM education and support higher education to prepare the future workforce (Olson & Riordan, 2012). However, challenges remain, and concerns about educational attainment and degree completion persist (Regina Deil-Amen, 2012). Policymakers have focused on high school reform and initiatives like dual enrollment to address the growing demand for a skilled workforce (Bragg et al., 2005).

States like Ohio - which has a strong history of innovations, from the airplane to the light bulb and chewing gum - have positioned themselves as the backbone of U.S. manufacturing. Unfortunately, the reluctance to diversify the composition of their state economy from manufacturing and agriculture has hurt the state's economy (Hicks et al., 2020). Ohio's reliance on outdated mid-20th century economic development and education had been insufficient for crafting a prosperous and growing Ohio in the 21st century. The tendency to favor specific industries or businesses over others stifled new industries and the diversification of the state's economy, resulting in missed opportunities to capitalize on the amenities that contribute to economic growth.

As the dominant economic forces that shape our world have evolved, Ohio largely continues pursuing an economic development strategy designed around the economic forces from a century ago. Ohio holds steadfast to the hope that using economic development subsidies and tax abatements to attract new, large manufacturing plants would return Ohio to its former place as a giant in the U.S. economy. Instead, the winds of economic change push Ohio further

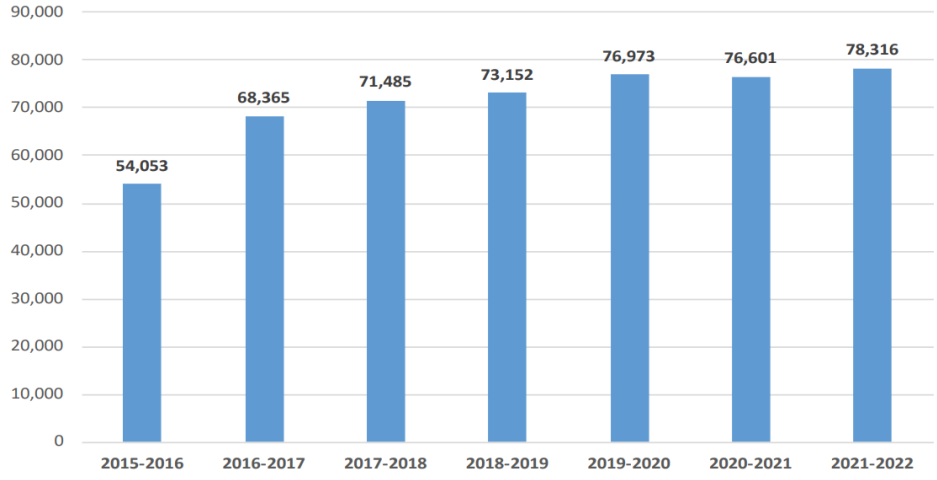
and further behind year after year. Key governmental and educational institutions in Ohio have failed to adapt to the changing economic forces that determine growth in our modern economy (Hicks & Weinstein, 2020).

The key to future economic growth is attracting educated workers through improved educational opportunities and infrastructure. Ohio must address outdated policies, invest in amenities, and retain a skilled workforce to ensure long-term prosperity. In 2014, Ohio passed House Bill 59, establishing the College Credit Plus (CCP) legislation, which has been instrumental in expanding and improving dual enrollment options for high school students (33 Ohio Rev. Code, 2014). The term "dual enrollment" denotes when a student receives both high school and college credit for the same course (Bailey & Hughes, 2002). As per the legislation, all public school districts in Ohio must offer dual enrollment, and public institutions of higher learning must accept dual enrollment students. According to Ma et al. (2016), the plan was to increase the number of Ohioans possessing a certificate or postsecondary credentials. Among other purposes, CCP allows students to earn college credits while still in high school, giving them a head start in pursuing higher education and careers in STEM fields (ODHE, 2023b). Ohio’s commitment to CCP aligns with the broader national efforts to strengthen STEM education and workforce development. Dual enrollment initiatives, like CCP, play a vital role in bridging the gap between high school and higher education, enabling students to explore college-level courses and career pathways (An, 2013b; Bailey & Karp, 2003; Grubb, 2015; Kimi, 2014). By providing students with the opportunity to gain early exposure to STEM education, states across the nation are nurturing a more employable workforce with marketable skills suited for the evolving economy (An & Taylor, 2019; Fink, n.d.; Jenkins & Fink, 2020).

Over the past few decades, high school reform has been the focus of both political and educational reform because of the increasing demand for a skilled workforce (Bragg et al., 2005). Many states, including Ohio, have been exploring innovative approaches to enhance student educational attainment and success in response to this demand. The growing trend in Ohio's education landscape is the CCP dual enrollment program. This program has gained significant traction as a potential solution to increase educational attainment among high school students. According to data in Figure 1, CCP enrollment has witnessed a remarkable expansion over the past seven years, with participants increasing from 54,053 to 78,316, signifying a substantial 45% rise in enrollment (ODHE, 2023b). The table indicates that more students are seizing the opportunity to earn college credits while still in high school, which can provide them with a head start in their academic journey.

Figure 1

Total College Credit Plus Enrollment



Recognizing the importance of postsecondary education, especially in STEM fields, Ohio is taking measures to ensure its people are prepared for the demands of a rapidly changing workforce. The significance of STEM education has grown significantly, with a 79% increase in

STEM fields from 1990 to 2016. Furthermore, 93% of the STEM workforce possess some form of postsecondary education beyond high school, highlighting the relevance of higher education for workforce success and advancement (Graf et al., 2018; U.S. Department of Labor, 2020). Ohio's lawmakers are well aware of the state's need to bolster college and workforce readiness, higher education persistence, and overall educational completion rates to remain competitive in the job market and attract a highly skilled and employable workforce (Harlow, 2018).

To address these educational challenges, state policies have been historically designed to tackle various aspects of the educational system, including funding, accountability, high school-to-college transitions, and establishing partnerships (College in the High School Alliance & Level UP, 2020; Harnish & Lynch, 2005; McLendon & Perna, 2014; Zenith & Barnett, 2018). These policies intend to foster collaboration, and aim to create smoother transitions for students from high school to postsecondary education. Investing in STEM education and workforce development is essential for ensuring the United States' competitiveness. Ohio's ability to attract and retain talent is heavily tied to the state's overall educational attainment, which significantly influences the state's ability to draw in and retain skilled individuals. When a state has a highly educated workforce with diverse skill sets, it becomes more appealing to businesses and industries seeking skilled workers. Initiatives like CCP have the potential to significantly impact college readiness and postsecondary educational attainment, thereby contributing to the state's economic future (ODHE, 2023a).

To maximize the effectiveness and inclusivity of initiatives like CCP, it is vital to understand the factors influencing students' decisions to participate in dual enrollment courses. By identifying and addressing barriers to participation, Ohio can ensure that all students, regardless of their backgrounds, have equal access to educational opportunities and can make

informed decisions about their future. Government officials and industry leaders continue to seek ways to address workforce and employment issues, particularly in bridging the gap between high school and the workforce (Bailey & Karp, 2003). The emphasis lies not only on students earning more through STEM training but also on the positive impact on their communities through service activities and direct contributions to economic growth (Tyack, 2003). By adopting and expanding dual enrollment programs like CCP, Ohio can pave the way for a more skilled and competitive workforce. The state's economic future relies heavily on the educational attainment of its population. Therefore, investing in STEM education and fostering an environment that supports student success post-high school will be instrumental in ensuring long-term prosperity, global competitiveness, and vital drivers of economic growth for states (Tuzeman & Willis, 2013).

Rationale & Significance of the Study

The Federal government has stressed the need to increase STEM degrees, and higher education is needed to prepare the future workforce (Economic Report of the President, 2011; Olson & Riordan, 2012; Sudakova, 2020; U.S. Department of Education, 2022; U.S. Department of Education, 2006). Policymakers have been historically focused on high-school-to-college transitions for STEM careers, supporting workers with a four-year college degree while overlooking half of the STEM jobs available to workers without a 4-year degree (Rothwell, 2013). The divide between secondary and postsecondary experiences exists where students are left without clear expectations of what defines success with regard to the academic expectations placed on them when making the transition into postsecondary education (Karp, 2007; Mehl et al., 2020).

One solution that could substantially improve instances of certificate or degree attainment is a dual enrollment initiative such as CCP. Dual enrollment courses are a partnership between educational systems where communication and collaboration will more effectively engage and prepare students for college or the workforce. Enabling students to earn higher education credits while still attending high school is crucial as it provides cost savings, academic preparedness, and the opportunity to explore different career pathways (Taylor et al., 2022). This measure also addresses the decrease in college degrees, increases training for the knowledge-driven workforce, and enhances college preparedness, ultimately contributing to a more prepared workforce. Within this initiative, students are able to experience college courses and different professional programs to decide whether to move forward on a career pathway promoting college readiness and academic momentum (Lile et al., 2018; Sáenz & Combs, 2015). They may also be better equipped to select appropriate career paths based on their interests and strengths, leading to greater academic motivation and momentum, and empowering them to make informed choices about their future endeavors.

Against the backdrop of historical manufacturing declines, Ohio, like many other states, has grappled with a persistent skills gap, impeding economic growth and leaving many job opportunities unfilled (Hicks et al., 2020). However, dual enrollment programs are stepping in to address this issue and are becoming instrumental in Ohio's educational landscape by offering high school students unparalleled opportunities to gain advanced skills. Collaborations between academic institutions and industry partners enable the development of curricula tailored to meet the specific demands of the job market. For example, Ohio's collaboration with Honda's LG battery plant has led to specialized coursework in sustainable energy, equipping students with skills relevant to Ohio's emerging green technology sector (JobsOhio, 2022, October 11).

With the rise of dual enrollment programs, nurturing a highly educated workforce and addressing the demands of a rapidly changing job market, Ohio is laying the foundation for a sustainable economic future. As the state undergoes this extraordinary metamorphosis, it becomes a magnet for technological advancements, green initiatives, and innovative industries. Ohio's revival hinges on one crucial factor: an educated workforce ready to embrace the opportunities of the new era. Dual enrollment initiatives like CCP offer a pathway for students to develop strong environmental values, increase their awareness, and pursue STEM careers (McMillan et al., 2004). With the knowledge-based economy at its core, Ohio's future prosperity relies on nurturing and empowering a highly educated workforce to lead the charge into a transformative era. The state's educational attainment is a key factor in its economic future and ability to attract and retain talent.

Recognizing the need for its people to increase college readiness and higher education persistence, Ohio has implemented policies to address funding, accountability, and high-school-to-college transitions (College in the High School Alliance, & Level UP, 2020; Harnish & Lynch, 2005; McLendon & Perna, 2014; ODHE, 2023a; Zenith & Barnett, 2018). Governor DeWine of Ohio has continued to increase funding for education with the intent to invest in the individual on the front end of the postsecondary education process, allowing youth to obtain the necessary skills needed to directly enter the workforce with marketable and employable skill sets (ODHE, 2023a; ODHE, 2021; ODHE, 2018). This would allow Ohio to accelerate its efforts to strengthen STEM education, fill the workforce pipeline, and ensure economic prosperity. In contrast, if the investment is not made, the result will be displaced workers with no marketable skill sets in a knowledge-based economy.

The challenge in researching dual enrollment lies in the diversity of how it is implemented across different states and institutions, as well as variations in the program's structure and target student populations (An, 2013a; Juszkiewicz, 2020). This diversity makes it difficult to establish standardized reporting systems, especially considering that dual enrollment students are typically self-selected. The fact that dual enrollment students voluntarily choose to participate in these programs compounds the challenge of drawing generalized conclusions about dual enrollment's impact on students' outcomes, as the student population in each program may differ significantly based on individual choices and preferences. However, previous research has confirmed that dual enrollment programs contribute to educational attainment, making it crucial and worth the time spent to understand dual enrollment's implications on filling the STEM field workforce gap (Fure, n.d.).

The state of Ohio's dual enrollment program, CCP, was implemented during the 2015-2016 school year and has been flexible and dynamic while in its initial development with broad guidelines. While CCP mandates reporting on participation rates and tuition savings, limited information is available on the factors influencing high school students to participate in dual enrollment courses. This study aims to fill this gap by focusing on students' motivations and influences in a specific context: a dual enrollment environmental course with a lab offered on a high school campus. By understanding these factors, the research can accelerate dual enrollment, facilitate smoother transitions into STEM careers, and contribute insights into developing recruitment strategies for dual enrollment courses. Moreover, the study aligns with the concept of career pathways that connect curricula to industry needs, ultimately helping bridge the STEM skills gap in the United States (Hughes & Karp, 2006; Jenkins & Cho, 2013). This research aims

to contribute to the understanding of dual enrollment in Ohio and its broader implications for STEM education and workforce development.

Purpose of Study

This study aims to identify and understand factors that motivate and influence high school students' decisions to participate in a high school-based dual enrollment environmental science course. Despite the increasing participation in dual enrollment programs, little is known about the decision-making process that high school students undergo when selecting their courses (Fink, 2021; Jenkins & Fink, 2020; Marken et al., 2013; Taie & Lewis, 2020). Few studies have provided insight into the factors influencing individual course choice. In addition, the current literature has not identified specific factors that may lead to higher student participation in STEM) education. The researcher seeks to identify the students' values in the course, which may enable them to build on their interests and passions and apply the subject material to their future lives.

The impact of college environmental science courses has shown that students can develop stronger environmental values, which in turn can increase their awareness and open a new career opportunity (McMillan et al., 2004). An and Taylor (2019) asserted that the implementing of dual enrollment programs, such as CCP in Ohio, holds the potential to reduce the educational gaps and increase access to higher education, benefiting individuals and supporting communities. In order to ensure that these policies are effective and equitable, it is necessary to analyze their efficiency and connect reform efforts to student participation.

Researchers and policymakers continue to weigh the outcomes of various studies indicating positive student success (An, 2013b; Bailey & Karp, 2003; Grubb, 2015; Kimi, 2014). However, further research is still needed to understand the motivating factors behind dual

enrollment pathway opportunities, particularly from the perspective of students (Taylor et al., 2022). Motivational theories are used as the conceptual framework to assess the aspects of autonomy, interest, competence, or self-worth, and self-determination will serve as the conceptual framework to assess these factors (Murray, 2011; Ryan & Deci, 2017).

Theoretical Framework

This study is guided by the self-determination theory (SDT), which provides a framework for understanding motivation and self-determination factors. Edward Deci and Richard Ryan (2000a) identified multiple layers of intrinsic motivation and how they are related to and affected by extrinsic motivation. This theory is unique in that two goals with the same expectations may not have the same quality of performance or affective experience due to the content and context of the individual's motivation (Ryan & Deci, 2000b). The self-determination theory recognized that all people have three basic needs to experience well-being: competence, relatedness, and autonomy, and if these needs are not met, then the result is a diminished sense of well-being (Deci & Ryan, 2000a). In essence, SDT believes that people are capable of motivating themselves to their fullest potential if a person's intrinsic motivations are met and supported (Deci & Ryan, 2002; Deci & Ryan, 2008). When a person's basic psychological needs are satisfied, their goals and aspirations become intrinsic in nature, and those intrinsic goals can then be associated with behaviors and actions that are considered 'self-determined' goals (Deci & Ryan, 2000b). Hence, when the three basic needs of competence, relatedness, and autonomy are met, a person would engage in behaviors that assist in attaining those goals that are related to the level of psychological well-being experienced.

Deci and Ryan (1985) found a need to expand the SDT framework and created the concept of causality orientation. The causality orientation of the SDT describes individual

differences in people's experience and behavior. The three orientations (autonomy, control, and impersonal) are related to the level of awareness, interpretation or experience of needs and emotions, self-related cognitions and affects, as well as types and qualities of behavior people engage. The results of these events depend on how they were experienced or interpreted; thus, there were substantial differences in the interpretation of initiating or regulatory events or orientation. Deci and Ryan (1985) hypothesize that everyone, to a degree, is oriented to each other in each of these three ways, and they intended to measure the strength of each of them to determine if each orientation would allow for the prediction of autonomy, control, and impersonal behaviors. He felt there should be a scale to measure the level of orientation within each person rather than classify a person as being only one of the three types. The SDS mini-theory Causality Orientations Theory (COT) allows for identifying to what extent a person's interest and value of what is occurring, being proactive in exploring the opportunity to grow (autonomy orientation); focus on rewards, approval, and external contingencies (control orientation); or the focus of fears of failure or need for safety (impersonal orientation). Each orientation can be different based on the function of context salient to an individual, and by determining the strength of each of these orientations, people's causality would explain the amount of variance in their behavior. Deci and Ryan's (1985) research provided the first evidence that autonomy orientation promotes self-determination, control orientation relates to pressured compliance (or rebellion), and impersonal orientation promotes motivation. This study provided additional support for SDT by confirming that all individuals have each of these orientations. It builds on SDT by recognizing situations that can lead people to emphasize one situation over others to different degrees. Niemiec and Ryan (2009) observed that students participate in activities and interests they value and pursue in the classroom and through this gain

competence and relatedness. If a student experiences competence, relatedness, and autonomy in a subject, the result could likely be what we decide to pursue as a career or other opportunities for students.

The challenge of research involving dual enrollment has to do with the diversity of implementations by states and institutions and the program's structure and target students (An, 2013a; Juszkiewicz, 2020). Each state may have its own unique dual enrollment policies and practices, making it difficult to draw generalized conclusions about dual enrollment as a whole. Furthermore, the specific program structures and criteria for participation can vary significantly between institutions, adding another layer of complexity to the research. To comprehensively understand the impact and effectiveness of dual enrollment, researchers need to consider the state and institution, recognizing the nuances and differences that exist in different contexts.

The unique nature of dual enrollment students does not allow them to fit into established reporting. Dual enrollment students are self-selected participants, which poses challenges when fitting them into standard reporting and research methodologies. However, this self-selection aspect of the dual enrollment programs is why SDT is an ideal framework because it focuses on the motivation and influence of students who have chosen to participate in dual enrollment. SDT allows a focus on understanding the motivations and influences behind a high school student’s decision to participate in a dual enrollment STEM career pathway. By identifying these factors, researchers, educators, and policymakers can better assess the outcomes of various studies indicating positive student success (An, 2013b; Bailey & Karp, 2003; Grubb, 2015; Kimi, 2014). Currently, there is a lack of understanding regarding the motivating factors that lead students to choose dual enrollment pathways, and this knowledge gap is significant given the pressing need

for effective high school-to-workforce transitions and accelerated workforce development initiatives to prepare future workforce at an earlier age (Plucker et al., 2006).

In order to support the demand for postsecondary education attainment, it is essential to understand student motivation. The student's motivation for their education decisions should be the primary focus as researchers look to design an educational environment of success that produces essential outcomes for our students and the community. Dual enrollment career pathway success provides a possible remedy for postsecondary training challenges for the workforce and college degree attainment. Insights gained by this research about the student population's motivation to choose and attain postsecondary training may lead to solutions to the challenges encountered by economic need and educational demand. The actions of motivated individuals are self-determined, and dual enrollment students are self-selected and seeking information on careers, programs, and options congruent with their own interests and personalities (Deci et al., 1991). Dual enrollment offers students the freedom to pursue educational goals and career options because they are able to align with their self-interests.

Research Questions

The following research questions guided this study of dual enrollment:

1. What self-determined interests motivated high school students' decision to participate in a College Credit Plus Environmental and Society course?
2. How do the factors influencing the College Credit Plus Environmental and Society students compare to those influencing the typical dual enrollment student decision to participate in dual enrollment?
3. What value do students perceive in participation in a College Credit Plus Environmental and Society course?

Definition of Terms

Career pathway - A specific sequence of educational coursework defines a clear road map and guides students to complete a credential or degree (Jenkins & Cho, 2013; Symonds et al., 2011).

Postsecondary education –The National Center for Education Statistics (2020a) has defined the term as "an academic, vocational, technical, home study, business, professional, or other school, college or university … for attainment of educational, professional, or vocational objectives".

Dual enrollment – The opportunity for high school students to take college-level courses that count as both high school and college credit; an earned academic credit recognized by both the high school and college institutions (Andrews & Barnett, 2002; Glossary of Education Reform, 2013).

Skills gap – A disparity between the skills and credentials needed in the workforce and the skill set that the workers possess (Zarifa et al., 2019).

Environmental science – The study of how humans interact with their environment and the impact of those interactions on the planet. It involves examining issues like pollution, climate change, and habitat destruction to find solutions for a sustainable future (Manahan, 1997).

Subjectivity & Researcher Positionality

As a researcher, my personal interest in environmental science and dual enrollment may influence my interpretation of the data collected. I have always been passionate about environmental issues and strongly believe in the importance of promoting environmental issues and awareness among young individuals. It is also important to acknowledge that my prior experiences with my two children may influence the way I approach the topic of dual enrollment.

This prior experience could significantly influence the perspective and approach when discussing the topic of dual enrollment and shape beliefs, feelings, and attitudes toward the program. While I will strive to maintain objectivity during the research process, it is crucial to acknowledge the potential influence of my own perspectives and biases. I employed research methods such as triangulation to mitigate this potential impact.

As an advocate for educational equity, my positionality in this study was informed by a commitment to addressing educational disparities and promoting equal opportunities for all students. I was particularly interested in examining how dual enrollment courses provided students access to advanced coursework. Nonetheless, I remained open to diverse viewpoints, engaged in reflective practices, and sought to provide a comprehensive analysis of the research topic.

Chapter II. Literature Review

This review examines the literature on student career plan development, sources of postsecondary influence that leads to the exploration of dual enrollment programs; as well as the benefits, impacts, and challenges of dual enrollment policy.

To remain competitive in the international market, the United States relies on the STEM workforce. As a nation, we embrace industrialization; and technology is changing the landscape of the work environment. STEM fields have a direct role in driving the economy and its growth. The need for a skilled workforce with technical knowledge and critical thinking capacity continues to rise, which means the demand for unskilled labor will subsequently decrease. The workforce's advancement simply cannot expand or improve without highly skilled professional jobs that will require some postsecondary education (Carnevale & Rose, 2012). The shortage of skilled workers will lead to a need, affecting both productivity and the economy's growth. As such, education will become increasingly crucial to the United States economy. Education as a component of the workforce pipeline is progressively more important when a high school diploma or less will not make a worker marketable to fill the growing demand for STEM positions.

The Federal government has stressed the need to increase STEM degrees, and higher education is needed to prepare the future workforce (Olson & Riordan, 2012). However, a divide continues to exist between secondary and postsecondary experiences. Students are left without clear expectations of what defines success with regard to the academic expectations placed on them when making the transition into postsecondary education (Karp, 2007). Dual enrollment courses are a partnership between educational systems where communication and collaboration will more effectively engage and prepare students for college or the workforce.

The focus of dual enrollment among high school students is becoming a vital role in career and workforce development, which has not been fully understood (Ali & Saunders, 2009). Despite various studies indicating positive student outcomes with dual enrollment, there is limited research investigating how to utilize dual enrollment as a career development tool (An, 2013a; Baily & Karp, 2003; Grubb, 2015; Kimi, 2014). Research is still needed to understand the motivating factors for dual enrollment pathway opportunities from a student's perspective.

2.1 Sources of Influence on Postsecondary Outcomes

2.1.1 Self-Efficiency

A student's social identity and self-concept influence their decisions during the crucial years of adolescence (Robnett & Leaper, 2013). Students' self-efficacy directly impacts learning experiences through strengthening the belief they have in their potential to succeed (Ali & Saunders, 2009). In a social cognitive career theory approach, Turner et al. (2019) uncover individual differences in interest in STEM career paths among 10th-grade students. A higher level of efficacy was a determinant for STEM career paths; however, the study suggests that more research involving students who have enrolled in STEM courses to pursue the STEM pathway are needed (Turner et al., 2019).

Science identity and commitment to a STEM profession are enhanced by targeted career development programs (Salto et al., 2014). According to social cognition theory, changes in self-efficacy beliefs may cause changes in the career decision process through mentoring and the students experience essential gains in improving science abilities, confidence in science ability, and enthusiasm to pursue a career in science. However, Salto et al. (2014) maintain that resources are required to establish targeted development, which gives institutions the option to establish evidence-based STEM pipeline programs, thus clarifying a career path. Institutions are

encouraged to develop evidence-based programs based on research experiences to increase STEM course adherence. Ali and Saunders (2009) used hierarchical regression analysis to evaluate variations in adolescents' development stages and revealed that learning experiences and accomplishments in previous performance significantly led to high self-efficacy and positive performance outcomes. Hence, positive life and learning experiences when introducing career opportunities play a role in the students' perceptions about their ability to imagine themselves in that role; as a result, a student's efficacy directly impacts their ability to select a career.

Palmer et al.'s (2017) research determined that students' level of enjoyment regarding their professional study contributed to goal realization. Gregor et al. (2017), who used a redesigned career aspirations scale, found early identifications of students' interests can improve support in determining the psychometric career aspirations of students in high school. Students try to pick a subject that will boost their enjoyment of that subject in college (Palmer et al., 2017). The findings of the Palmer et al. (2017) study show that students will not reject taking a course if it is required for their future job due to the course's relevance in meeting the end goal of a career. The importance of efficiency in determining STEM career paths cannot be overstated because a student's distinct attitudes, interests, and engagements may promote self-efficacy. Poynton and Lapan (2017) found that various noncognitive skills are predictive of college persistence, which coincides with self-efficacy beliefs, personal agency, and interpersonal skills in supporting success in college. Other studies have identified attitude, interest, and engagement as the intrinsic elements motivating a student's professional career choices (Gregor et al., 2017; Turner et al., 2019).

Individuals choose engineering as a professional path based on their interests (Carrico et al., 2017). The Carrico et al. (2017) research was driven by the necessity to identify the

importance of career and educational information. Adolescents' support in career choice decisions is essential in understanding how their plans come to fruition and how these changes are influenced by family members, teachers, or counselors; therefore, it is critical for an educational system to include high school counselors and educators in the developing a student's professional identity. Students gain vocational knowledge by participating in professional activities (Heusdens et al., 2019). Teachers mentor students, giving them hands-on experience and exposing them to the knowledge of their various professions. Heusdens et al. (2019) claimed that this creates professional modeling for students to develop skills and cognitive dimensions about professional performance in learning contexts. Heusdens et al. indicated that, based on the theory of contextualizing, vocational training is critical for ensuring students can interpret meaning from one concept to another. Carrico et al. (2017) emphasize the importance of giving students an opportunity to learn about and experience a vocation before considering it as a career option, particularly when contemplating career options. Understanding how students become aware of career options could provide insight into how to help them develop a passion for a profession.

Career choice can cause a shift in self-efficacy views (Salto et al., 2014). On the other hand, academic confidence does not always equate to confidence in a professional skill set. A gain in science skills might boost confidence in one's capacity for science, and defining a career path for high school students should lead to success in a postsecondary program (Salto et al., 2014). Reinforcing a students' self-efficacy improves science participation, science skills, and commitment to a STEM profession. Consecutively, students' choices in STEM jobs are influenced by social notions such as socioeconomic position, which is influenced by parents' educational levels, and student friendship networks, which play an essential part in career

aspirations (Robnett & Leaper, 2013). The aspirations of students were found not to be gender-specific by both Palmer et al. (2017) and Gregor et al. (2019). Though in a study looking into family influence on career paths (Chenoweth & Galliher, 2004), gender differences emerged where male students' dominant predictors of college aspirations were influenced by family and peers, while in female students, the prominent factors of college aspirations were influenced by academic preparation and external barriers to college attendance. Reinforcing students' interests and understanding of a professional role is critical to help them select a career pathway that aligns with their self-concept. Due to inexperience with college processes, students lack confidence in manipulating this new, unexplored environment (Bickerstaff et al., 2012). Bickerstaff et al. (2012) highlight self-efficacy development as vital for enabling self-transition in college and, as a result, boosting the knowledge needed to maneuver the challenges of college.

2.1.2 Influence of family/peers and the community

Early intervention and college information are advantageous (Chenoweth & Galliher, 2004), especially for adolescents whose choices are impacted during these formative years (Robnett & Leaper, 2013). The context of a student's environment needs to allow for continued growth, boost the development of skillsets, and encourage early experience. The benefits of early intervention and experience, as per Chenoweth and Galliher (2004), are significant in the impact of college aspirations. Robnett & Leaper (2013) used three models to analyze the data collected from students to review the factors that influenced adolescent choices: Eccles expectancy-value model of motivation, the Cameron three-factor model of public distinctiveness, and the Stake and Mares indicator of program effect on science self-confidence and inspiration. Robnett and Leaper (2013) propose that the theories of expectation-value, social cognition, and self-perception substantiate that ability, beliefs and values are associated with academic achievement.

The Cameron three-factor model of public distinctiveness sees that a person’s environment, and time can influence peoples' responses because their previous experiences will impact current and future responses. The Stake and Mares indicator of program effect on science self-confidence and inspiration: represents the individual's vision of what the self has the potential to become. Adolescent social identities and self-concepts shape choices during adolescences' formative years. Research reveals that early intervention, presenting college information, and exposure to various professions as early as possible are effective in helping a student identify and develop higher aspirations (Robnett & Leaper, 2013).

Adolescents' educational development should be considered when creating programs. Negoiţă (2021) asserts that learning development instruments are critical for influencing educational partners' growth, which translates to good educational development. Utilizing an instrument such as activities developed in partnership with organizations that can be integrated into educational classes provide an immersion into real-world applications. Encouraging youth participation in career fairs from the age of 16 is another tool which introduces networking and face-to-face interactions with individuals practicing their field of interest. Family members are also fundamental in creating learning environments where open discussions on life-related learning, such as cooking or car care, provide opportunities for youth to gain exposure to diverse skillsets. Negoiţă (2021) shows how integrating an individual's social and personal growth into an educational setting can enhance learning opportunities. Working with educators and counselors to develop personally and socially is important in determining developmental requirements and encouraging active involvement in a student's growth based on personal interests and goals (Negoiţă, 2021). Adolescents' developmental requirements and goals serve as

a source of lessons and instructions on how to provide appropriate education to various learning platforms so that educational agents can deliver effective learning programs.

Parents, teachers, counselors, and school administrators all have essential roles in introducing adolescents to professionals in many career fields (Carrico et al., 2014). Early postsecondary planning, academic proficiency, and consulting with school counselors for college and career counseling support are all indicators of success for high school to career or college readiness (Poynton & Lapan, 2017). Establishing college and career counseling services is crucial for students who want to transition to the workforce or enter college and graduate to provide students with an opportunity to learn about and experience a vocation before considering it a career option. Understanding how students become aware of career options could provide insight into how to help them develop a passion for a profession (Carrico et al., 2014). As Carrico et al. (2014) suggest, parents, teachers, counselors, and school administrators may significantly impact children's career goals, especially when a deliberate effort is made to introduce students to professionals in various occupations and careers. Hence, educators must be aware of the intricacies of how to transition students into postsecondary careers (Desjardins et al., 2019). Poynton and Lapan (2017) show the importance of including high-quality education programs and providing effective career counseling services to help navigate the transition to college. According to Poynton and Lapan (2017), postsecondary goals and academic proficiency are impacted by the ratio of students-to-counselors and what the counselor does with their time. For example, evidence shows that personalized counseling services provide support services needed to develop more effective career and college readiness counseling methods.

DesJardins et al. (2019) explain students' natural tendency to reevaluate risk as they gain new knowledge about financial aid, academic achievement, and other essential aspects lead to

strategically maneuvering postsecondary attainment. Studies of secondary to postsecondary educational transitions find that first-generation and low-income families require capital for their children to progress from aspirations to attachment (Dyce et al., 2013). DesJardins et al.'s (2019) research outlined the influence of significant changes in students' ambitions. Dyce et al. (2013) wanted to learn more about the relationship between high school students' aspirations and their parents' confidence, as well as the consequences of achieving those aspirations. The Mann-Whitney U test was used to evaluate data on different ways in which parents gained financial knowledge about paying for college in a study involving 9th-grade pupils. The study found that most families are willing to make financial sacrifices for their children's education if they have sufficient knowledge to guide them. A high school student's career aspirations are directly linked to a parent's influence; subsequently, a parent's influence over a student's career aspirations is a significant factor that necessitates consideration when advising a student on future career strategies. Grant (2017) emphasizes the importance of educators understanding various influencing factors when helping young people plan for college, such as the importance of attachment and keeping connected to the community, the fear of failing, and balancing family expectations and school. The next step in research on factors that influence college aspirations should include culture and a qualitative aspect to better comprehend the results implicated by family, peer, and school settings as having significant cultural impacts (Chenoweth & Galliher, 2004).

The student's decision to pursue higher education is significantly influenced by their parents’ level of education (Sharp et al., 2020). Students whose parents did not attend college created a barrier that prohibited them from accessing information and services, which prevented them from achieving their educational and career goals (Kim et al., 2019). Students' future

aspirations in connection to higher education are shaped by their social class and societal expectations, impacting behavior and contributing to creating future aspirations (Grant, 2017). Sharp et al. (2020) found that rural high school teenagers' future aspirations and high school experiences influence the adult goals they set for themselves. Sharp et al. (2020) claim that a lack of expectations prevents students from accomplishing their career goals. Kim et al. (2019) suggest that better educational and occupational expectations correspond with a higher rate of pay than under-aligned educational and occupational ambitions. Educational settings can determine the professional expectations relevant to career goals, which encourages the examination of various career orientation settings necessary for adolescent learning (Sharp et al., 2020). Kim et al. (2019) explore the relationship between data from a youth survey and labor market outcomes, focusing on the aligned and misaligned relationships between teenagers' vocational and educational expectations. In Kim et al. (2019), the Bonferroni criteria were used to examine 12th graders with strong ambitions, and expectations resulted in a high score; however, the Sharp et al. (2020) study showed that a lack of expectations prevented the students from accomplishing their goals.

Gibbons et al. (2020) conducted a study to determine how rural high school students see educational and vocational constraints. Due to the importance of a students' culture, it will impact how they view hurdles to their ability to attend college. The adolescent lens these students are using does not allow them to understand additional barriers until they are in college (Gibbons et al., 2020). Students' cultures have an impact on how they view hurdles to their ability to attend college. For example, a family culture may place the needs of the family over those of the individual; therefore, if going away to attain a college degree would take a child away from a family who needs them to help care for younger siblings, there would be a negative

influence on the decision to attend college. Gibbons et al. (2020) impress the importance of raising awareness of perceived educational and occupational constraints. The lack of tangible information about career and postsecondary opportunities leads to students selecting familiar professions.

Sadler et al. (2014) studied students who had an initial interest in STEM and background in courses outside the STEM field, and the findings demonstrated that exposure to advanced scientific and mathematics curricula in high school is connected with greater STEM interest. Advanced curriculum in high school is linked to a greater concentration in STEM areas (Sáenz & Combs, 2015). Creating and utilizing advanced coursework in high school is one option for boosting the proportion of students who complete degrees and enhancing college readiness among students who want to attend college (Sáenz & Combs, 2015). When Moustakas' phenomenological design is utilized to evaluate an individual's prior experiences, perceived problems, and making sense of their personal and social environment, the focus is on the individual's experience and behavior as an inseparable relationship. Sáenz & Comb's (2015) study supports Moustakas' phenomenological design by highlighting the relationship between focus groups and individual interview experiences with academic rigor and outcome behaviors. As per Sáenz and Combs (2015), due to the increased academic rigor and resources, students will build confidence, independence, responsibility, and commitment to academic interests. The increase in a student’s confidence, independence, responsibility, and commitment results in enhanced self-awareness and self-esteem.

According to Dyce et al. (2013), information about college access and essential resources should be given to both kids and their parents. The necessity to disseminate information arises because parents are willing to make sacrifices if given a path to success. By implementing a

mixed-method survey among 9th-grade students, Dyce et al. (2013) were able to understand high school students and their parents' confidence in college aspirations and their impact on attainment. They discovered that first-generation and low-income families must recognize social capital to help move from aspiration to achievement.

2.2 Dual Enrollment

2.2.1 Dual Enrollment and Postsecondary Attainment

The literature on dual enrollment supports a national goal of increasing postsecondary certification and degree attainment (Grubb et al., 2017; Starkey, 2020; Sublett & Tovar, 2021; Taylor et al., 2022). The U.S. economy faces a problematic labor shortage for businesses; the federal and state legislation makes clear that policymakers have long grappled with the best way to promote effective training and education of the modern workforce (Sublett & Tovar, 2021). As a result of this research, three primary explanations have been developed to describe how and why dual enrollment has been identified as an educational improvement tool. The first is the larger national movement toward college and career readiness. The second is the researchers, policymakers, and advocates for closing the skills gaps, which are supported through research by Grubb et al. (2017), Sublett and Tovar (2021), and Taylor et al. (2022). Thirdly, is the Trump administration's influence and support for apprenticeships and the reauthorization of the Carl D. Perkins Act of 1984 (Sublett & Tovar, 2021). The Perkins Act was originally implemented to create programs to boost students' employability through competitive learning targets legislation supporting Career Technical Education (CTE). The Perkins legislation was designed to create alignment between local labor market demands and student participation in postsecondary higher education. These career pathways tie curricula to industry needs, and a specific sequence of

courses is used as a guided pathway using dual enrollment (Hughes & Karp, 2006; Jenkins & Cho, 2013).

A study performed by Starkey (2020) calls attention to the national discussion of dual enrollment, highlighting that students who participate in dual enrollment are more likely to go to college than their non-dual enrollment counterparts, revealing they have a college readiness advantage. By identifying the dual enrollment impact on college readiness and recognizing the connection between an educated workforce and economic and social well-being, states have started creating policies to implement dual enrollment. The Ohio legislature was among the states which believed dual enrollment would positively impact their state. They implemented the Postsecondary Enrollment Options (PSEO) program in 1989 in response to an agenda to prepare for success in college and the workforce (Smith et al., 2007). Historically, industry and government have worried about the long-term effect of a skilled workforce shortage and how it affects the economy. Sublett and Tovar (2021) research revealed that when a high number of jobs in the economy remain unfilled due to a shift in the use of technology advancements, legislators will begin to feel pressured by education advocacy groups and industry leaders. Legislators will be forced to address technological and educational workforce needs through tools such as dual enrollment. In 2014, a reevaluation of the PSEO program was conducted for precisely this reason, and the response was the creation of the CCP dual enrollment program. Ohio's changes align with recent research by Sublett and Tovar (2021) and Grubb et al. (2017), highlighting that economic development drives educational reforms. CCP establishes pipelines for training and includes appropriate funding, improved college retention and completion rates, as well as expectations to improve access and equity. When evaluating an existing dual enrollment program to identify opportunities for improvement, the focus should be on the three pillars. These three

pillars for a successful dual enrollment program are appropriate funding, improved college retention and completion rates, and expectations to improve access and equity (Sublett & Tovar, 2021).

Though the lens of focus may vary, the research on dual enrollment provides a positive view of the CCP program's benefits and possibilities (An & Taylor, 2019; Grubb et al., 2017; Starkey, 2020; Sublett & Tovar, 2021; Taylor et al., 2022). There is growing evidence that dual enrollment improves postsecondary academic outcomes (Ohio Auditor of State, 2022). Multiple studies have found particularly compelling evidence that dual enrollment programs provide an avenue to complete college in a timely manner and attain postsecondary credentials (ACT, 2015; Bailey & Karp, 2003; Grubb et al., 2017; Hoffman & Robins, 2005; Starkey, 2020). An example would be the data resulting from a survey performed by Grubb et al. (2017), which revealed that outcomes of dual enrollment students were superior to those of nonparticipants. The survey showed that <4% of dual enrollment students were placed on remediation compared to over 11% of their nonparticipant counterparts. The literature on dual enrollment suggested that program participation be reduced by both the time and costs of a college degree, but the most recent implications have been the biggest topic of conversation about access and equity (Zinth & Barnett, 2018). The College Credit Plus program specifically litigates language, which requires educational sessions to inform students and parents of dual enrollment and college. Studies highlight the importance of parental support, which promotes participation and success in dual enrollment programs (Schaller et al., 2023; Starkey, 2020). When information is provided about the benefits of the CCP program, parents are able to understand the financial advantages to their families. Also, providing first-generation college student and their family with CCP information allows them to learn how to navigate the college environment. For example, first-generation

students encounter more difficulty obtaining information and, therefore, are less likely to see the benefits of enrolling or participating in dual enrollment programs. Consequently, students who are making informed decisions have found positive outcomes when participating in dual enrollment.

There are potential limitations and challenges to dual enrollment, including transparency of the funding process, the need for better student advising, and adapting information sessions to reach more students and their families. Based on Starkey's (2020) research, the biggest concern is financing dual enrollment; despite lawmakers' attempts to standardize these cost models, exploring the funding mechanisms of dual enrollment is foundational to the success of dual enrollment policies. Several studies analyzed the funding mechanisms of various programs, revealing significant variations and several detailed the financial implications for both districts and students (Barnett et al., 2004; Barnett & Kim, n.d.; Harnish & Lynch, 2005; Hoffman & Robins, 2005; Sherretz & O'Malley, 2013; Sublett & Tovar, 2021). The issue can be problematic because funding sources and restrictions continue to be obstacles to programs' design and delivery; notably, the common challenge among these programs was the instability or uncertainty of funding.

A factor contributing to the rising costs and time to college degree involves the discrimination of course credits, which is when classes do not transfer to another learning institution (Battle, 2020; Fink & Jenkins, 2021; Freismuth, 2017; ICHE, 2021; Starkey, 2020; Venezia & Jaeger, 2013). Ohio is one of a handful of states that include explicit language in state statutes that ensures the transferability of dual enrollment courses among the state's higher education institutes; however, this does not guarantee they will transfer to out-of-state or private institutions (Fink & Jenkins, 2021; Tobolowsky & Allen, 2016). Taking classes that do not

transfer or do not fit the prerequisites for a student's college degree plan wastes tuition dollars by paying for classes the student does not need (Hodara & Pierson, 2018; Starkey, 2020). This raises criticism of advisory inadequacies; hence, effective orientation and degree planning are needed to balance high school and college courses toward graduation. The researchers found that many potential college students are inadequately informed of the actual cost of pursuing postsecondary education or economic returns before starting postsecondary education (Starkey, 2020; Sublett & Tovar, 2021).

As stated by research, a continuing challenge is that social networks can be related to socioeconomic status, which can influence the amount and quality of information available pertaining to the discussion of pursuing postsecondary education (Sublett & Tovar, 2021; Taylor et al., 2022; Xu et al., 2021). Underrepresented groups' unequal access and participation are a major strain related to dual enrollment programs (Hooker et al., 2021). The lack of information and options about dual enrollment challenges and program needs should be scrutinized and examined to ensure policymakers reach a consensus on what works for students (Osumi, 2010; Sublett & Tovar, 2021).

The CCP dual enrollment is credited for improving and presenting solutions to normalize dual enrollment for academically able students to participate in college coursework rigor, as well as aligning state terminology for dual enrollment and improving data collection for future research (Harlow, 2018). A study conducted by Grubb et al. (2017) identified how dual enrollment policy increased equitable participation in CCP for underrepresented groups and that these groups benefitted the most. In many instances, the barrier for underrepresented populations was that they were not given the opportunity to participate in dual enrollment programs or not take advantage of the opportunity when it was presented. The study revealed that when dual

enrollment is supplemented with counseling and social support for underrepresented students, remediation in college coursework was 29% lower than nonparticipating dual enrollment students (Grubb et al., 2017). This research would imply that dual enrollment is not a benefit to be had solely by top achievers but arguably meets the needs of a wide variety of students. This strengthens the argument that state dual enrollment policies are the prerequisite to effective cooperation between stakeholders.

As per An's (2013) research, race, sex, family status, family composition, the number of brothers and sisters in college, nativity, and language talked at home are all potential influencers in dual enrollment participation. Due to the reciprocal linkages between human agency and environmental circumstances, dual enrollment may serve as a line of defense against disadvantaged youth's risk factors, aiding career planning (Medvide & Blustein, 2010). The motivational variables for dual enrollment programs were not understood by Medvide and Blustein (2010). However, some of the study proposals by Medvide and Blustein (2010) reveal students are motivated to participate in dual enrollment based on their goal orientation. The participation then leads to a growing sense of confidence and optimism about college, resulting from completing dual enrollment courses. Examining data collected would ensure a policy that works and provide a platform to provide relevant data in identifying gaps and provide the ability to quickly change course. Studies have shown that dual enrollment's impact on remediation and completion of rigorous educational courses helps students advance skills; however, standards of implementation for dual enrollment policy do not exist (Grubb et al., 2017; Mehl et al., 2020; Starkey, 2020).

Research shows that designing a successful dual enrollment strategy policy has proven to help high school students connect to higher education (Grubb et al., 2017; Shaller et al., 2023;

Starkey, 2020; Taylor et al., 2022). The research on the effectiveness of dual enrollment is in the early stages, and given the rapid growth and variability in dual enrollment offerings from state to state, it is not easy to discern an exact algorithm or model to follow to properly assess. Consequently, the ability to account for outside factors like student motivation has not been accounted for and will warrant states refining and reevaluating their policies to foster college readiness for high school students.

One solution that could substantially improve instances of certificate or degree attainment is a dual enrollment initiative such as CCP. This would enable students to earn higher education credits while still attending high school. This measure also addresses decreased college degrees, training for the knowledge-driven workforce, and college preparedness. Within this initiative, students decide in tenth grade whether to move forward on a career pathway using dual enrollment (Sáenz & Combs, 2015). This study is one of the few conducted in a technical college environment and it focuses on the perceptions of motivation and influence on students who have chosen to participate in the dual enrollment pathway on a college campus. Furthermore, it accelerates dual enrollment attainment, enables young adults to transition into careers more quickly, and adds insight into the development of recruitment opportunities for the dual enrollment pathways.

There are several issues dual enrollment is believed to address. The CCP initiative is relatively new, and there are only five years of data to corroborate the program impact; however, dual enrollment programs are recognized to address poor academic preparation and low graduation rates (Bound, Lovenheim, & Turner, 2010; Hoffman & Robins, 2005). Allen and Dadgar (2012) demonstrate that the relationship between dual enrollment and a decreased likelihood of students taking a remedial course persists even when considering students'

demographic and academic characteristics. Supporting literature provides evidence that dual enrollment tends to reduce the probability of students needing a remedial course. Grubb et al. (2017) and An (2013b) reported that dual enrollment students are less likely to take a remedial course than nonparticipants. The thought is that the rigor of dual enrollment provides confidence, introduction to the rigor of college coursework, and academic preparation, which reduces the need for remedial courses.

A second issue involves college completion rates. While college participation has grown, one in three first-time, full-time students does not re-enroll for classes the following year (An, 2013b). Dual enrollment programs like CCP help build academic momentum, bridging the transition between postsecondary and higher education through curricular development and leading to a more structured education (Kim, 2014). Increased collaboration between universities and high schools may aid the educational pipelines and encourage students to seek postsecondary careers (Kitchen et al., 2018). Understanding the design of bridge programs and courses that enable high school students to learn more about programs, may help determine professional goals (Kitchen et al., 2018). These bridges lead to self-confidence, self-awareness, and understanding of the postsecondary coursework rigor. Setting the expectations in high school where the students receive support leads to further success in postsecondary degree completion rates.

The latest theory is that dual enrollment may be a way to impact the equity of educational opportunities (College in the High School Alliance & Level Up, 2020; Mehl et al., 2020; Taylor et al., 2022). Socioeconomic disparities have been considered a barrier to academic preparation and attainment (Anderson, 2014; Davis, 2014). A student from a lower socioeconomic status (SES) is less likely to participate in courses that prepare them for college. Dual enrollment is

seen as a potential means of pushing forth diversity and equity to these students because it has the potential to reach a broader range of students. The promise of dual enrollment programs through equal access may lead to improved postsecondary outcomes, career readiness, and college outcomes. Even if the access is unequal across socioeconomic statuses of students, if low-SES students benefit, the program becomes relevant. Grubb et al. (2017) suggest that data such as taking a course, tutor status, course place, and additional factors can be used to increase participation and shape civic strategy to reinforce the connection between secondary and postsecondary institutes by assisting high school students in connecting to and succeeding in higher education.

Participation in dual college courses by high school students has a beneficial impact on college enrollment and completion (College in the High School Alliance & Level Up, 2020; Taylor, 2015; Zinth & Barnett, 2018). Policymakers are confronted with a problem because the findings of this study imply that dual enrollment regulations help underrepresented students, but the effect size for underrepresented students is smaller than the average effect size (Taylor, 2015). Taylor (2015) claims that the dual enrollment approach is inequitable. The recommendation is based on a lack of cultural and social capital required to transfer into and succeed in college. Noncognitive and psychosocial supports for marginalized students are not integrated into dual enrollment programs as part of the transition (Taylor, 2015). Support for underserved kids could include college information sessions and abilities and the development of self-efficacy to help them succeed in college.

2.2.2 Ohio Dual Enrollment Policy

The passage of Ohio House Bill 487 in 2014 restructured funding to establish the CCP legislation to expand and improve dual enrollment options in high schools, career schools, and

charter schools (33 Ohio Rev. Code, 2014). The goal of CCP was to increase postsecondary certificate or degree attainment by 2025, which Ohio lawmakers established. The initial implementation was for the 2015-2016 school year (ODHE, 2018); which the Ohio legislature planned to move forward with the dual enrollment agenda.

Ohio House Bill 487 required data to be collected, reported, and tracked annually; it further specifies the types of data, including (a) the number of participants disaggregated by grade level, socioeconomic status, race, gender, and disability, (b) the number of enrolled courses, completed courses, and credit hours, (c) number of students denied participation in CCP, (d) the number of students who applied to colleges under CCP and denied admission, and (e) the average number of completed courses and average student GPA (R.C. 3365.15(A)). The Ohio Senate Bill 216, passed in 2018, directed the Ohio Department of Education to study the CCP program's cost-effectiveness and prepare a report outlining the findings (33 Ohio Rev. Code, 2018). The CCP program is relatively new, with 2019-2020 annual report data being the fifth year for the program (Ohio Department of Education, 2019). This report substantiated what other research has confirmed that dual enrollment contributes to education attainment; thus, it is well worth the financial investment and time spent to understand the implications of dual enrollment on filling the workforce gap in the STEM field (Ohio Department of Education, 2019; Fure, n.d.).

Ohio's dual enrollment program, CCP, has been flexible and dynamic during its initial development and established with broad guidelines. The program offers a solution that has improved certificate or degree attainment instances utilizing the dual enrollment initiative. This accelerated dual enrollment attainment enables young adults to transition into careers more quickly and adds insight into the development of recruitment opportunities for the dual

enrollment pathways. STEM fields have a direct role in driving the economy and its growth. Ohio legislators recognize the need for citizens to increase college readiness, higher education persistence, and subsequent education completion to stay competitive with an employable workforce. One concern involves the question about college academic preparation. High school reform has focused on both political and educational figures due to the rapidly accelerating demand for a skilled workforce (Bragg et al., 2005). Subsequently, the STEM field has grown 79% between 1990 and 2016, and 93% of the STEM workforce has some form of postsecondary education beyond high school (Graf et al., 2018; U.S. Department of Labor, 2020). The need for a skilled workforce with technical knowledge and critical thinking capacity continues to rise, which means the demand for unskilled labor will subsequently decrease. By incorporating CCP, the intention is that Ohio will have more youth obtaining the necessary skills needed to enter the workforce with a marketable and employable skill set.

The lack of skilled workers is problematic for businesses that worry about the long-term effect on the economy when they require some form of postsecondary education for their business (Dougherty & Lombardi, 2016; Sublett & Tovar, 2021). Hence, the new CCP policy focuses on Ohio's workforce skills gap. Realizing there were some successes with the PSEO policy and the national dual enrollment with positive research outcomes, Ohio legislatures created CCP. Dual enrollment was proven to reduce remediation and assist with timely postsecondary education completion (Grubb et al., 2017; Ohio Department of Higher Education, 2023a). Dual enrollment has been found to provide rigorous education courses during high school, allowing students to overcome any statistical tendencies regardless of gender, race, socioeconomic status, or family structure (Cahalan et al., 2016; Grubb et al., 2017). The nationwide question is how do we create a formula to ensure underprivileged students are

participating in dual enrollment when research shows the leg-up dual enrollment offers this specific population of students.

There are opportunities for enhancing the effectiveness of the CCP program. First, financial literacy and college financial readiness should include textbook fees, parking pass costs, and the impact of failing courses; many students are inadequately informed of the real cost of pursuing college (Hart, 2019; Starkey, 2020). Much of the research surrounding dual enrollment discusses positive student outcomes and the need for more student awareness of the funding policies (Hoffman & Robbins, 2005). Many potential college students are insufficiently informed of the real cost of pursuing postsecondary education or economic returns to specific certificates or degrees.

A second element that could bring added value to the policy would be an entail advising and pathway or degree planning component. Though research points out that many students are not currently advised about employment projections or the importance of degree plans, they do not take classes that will not transfer or do not fit the degree plan, waste resources, time, and money (Battle, 2020; Fink et al., 2023 Starkey, 2020; Venezia & Jaeger, 2013). Rodriguez et al. (2012) suggest social support and counseling would increase equitable participation in dual enrollment. There has been little information collected in regards to advising needs of underrepresented populations. However, Grubb et al. (2017) reveals that most underrepresented students who would benefit from the program are missing an opportunity to take advantage of dual enrollment. National estimates show that racial minoritized and first-generation college students are underrepresented in dual enrollment programs (Taylor et al., 2022). Fink (2021), Shivji and Wilson (2019), and Xu et al. (2021) confirm lower participation rates for students of color and students with parents without college degrees compared to White students and those

with college degrees (Fink et al., 2023). The problem becomes that the accuracy and completeness of information available are not consistent from one student to another (CHSA, 2023; Perna, 2006; Taylor et al., 2022). The student's social networks impact the quality of information available to pursue a postsecondary education (McGowan et al., 2015).

In addition to improving dual enrollment programs, colleges have implemented significant reforms to enhance postsecondary attainment and workforce readiness. Recent research on college reform, particularly the adoption of Guided Pathways, emphasizes the importance of aligning educational pathways with workforce demands (Bailey et al., 2015; Fink & Jenkins, 2020; Jenkins et al., 2018). Guided Pathways initiatives, akin to dual enrollment goals, aim to offer students clearer program choices, proactive support mechanisms, and structured paths toward their educational and career objectives (Fink & Jenkins, 2020; Jenkins et al., 2018). Leveraging insights from dual enrollment research, such as challenges and opportunities identified by Fink and Jenkins (2020), colleges can further refine their reforms to ensure seamless transitions from high school to college and career pathways. Pathway programs offer students a clear roadmap, aligning high school coursework with future educational and career goals (Jenkins et al., n.d.). By fostering partnerships with K-12 districts and schools and investing in coordination with advising and support services, colleges can provide vital guidance to dual enrollment students, streamlining their transition and facilitating exploration of academic and career interests. This proactive approach not only aids in academic planning but also increases the likelihood of postsecondary credential completion. Addressing structural barriers and informational gaps, often hindering underrepresented students' participation in dual enrollment programs, pathway initiatives contribute to greater equity and access in higher education (Fink & Jenkins, 2024; Jenkins et al., 2017).

Research on college reform, especially the adoption of Guided Pathways, illuminates a significant shift in program design and student support structures. Drawing upon the foundational work of Bailey et al. (2015), the Guided Pathways model has emerged as a holistic approach to addressing the limitations of traditional college models, notably the 'cafeteria college' paradigm (Bailey et al., 2015). As colleges nationwide embrace this model, research from the Community College Research Center (CCRC) and other institutions underscores the complex process of implementing Guided Pathways reforms (Jenkins et al., 2018; Fink et al., 2018). Key focus areas include program design, new student onboarding, remediation, ongoing advising, and teaching methods. Initially, efforts centered on simplifying program choices and providing default maps, but subsequent research emphasizes aligning options with students' educational and employment objectives (Jenkins et al., 2018; Fink & Jenkins, 2020). This shift acknowledges the importance of ensuring pathways lead directly to employment or further education without unnecessary credits. Moreover, colleges are reassessing student onboarding and advising, emphasizing career and academic exploration, proactive support, and progress monitoring (Jenkins et al., 2018; Fink etal., 2018). Challenges persist, particularly in addressing equity gaps and expanding experiential learning opportunities, but colleges are increasingly dedicated to improving teaching methods and providing interventions for underserved students (Bailey et al., 2015; Fink & Jenkins, 2020). Ultimately, the Guided Pathways framework offers a means to support student success, advance equity, and adapt to the evolving needs of 21st-century students and job markets (Jenkins et al., 2018; Fink et al., 2018).

Efforts to improve the effectiveness and equity of dual enrollment programs must prioritize addressing the persistent underrepresentation of certain student groups, as highlighted by Fink and Jenkins (2020), Shivji and Wilson (2019), and Xu et al. (2021). National data

consistently reveal lower participation rates among students of color and those with parents lacking college degrees compared to their white counterparts and students from college-educated families (Fink et al., 2023). This disparity underscores the imperative for targeted interventions to ensure equitable access to dual enrollment opportunities. Delivering culturally relevant information sessions, mentorship programs, and tailored academic support services can help alleviate barriers faced by underrepresented students in accessing and succeeding in dual enrollment programs (Fay & Fink, 2023). Additionally, integrating noncognitive and psychosocial supports into program design can strengthen marginalized students' self-efficacy and resilience, facilitating their transition to and persistence in postsecondary education (Fink & Jenkins, 2020; Taylor, 2015). By prioritizing diversity, equity, and inclusion in dual enrollment policies and practices, states can cultivate a more equitable educational environment and empower all students to pursue their academic and career aspirations (Steiger et al., 2023; Fink et al., 2022).

2.2.3 Dual Enrollment Policy and Economic Growth

The objective of K-12 education, according to popular thinking, is to encourage economic development (Shackley, 2020). Students should be given the resources they need to help support capitalistic development and the creation of a skilled labor force (Shackley, 2020). Based on popular perception, more adequate resources must be incorporated to foster capitalistic development and the creation of a quality labor force. Shackley (2020) argues that using STEM education just to repeat high levels of historical inequity is ineffective, necessitating the addition of a more integrated component. A high school diploma is not enough to support a family in today's job market (Carnevale et al., 2017). A goal of increasing degree attainment by 2025 was established in 2014 by Ohio lawmakers with initial implementation during the 2015-2016 school

year to increase the number of students enrolling in colleges and those who will go on to complete a degree (ODHE, 2018). The emphasis from an economic perspective is that not only will the students earn more through STEM training, but so will the students' communities. This will be achieved through the students' greater community-based influences via service activities as well as broader direct contributions to economic growth within those same communities (Tyack, 2003).

College access is not a genuine pathway to potential success if it does not lead to a certification or a degree. There are growing concerns about educational attainment and degree completion (Regina Deil-Amen, 2012). Government officials and industry leaders are looking for ways to address workforce and employment issues to bridge high school to workforce transitions (Bailey & Karp, 2003).

High school reform has been the focus of both political and educational reform because of the increasing demand for a skilled workforce (Bragg et al., 2005). Autor (2014) notes the rising demand for educated labor and states that those with formal education will earn more over a lifetime. The United States ranks 17th internationally with career-focused associate degree programs at 10%, whereas, comparatively, Canada boasts 25% (Carnevale et al., 2013).

Policymakers have been focused on high school to college transitions for STEM careers, supporting workers with a four-year college degree, overlooking half of the STEM jobs available to workers without a 4-year degree (Rothwell, 2013). Of the $4.3 billion the Federal government spends on STEM training, one-fifth is invested in a certificate or associate degree education; a potential workforce of individuals with less than a four-year degree is being overlooked and underfunded (Rothwell, 2013). The need to access the allocation of funding to incorporate two-year degrees and certification beyond high school is instrumental in the future of the United

States economy. Investing in the individual on the front end of the postsecondary education process allows youth to obtain the necessary skills needed to directly enter the workforce with marketable and employable skill set. In contrast, if the investment is not made the result will be displaced workers with no employable skill sets in a knowledge-based economy.

2.3 Environmental Science

2.3.1 Academic Achievement

The reviewed literature consistently highlighted the positive impact of environmental education on students' critical thinking and problem-solving abilities. Research has found that integrating environmental science concepts into the curriculum improved students' critical thinking and problem-solving skills, resulting in higher academic performance across subjects (Blatt, 2013). The most noteworthy piece from Blatt's (2013) study was the potential of environmental education to foster critical thinking and engagement among students who may initially be resistant and dislike school. Ardoina et al.'s (2018) comprehensive literature review on K-12 environmental education demonstrated a significant positive impact, with 98% of studies indicating that students gained knowledge from environmental education. They emphasized the development of academic competency essential for the knowledge-based economy of the 21st century, encompassing critical thinking, analytical abilities, and higher-order thinking. Barnett et al. (2011) noted high school students participating in an ecology-focused program exhibited increased self-confidence in investigating and solving local environmental problems. This result underscores the positive impact of environmental education on students' critical thinking and problem-solving skills.

Ardoina et al.'s (2018) two-year study involving high school students in Florida observed that students who engaged in environmental education programs demonstrated noteworthy

improvements in critical thinking skills. Even after controlling for factors such as GPA, gender, ethnicity, and socioeconomic status, these students exhibited significantly higher scores in critical thinking measures and showed a greater inclination to apply these skills in the future. The analysis conducted by Stanford revealed a broad range of advantages associated with environmental education (Ardoina et al., 2018). Dozens of peer-reviewed studies demonstrated its positive impact on academics, making it a versatile approach because of students' inherent curiosity about the environment; thus, environmental education can be an effective tool. These studies documented students' knowledge gained in various areas, including the environment, mathematics, chemistry, biology, ecology, and more. Furthermore, the students indicated they enjoyed taking part in environmental education activities, which contributed to the overall positive educational experience.

A study by Bartosh et al. (2006) found that environmental education had a positive influence on students' performance on standardized tests. This may be attributed to the pedagogical nature of environmental education, which requires students to apply knowledge and skills from various subjects. Integration of math, science, language arts, and social sciences fosters a multifaceted approach to problem-solving and critical thinking. However, further investigation is needed to understand the specific factors influencing test scores and the practices that make a difference. Bartosh et al. (2006) study showed that schools with environmental education programs consistently outperform traditional schools on state standardized tests. Environmental education not only enhances environmental knowledge and attitudes but also serves as an engaging and empowering experience for learners. It furthermore emphasized the importance of integrating environmental education to enhance overall educational outcomes, but it also recognizes that other factors beyond environmental education contribute to student achievement. This

information provided compelling evidence of the influence of environmental education's impact on student achievement, ultimately contributing to a deeper understanding of how environmental education can improve educational outcomes.

In a study conducted by Ardoina et al. (2018), students who participated in environmental science programs showed an increase in their studies and improved overall academic motivation. The association between environmental education and increased motivation to learn are highlighted and students who participate in environmental science programs exhibit enthusiasm and interest in school, fostering a positive learning environment. Additional trends reported in the study were that 90% of the participants reported increased skills, 86% reported positive changes, and 83% reported enhanced environment-related behaviors. These trends demonstrate the positive impact on learning.

2.3.2 Experiential Environmental Activities

According to Schneller et al. (2015), students who engaged in hands-on environmental science activities demonstrated a better understanding of scientific concepts, leading to improved grades. The study took place at a middle school in upstate New York. Participating students showed significant improvement in their final exam scores compared to their peers who did not take part in the program. The hands-on nature of the course, coupled with an emphasis on sustainable practices, enhanced students' understanding of complex environmental systems, providing them with valuable practical skills. Teachers observed increased knowledge retention and critical thinking skills among the participants, regardless of their learning abilities.

Furthermore, several students in the study had learning disabilities, and their parents reported that the experiential and interdisciplinary lessons were more effective for their student's learning styles. The investigation further shows that the program improved academic

performance and nurtured pro-environmental behaviors among students, such as composting and purchasing local foods. These positive changes demonstrate the potential of environmental education in shaping future environmental advocates and stewards.

The studies conducted by Ernst and Monroe (2004) focused on a large-scale environmental education program administered to 400 secondary students in 11 Florida high schools. The program positively impacted students' skill improvements, regardless of their initial skill levels, academic achievements, or demographic backgrounds. The participating schools and students were selected from diverse geographical locations representing various socioeconomic statuses. The results of the study showed that 15-year-old students demonstrated critical thinking skills comparable to or exceeding those of college students in American universities. In the same study, teachers identified that the program helped to equalize each students' individual skills and strengths. The interdisciplinary and integrative nature of the environmental education approach was praised for improving critical thinking and fostering students' sense of responsibility for their own learning (Ernst and Monroe, 2004). The program demonstrated that environmental education can be a powerful tool for enhancing students' skills and promoting equitable learning opportunities.

McMillan et al. (2004) and McMillan (2003) found that environmental studies classes positively influenced students' academic achievement. Engaging in real-world environmental issues enhanced students' critical thinking, problem-solving, and research skills. Environmental studies provide opportunities to integrate various disciplines, leading to a more holistic understanding of subjects and improving overall academic performance. Ardoina et al.'s (2018) also provided evidence that environmental studies yield knowledge gains across multiple disciplines, including environmental issues, science, and mathematics. All three studies

demonstrated that environmental science education fosters interdisciplinary learning, enabling students to connect knowledge from different subjects, leading to better academic outcomes.

2.3.2 Environmental Stewardship

Environmental science plays a pivotal role in nurturing environmental stewardship and responsible behavior among students. Gerstenberger et al. (2004) reported that students exposed to environmental science education, develop a deeper appreciation for nature and a heightened sense of responsibility towards environmental conservation. The study revealed that students who completed an introductory environmental science course showed increased awareness of environmental issues and a more positive view of their personal impact on the environment. This suggested that environmental education can contribute to a greater sense of environmental responsibility. Ahamad and Tanin (2021) also found a correlation between college-level science course enrollment and an individual's pro-environmental attitude toward environmental pollution concerns. These findings have implications for U.S. national policy in improving pro-environmental attitudes and behaviors.

The studies conducted by McMillan and her colleagues explore the impact of university-level environmental studies classes on students' values (McMillan et al., 2004; McMillan, 2003). They found that students who participated in the environmental course exhibited positive changes in their stewardship values, showing increased pro-environmental attitudes and behaviors. The research highlights the important role in cultivating a generation of environmentally conscious individuals who understand the significance of sustainable practices and the preservation of natural resources. The results of the studies show this by integrating environmental education into the university setting as a way of imparting environmental values to students. As students gain a deeper understanding of complex ecological challenges, they

become equipped with knowledge and skills to address these issues (McMillan et al., 2004; McMillan, 2003). Hence in order to create a more sustainable society, it is vital to build environmental values in the coming generations. These studies shows that introductory environmental studies courses, in general, can contribute toward developing the connection and interdependence of humans with their environment. Unfortunately, the data suggests that courses such as these appeal to those least in need of all; therefore, the students or those most in need of teaching may never take a class.

In a study by Blatt (2013), students who participated in environmental science programs demonstrated greater awareness of environmental issues and expressed a stronger commitment to sustainable practices. The result indicates that environmental education goes beyond traditional classroom learning. The research explored environmental identity and behavioral change, revealing that students with a strong environmental identity were more likely to engage in pro-environmental behaviors. Blatt (2013) emphasizes the role of personal connections with the environment in driving positive actions. This heightened awareness led to a greater sense of responsibility and participation in conservation efforts. These findings underscore the significance of environmental education in raising awareness and promoting identity.

Evidence from research on lecture-based environmental education at the college-level suggests that it may be an effective way to influence students' environmental behaviors and willingness to make positive changes in the future. Gerstenberger et al.’s (2004) research supported these findings through a post-course survey that indicated students’ willingness to accept $100/year increases and family expenses if it contributed to promoting the wise use of natural resources. Additionally, immersing students in nature allows them to develop a personal connection with the environment, generating a sense of stewardship and identity towards the

ecosystems they encounter. This approach prepares students to address real-world environmental challenges by considering multiple perspectives, including scientific, social, and economic facets.

Ardoina et al.”s (2018) research found that environmental science education promotes a sense of environmental citizenship, empowering students to actively participate in local environmental initiatives and advocate for positive environmental change, including feelings of civic responsibility. The articles included in Ardoina et al. (2018) studies found environmental education to have positive civic outcomes. Students demonstrated a heightened sense of personal accountability and motivation to tackle community and environmental concerns. Moreover, it fostered emotional and social skills, including self-esteem, character development, team work, and leadership skills.

Environmental science courses have been shown to significantly contribute to strengthening communities, as demonstrated by the research conducted by Gerstenberger et al. (2004). These courses instilled a heightened sense of environmental responsibility, which led to more active involvement in community projects and initiatives. Through increased awareness of environmental issues, students became advocates for sustainable practices, leading to positive changes within their communities. The incorporation of environmental values into the University curriculum has a lasting impact, as students internalize these values and allow them to shape their decision-making processes in both their personal and professional lives. The ripple effect creates a more environmentally conscious society, contributing to efforts of environmental sustainability.

Hiller and Kitsantas (2014) conducted a citizen science program that involved students in fieldwork and data collection, leading to increased motivation in science through the

incorporation of educational beliefs regarding science that nurtured creativity, collaboration, unique problem-solving, and active engagement. Similarly, Volk and Cheak (2003) implemented an educational program for students in Hawaii, encouraging them to address local environmental challenges. The students demonstrated commitment to environmental stewardship by testifying to state legislators, showcasing their commitment to environmental stewardship. The program's impact extended beyond the environment, as students developed a belief in their ability to affect change in their communities. Additionally, parents and teachers praised the program for nurturing leadership skills, purpose, and autonomy, and a sense of environmental stewardship. Likewise, Kuo and Jackson (2014) demonstrated the viral role environmental studies courses played in fostering environmental stewardship among high school students. These courses inspired a sense of responsibility for their surroundings by connecting students to local environmental issues. The values of environmental stewardship cultivated in such classes translated into tangible actions, such as participation in community clean-up efforts and advocacy for sustainability initiatives.

Environmental education plays a vital role in promoting environmental stewardship and instilling a sense of responsibility toward the natural world (Ardoina et al., 2018). By engaging learners in real-world conservation efforts, environmental education empowers them to recognize their agency and influence in environmental science. These experiences serve as powerful motivators for learners to proactively address ecological issues, actively contribute to conservation initiatives, and ultimately evolve into committed environmental stewards. Moreover, environmental education installs a deeper appreciation for the environment and encourages individuals to take action at the level, thereby embodying the concept of "think globally by acting locally" (Clayburn et al., 2017). As environmental education becomes

increasingly integrated into educational programs, it equips individuals with the knowledge, skills, and motivation to make a positive difference in environmental conservation.

Ballard et al.'s (2017) research on selecting and utilizing citizen science programs has shown a positive impact on learners' environmental science agency. Students who participate in real and complex scientific efforts perceive their contributions as meaningful and impactful. Such experiences foster a sense of legitimacy and value, motivating students to actively engage in conservation efforts. By involving students in local communities' ecological issues in hands-on approaches, learners recognize their collective power in contributing to conservation efforts. These experiences not only enrich their knowledge and skills in environmental science but also shape their roles and actions as environmental stewards, laying a strong foundation for future conservation efforts.

Furthermore, Kuo and Jackson (2014) explored the influence of an environmental science course on students' attitudes, particularly regarding pursuing careers in environmental fields. After completing the course, the study showed a significant positive shift in the students' attitudes toward the environment. However, students maintained their perspectives regarding human dominance over the environment and their belief that human ingenuity could surmount resource limits. While engineering majors showed weaker endorsement initially compared to non-engineering majors, the increase in their endorsement after the course was statistically significant. This suggests that introducing environmental education into technical disciplines can lead to more environmentally conscious engineers and professionals.

Summary

Higher education is needed to prepare the future workforce, and the Federal government has stressed the need to continue to increase STEM degrees. The United States relies on its

STEM workforce to remain competitive in the international market. The STEM workforce provides an avenue for workforce innovation and inspires advances in science. As such, education will become increasingly crucial to the United States economy.

The Ohio CCP program continues to mature, with students successfully graduating from postsecondary education and entering the workforce. Efforts to enhance the program's effectiveness are ongoing through collecting, tracking, and monitoring relevant data, which would inform future improvements. However, the new implementation of the CCP program has led to a scarcity of data, posing a challenge in evaluating the program's overall effectiveness. To assess the CCP policy's potential to achieve its intended program goals, researchers and policymakers rely on existing research and literature. The specific data sets collected by Ohio are based on research that gauges the effectiveness of dual enrollment programs. Policymakers and affected stakeholders must gain a comprehensive understanding of whether the program meets the needs of the students and employers.

The importance of efficiency and supporting the communities that understand the job market demands are paramount to the individualistic culture in Ohio. The importance of analyzing the CCP policy for efficiency is similar to the need for process improvement and getting the most out of the investment of resources to ensure fiscal accountability. The major challenge is that dual enrollment students do not fit into established reporting, mainly because they were self-selected. Research has confirmed that dual enrollment contributes to education attainment; thus, it is well worth the time spent to understand the implications of dual enrollment on filling the workforce gap in the STEM field (Fure, n.d.).

Literature has uncovered that students' self-efficacy directly impacts their learning experience by strengthening their belief in their potential to succeed. A student's social identity

and self-concept influence their decisions during the crucial years of adolescence. The career choice process can cause a shift in self-efficacy views. For example, high school students who take dual enrollment courses experience a beneficial effect on college access and, as a result, increased degree completion. The influence of the parents on high school students' aspirations and transformations is established to directly relate to the students' career aspirations.

Research has consistently shown that students tend to excel and engage more in subjects they are passionate about (An, 2015; Kanny, 2015; Kemple & Snipes, 2000; Smith et al., 2007). By understanding how to tailor dual enrollment courses to align with their interests, educators can foster higher levels of enthusiasm, leading to enhanced levels of academic achievement. Educators can design educational programs that resonate with their passions and aspirations by emphasizing understanding students' course selections and interests. This approach will contribute significantly to creating a more engaged and prepared future workforce, equipped with the knowledge and skills needed to thrive in environmental and STEM-related careers.

The dual enrollment program presents a conundrum of offering both intrinsic and extrinsic rewards. A gap in the literature exists in regard to why adolescents make the decision to select dual enrollment. Developing an understanding of a student's decision to participate in a dual enrollment environmental science course while in high school will fill a gap in the literature. Connecting reform efforts to student dual enrollment participation is essential in understanding the foundational intentions of equity and economic success of dual enrollment programs. In turn, this may help bridge the gap in STEM skills within the United States.

Chapter III. Methodology

Ensuring educational equity in STEM through learning opportunities and enrollment patterns is crucial for long-term learning trajectories and postsecondary education major choices (U.S. Department of Education, 2022, December 7; National Academies of Science, Engineering, and Medicine, 2020). State policies have historically focused on funding, accountability, high school-to-college transitions and partnerships, but the effectiveness of dual enrollment as a popular educational reform model is still being debated due to limited empirical data (Harnish & Lynch, 2005; McLendon & Perna, 2014; Barshay, 2013; An et al., 2019). A divide continues to exist between secondary and postsecondary experiences, and students are left without clear expectations of what defines success with regard to the academic expectations placed on them when transitioning into postsecondary education (Karp, 2007; An, 2013a).

Self-efficacy, social identity, and self-concept are crucial factors that impact students' learning experiences and career aspirations (Bandura, 1997; Lent et al., 1994; Ryan & Deci, 2000b; Ryan & Deci, 2017). A dual enrollment program offers intrinsic and extrinsic rewards, and research is needed to understand the factors motivating students to participate in these programs. Zinth and Barnett (2018) argue that the stated misunderstandings of dual enrollment have limited participation, and Ohio's policy culture of competition among postsecondary institutions has created ill-defined processes and discouraged collaboration (An & Taylor, 2019). Students are often unsure about the expectations and definitions of success in transitioning from high school to postsecondary education, and the focus on dual enrollment as a vital career and workforce development tool needs more research (Karp, 2007; Ali & Saunders, 2009; An, 2013a; Bailey & Karp, 2003; Grubb, 2015; Kimi, 2014). Research on student selection for dual

enrollment is necessary, as eligibility is determined by state policies, and understanding the motivations behind participation can inform interventions and policies.

Investing in STEM education is crucial for short-term innovation and long-term preparedness, particularly for those from low-income backgrounds (Mehl et al., 2020). Strengthening STEM skills can lead to careers in renewable energy and emerging technologies, which can help address environmental sustainability practices (U.S. Department of Education, 2022, December 7). The impact of college environmental science courses has shown that students can develop stronger environmental values, which in turn can increase their awareness and open new career opportunities for them (McMillan, 2003; McMillan et al., 2004). In Ohio, implementing dual enrollment policies has the potential to reduce the educational gaps and increase access to higher education, thereby benefiting both individuals and supporting communities (An & Taylor, 2019). However, in order to ensure that these policies are effective and equitable, it is necessary to analyze their efficiency and connect reform efforts to student participation. Doing so will be essential for promoting both equity and economic success and Ohio's diverse culture.

The purpose of this study is to fill a gap in the literature by examining the factors that motivate and influence high school students' decision to participate in a high school-based dual enrollment environmental science course. The study aims to understand the students' self-reported reasons for engaging in academic behavior, enabling them to build on interests and passions, and to identify the values they see in the course for their life and future application of subject material. This research contributes to understanding the foundational intentions of equity and economic success of dual enrollment programs. Motivational theories are used as the conceptual framework to assess the aspects of autonomy, interest, competence or self-worth, and

self-determination. The study used mixed-methods methodology, a vetted survey instrument, and a semi-structured focus group interview, to gather data and analyze merging themes from students' insights. By connecting reform efforts to student dual enrollment participation, the study contributed to the development of interventions and policies that promote equity in education strategies through STEM courses and decrease educational gaps while increasing access to higher education.

Research Questions

1. What self-determined interests motivated high school students' decision to participate in a College Credit Plus Environmental and Society course?
2. How do the factors influencing the College Credit Plus Environmental and Society students compare to those influencing the typical dual enrollment student decision to participate in dual enrollment?
3. What value do students perceive in participation in a College Credit Plus Environmental and Society course?

Research Design

The objective of this mixed methods study is to investigate the significance and appeal of dual enrollment programs among high school students. The research intends to analyze the motivating factors and influences that shape the decision-making process of high school students regarding their participation in a dual enrollment environmental science course. The study aims to reveal the self-reported rationales behind the students' academic conduct and encourage them to cultivate their interests and enthusiasm. Additionally, it aims to identify the values that the students associate with the course, both in terms of their current academic pursuits and their

future application of the subject matter. Both quantitative and quantitative techniques were employed to collect data.

One survey, which consisted of the AIR Self-Determination Scale (SDS) and demographic data, was used as a quantitative survey to measure students' self-determination and basic student characteristics. The SDS is a reliable and valid tool for measuring self-determination among individuals with disabilities and has been found to be effective in measuring self-determination among other populations as well. The SDS consists of 24 items, each rated on a five-point Likert scale, and assessed the students' self-determination in four domains of self-determination: goal-setting, decision-making, problem-solving, and self-advocacy. The survey was administered to all participants in the study.

The qualitative methods employed in this study encompassed focus group interviews, and document collection. The focus group approach provided an opportunity for students to discuss their experiences and interpretations of their world and helped the researcher gain a deeper understanding of their experiences. The focus group interviews was conducted with a group of dual enrollment students currently enrolled in a course. The researcher facilitated the focus group discussions, encouraging students to share their experiences and perspectives. The documentation was collected independently of the interviews.

Participants & Sampling Technique

This study utilized purposeful sampling, although the sample used in this study may also be considered a convenience sample. The participants were high school students enrolled in an environmental science course for college credit through the CCP program at the University of Findlay during the 2023-2024 school year. The sampling technique used in this study was purposeful sampling, which involves selecting participants based on specific criteria relevant to

the research questions. The use of purposeful sampling for this study allowed the researcher to select participants who can provide the necessary data to answer the research questions. As per Merriam (1998), purposeful sampling is useful when the investigator wants to gain insight and understanding into a particular phenomenon or group of individuals. The researcher obtained the names of the participating high schools from the Assistant Director of CCP at the academic affiliate college, University of Findlay, and then contacted the high school principal to inquire about their willingness to participate in the study. The participants were then selected based on their dual enrollment status of participating in an environmental course that offers a lab component to complement the course during the 2023-2024 school year at their high school campus through University of Findlay and their willingness to voluntarily participate in the study.

Ethical Considerations

A common goal of qualitative research is to understand real-life phenomena, explore effective approaches, observe behavior, and improve lives in other ways. Balancing our desire to learn and the rights of those we observe can be a precarious act. "We cannot focus only on the quality of the knowledge we are producing, as if its truth were all that counts. We must also consider the potential "wrongness" of our actions as qualitative researchers in relation to the people whose lives we are studying, our colleagues, and those who sponsor our work" (Miles et al., 2020, p. 49). In this study, the researcher identified potential ethical concerns that could arise from data collection, data storage, data analysis and the research site. Ethical considerations were identified based on the students, the high school/school district, and the partnering university in which data collection, data storage, data analysis, and research site could pose potential ethical concerns for the researcher.

Data collection consisted of a survey, focus group interviews and documentation collection. The SDS portion of the survey was originally developed and validated with a predominately White, middle-class sample. Therefore, its use with individuals from diverse cultural backgrounds may raise concerns about the applicability of full attention biases in the assessment. Meanwhile, demographic surveys are a common tool used to collect data on a population's characteristics (e.g., education, income) and are generally considered to be a low-risk form of research (NIH, 2018). Allowing the face-to-face interaction with students to remain in their natural environment where they are familiar and comfortable, participants had the opportunity to provide their perspectives in the same setting where they experienced the phenomenon and where it is familiar enough to offset any feelings of isolation or conflict (Saldaña, 2013).

Sieber (1992) describes confidentiality as an agreement with individuals about what can be done with their data. Participants share and describe in-depth and private details about their experiences, which the researcher has an ethical responsibility to keep confidential (Creswell, 2013). To ensure data privacy and confidentiality, the researcher password-protected all data collected from the study, including focus group interviews, surveys, and documentation, and stored it in a locked cabinet. Additionally, pseudonyms were used to maintain the participants' privacy, and no identifying information was disclosed. National Institutes of Health (2018) suggests that transcripts, audio files, and informed consent documents will be held for three years and destroyed afterward. The data will be deleted from the password-protected computer, and any physical data, such as paper records, will be shredded to ensure data cannot be reconstructed.

The data analysis process employed triangulation as a validation strategy by converging information from different data collection methods, such as focus group interviews, a survey and

documentation, to minimize researcher bias and add credibility to the research. An analysis that triangulates results combined from different data collection methods enhances validity, provides a more in-depth picture of a research problem, and explores different approaches to understanding it (Flick, 2004). However, it is crucial to ensure the trustworthiness of the data, as emphasized by Polkinghorne (2005), who highlights the role of research integrity and honesty. When a researcher has been left to interpret the voice of the participants, there is a question of researcher bias. No identifying information was disclosed about the participants, and pseudonyms were used to maintain the participants' privacy. By converging information from focus group interviews and documentation, researcher bias was minimized, and credibility was added to the research (Patton, 2002; Polit & Beck, 2012).

The research site's confidentiality was maintained to avoid any negative consequences that may arise from the study's results. No identifying information about the high school will be disclosed. Despite the possibility of negative reception, an honest evaluation of the research in a pursuit to understand and support meaningful experiences for all students should include understanding what works in a program and where there is room for improvement, even if it reflects negatively on the dual enrollment course.

Lastly, consent was obtained from each participant's parents, as well as from participants who were 18 years and older. Additionally, written permission was obtained from the school site to conduct research on-site. Data collection using semi-structured focus group interviews required the participants to share sensitive and personal information. Thus, it was vital to ensure that participants were aware of their rights and that their privacy and confidentiality were protected. The process ensured that participants were aware of the study's purpose, what their involvement entailed, and the implications of their participation.

Instrumentation & Data Sources

In this study, multiple data sources were used to confirm and validate the data collected. The researcher used one survey instrument to collect participant demographic information and the AIR Self-Determination Scale (SDS) information (see Attachment C), focus group interviews, and documentation as instruments to align with the research questions and provide evidence validation. Yin (2018) explained that collecting high-quality research data has no clear stopping point; however, when evidence from two or more sources was cited and there was an attempt to support counterarguments, the data could be considered a confirmation of the data collected. In an effort to meet the established criteria, the study drew upon data collected through various sources, such as interviews, and documentation (including transcripts). These diverse data sources provided valuable evidence validation and facilitated aligning the research instruments with the participants and setting, thereby informing the research question (Roberts & Hyatt, 2018). The following sections describe each instrument and data source used in this study.

Survey

A survey instrument was used to collect data from the participants: the AIR Self-Determination Scale (SDS) and demographic questions. The survey was distributed in the form of a questionnaire and was used to collect basic characteristic information of the participants, the information was used to gain a better understanding of the population being studied, consisting of 17 close-ended questions. Krosnik and Presser (2010) state that demographic questions are typically asked in a survey to establish rapport between the researcher and the participants. Respondents may be more likely to answer other questions if they feel comfortable with the interviewer. Additionally, asking demographic questions helps

to ensure that the subject is eligible to participate in the study and that the appropriate sampling procedures have been followed. The questions in the demographic portion of the survey instrument were based on previous research on dual enrollment high school student populations. These questions covered various aspects, including gender, ethnicity, socioeconomic status, the highest parental degree, plans after high school, grade point average (GPA), post-high school plans, and CCP background (including college credits earned and subjects taken), and factors influencing their participation in dual enrollment. The relevant sources informing these questions included works by Allen (2010), Ali & Saunders (2009), Kennedy (2008), Salerno (2011), and Taylor et al. (2022). The information constructs influence the decision to enroll in CCP and environmental science course (RQ1) and a snapshot of pre-college experience (RQ2).

The AIR Self-Determination Scale (SDS) is a tool used in research to assess an individual's level of self-determination, which refers to their ability to control their own lives. The scale was based on Mithaug's (1993) self-regulation theory. The SDS portion of the survey instrument was used to collect data on various factors related to self-determination, including goal-setting, decision-making, problem-solving, and self-regulation. These are important elements to help to understand self-determination because of the relationship between capacities and opportunities and the development of basic self-determination skills (Wolman et al., 1994). The SDS is a self-reporting survey, where participants complete the survey themselves, creating a motivational profile that allows for the assessment of self-determination. The pursuit of challenges that align with an individual's capacity (i.e., their knowledge, abilities, and perceptions) and the opportunities available in their environment can facilitate the development of self-determination. The AIR SDS consists of 24 statements rated

on a five-point Likert scale, ranging from never to always, with subscales for Capacity and Opportunity consisting of six items each that relate to basic self-determination skills such as identifying strengths and weaknesses, setting goals, planning for goal attainment, self-management, and self-regulation. The Capacity subscale includes two indexes: "Things I Do" and "How I Feel," which ask about self-determined behavior and the students' feelings when performing these self-determined behaviors. The Opportunity subscale also includes two indexes: students' perceptions of opportunities for self-determined behavior at school and home. While the AIR SDS is useful for assessing self-determination in students, it is important to note that it is not a normative scale and cannot be used for diagnostic or predictive purposes.

The AIR SDS survey is a mixed-method design. The survey has three prompt questions to gather data on students' personal goals and progress toward achieving them. The data is valuable in attaining information on self-determination. By asking students to provide an example of a goal they are working on, the researcher can gain insight into what types of goals are important to them and what they hope to achieve. This helped contextualize the data and provide a deeper understanding of the students' motivations. The second question, "What are you doing to reach this goal?" can provide information about the strategies and actions students use to work toward their goals, identify common approaches or barriers students have or face and help identify strategies for support. Third, "How well are you doing in reaching this goal?" allows students to subjectively identify their progress toward their goals and where they feel they are progressing, struggling, or need support. The qualitative data aims to capture information on the students' goal-setting process, their actions toward achieving a goal, and their perception of progress.

The survey was administered in a paper format during a scheduled class period, and standard procedures were followed to ensure the survey results were reliable and valid. This included using the same instructions and questions for all participants, providing clear and detailed instructions on how to fill out the survey, and providing an example question and answer. The survey was intended to address (RQ1) and (RQ2) and was administered in the environmental science classroom.

Interview

To ensure the credibility of the interview questions, the researcher piloted them prior to the actual study. This piloting phase involved reviewing and seeking feedback on interview questions to assess their ability to genuinely measure what they intend to measure. Additionally, the researcher evaluated factors such as understandable instructions, clear wording, adequate answers, sufficient information, length, and overall convenience for participants (Seidman, 2013). The questions were designed to be open-ended and general to support discussion and provide replies that would help offer insight into the study. Questions were developed using issues raised in the existing literature and further inquiry was conducted based on questions raised by the survey to gain clarity or ask for elaboration. Seidman (2013) explains that testing a research design allows a researcher to gauge their ability to conduct the study and accept the practicalities. Due to the study's small population size of ten CCP students and four non-CCP students, it was not possible to conduct a pilot study with the exact population being researched. Therefore, a similar population with similar characteristics and experiences was used to test the validity and reliability of the research instrument and method before the actual study. However, it is important to know that this may limit the generalizability of the findings on the study population (Creswell & Clark, 2018; Seidman, 2013). The pilot study of the focus group

questions played a critical role in the data collection process, ensuring that the interview questions effectively captured the necessary data to address the research questions. Through this piloting study, the interview questions were refined and validated, resulting in a more comprehensive and accurate depiction of the students' experiences in the environmental science course.

This research focused on how persons understood and described their own purpose for acting and the relation of such purposes to a continuum of autonomy. People ordinarily account for their own actions with reasons. Based on dual enrollment students' self-reported reasons for engaging in typical academic behavior and allowing them to explain their actions, they could state their self-determined goals or purpose for doing something and the value they derived from an experience. By conducting a focus group interviews with students enrolled in a dual enrollment course, the researcher attempted to understand how students interpret their experience, construct their world, and attribute meaning to their experience (Merriam, 2009). The focus group interviews were conducted "to uncover the meaning structures that participants use to organize their experiences and make sense of the world" (Hatch, 2002, p. 91).

A focus group approach was intended to provide an atmosphere where students felt comfortable sharing their experiences, would stimulate additional conversation, and provide a deeper understanding of student experiences. The focus group format enabled the taken-for-granted assumptions to be brought to light and the similarities and differences to be explored. The focus groups provide a space where participants could interact with one another, generate ideas, conversations, and build upon each other's responses. The approach generated rich data as it captured the nuanced interactions between participants and allowed for a deeper understanding of social and cultural factors that influenced their experiences. This led to a deeper exploration of

the research topic as well as providing an opportunity for participants to clarify their thoughts and opinions. The first session consisted of six students both CCP and non-CCP, and the second session consisted of four CCP students who agreed to participate in the focus group in the environmental course classroom. Merriam (2009) explains the importance of purposeful sampling in qualitative studies, where participants are selected based on their ability to provide rich and diverse information relevant to the research question. The focus is on selecting participants who can contribute unique perspectives and experiences. The session lasted 40 minutes during traditional class time and was digitally recorded and transcribed as soon as possible.

The purpose of using focus group interviews as an instrument is multifaceted. It provided an opportunity to collect in-depth information about the experiences and perspectives of the students to understand the unique challenges and opportunities associated with dual enrollment environmental science courses. Additionally, identifying common themes or patterns in the experiences and perspectives of the students developed a deeper understanding of the factors that influence student success in these courses. Finally, validating and corroborating the findings from other sources of data and understanding the perspectives of students on their academic behaviors and the value they derive from the experience.

Documents

In order to enrich the description of each student's experience with dual enrollment, their educational journey, how the characteristics and experiences compare to those of other dual enrollment students, and the factors influencing the participation in the environmental science course, permission to access contextual information from students was requested. Access to unofficial student transcripts was requested to gain a more comprehensive understanding of each

student's experience with dual enrollment and their educational journey. The researcher requested permission to access contextual information from the students and their parents to attain an unbiased picture of the student's academic history, including the successes and challenges. By coupling this information with data obtained from interviews and other collected documents, the researcher aimed to gain a better understanding of how students qualified for CCP and what factors influenced their decision-making process. In Ohio, there are specific criteria that students must meet in order to demonstrate readiness for the CCP, such as obtaining a quality score on a standardized test like the ACT or SAT or taking a placement test like the Accuplacer assessment (ODHE, 2023).

Access to the course description and syllabus, demographic information about the students, and institutional data on student success rates in the dual enrollment course were requested to gain insight into the academic experiences of the students. Coupling information from interviews and collected documents provided a picture of how the student qualified for CCP and a glimpse into their self-selection decision-making process. This approach painted a clearer and more complete picture of these students, allowing for meaningful comparisons to be made with other students participating in the dual enrollment programs. The data aided in answering research questions about who these students are and how they compare to other students participating in dual enrollment. The documentation was collected independently of the interviews to ensure the data obtained from each source was as unbiased and accurate as possible, helping the researcher understand how students were selected for the course.

Specifically, high school transcripts provided objective data on the academic background of the dual enrollment students in the environmental science course. Transcripts provided information about the courses taken, grades received, overall GPA, and other collected

documents, the researcher aimed to gain a better understanding of how students qualified for CCP and what factors influenced their decision-making process (U.S. Department of Education, 2023). GPA is used as a standardized measure of students' college readiness and areas such as English, Math, Reading, and Science. Using transcripts as documentation instruments established a comprehensive baseline of academic preparation, achievement, experience with dual enrollment courses, and the decision-making process for the students in the environmental science course. The information derived helped understand the students' academic backgrounds and potential challenges and was used to compare the performance of dual enrollment students and academic preparation.

The course syllabus was valuable in providing insight into the content and structure of the course. The outline of course objectives, topics, readings, assignments, and grading criteria provided a detailed description of the course content and expectations. Analyzing the syllabus gave the researcher a better understanding of the pedagogical approach and course design. Including the syllabus as a document in this study allows future researchers to compare courses across the different institutions or current schools in the study to track changes in course content over time for educational practice and outcomes. The data collection also helps to answer research questions about who these students are and how they compare to other students participating in dual enrollment. The documentation helped to address research questions (RQ2) and (RQ3).

Data Collection Procedures

The initial step in the data collection procedures for this research study was to obtain necessary approvals from the high school principal and the Institutional Review Board (IRB) of the researcher's university. An email was sent to the principal introducing the research request

proposal and requesting approval to conduct the study in their building. The email clearly outlined the purpose of the study and opened a conversation to obtain approval. Additionally, the school district superintendent was copied on the email correspondence with the principal to ensure they were aware of the research study. No incentives or compensation were offered to participants. In the case of participants who were not over 18 years old, the research process involved seeking specific consent from their parents or guardians. A consent form was provided to parents or guardians, outlining the research's purpose and the rights of the participants. Additionally, assent was directly sought from the students themselves to ensure their willingness to participate. Only after obtaining both parental consent and student assent did any data collection procedures commence.

The data collection process involved three methods: surveys, interviews, and document collection. The AIR self-determination scale and demographic combined survey were distributed by the course instructor during a typically conducted class session after the consent forms were attained. The course researcher introduced the SDS to the students, explaining its purpose and provided instructions on how to complete the survey. In Figure 2, the instructions for the SDS survey were presented at the top of every survey, allowing for students to read them independently themselves and also for the researcher to read them aloud.

Figure 2

SDS Survey Introduction and Instructions

HOW TO MARK YOUR ANSWERS

EXAMPLE QUESTION:
I check for errors after completing a project.
EXAMPLE ANSWER:
Circle the number of the answer which tells what you are most like:
(Circle **ONLY ONE** number).

1 Never……student never checks for errors.

2 Almost Never……student almost never checks for errors.

3 Sometimes…….student sometimes checks for errors.

4 Almost Always……..student almost always checks for errors.

5 Always……student always checks for errors.

REMEMBER
There are NO right or wrong answers.
This will not affect your grade. So please think about each question carefully before you circle your answer.

The students were informed that they would be presented with a series of statements and asked to rate on a sliding scale the extent to which they 'always' perform to 'never' perform a task in each statement, and three short answer responses would follow the 24 questions. The survey ended with 17 close-ended questions with predetermined answer choices, which took the students about 15-20 minutes. The students were then provided a printed paper copy. The surveys were collected and the researcher began analysis within two days of the survey.

The researcher conducted a pilot study of the focus group research questions to refine and validate the data collected from the previous sources. This process involved creating a set of semi-structured interview questions to guide the focus group interviews. The questions were developed based on the data acquired from previous sources, surveys and documentation. The focus group interviews was conducted with a similar but not identical group of CCP student population of various high schools of similar size to those in the study who were randomly selected and invited to participate voluntarily. The pretest of questions with this group was conducted due to the small sample size the study pulled from to identify any potential problems with the questions, such as ambiguity or difficulty in understanding.

Feedback from the pilot study was used to refine and improve the interview questions, making them more specific, clear, and relevant to the research questions. The focus group questions for the pilot survey design were structured around academic and career interests, with a focus on assessing any changes in these interests, particularly regarding the potential benefits of taking the environmental science course and interest in obtaining the CCP-OSHA Environmental certification. Additionally, the survey aimed to understand participants' perceptions of the value gained compared to their peers by participating in the course and their beliefs about its usefulness for their future career and educational pursuits. After compiling the data from the acquired sources, questions were created to guide the semi-structured interviews.

The data from the interviews were collected through an audio recording device by the researcher. The audio recording device was utilized to collect and document feedback from the participants to ensure accuracy by not relying on memory to record the data (Rubin & Rubin, 2005). The researcher transcribed the interviews as soon as possible after the interviews to

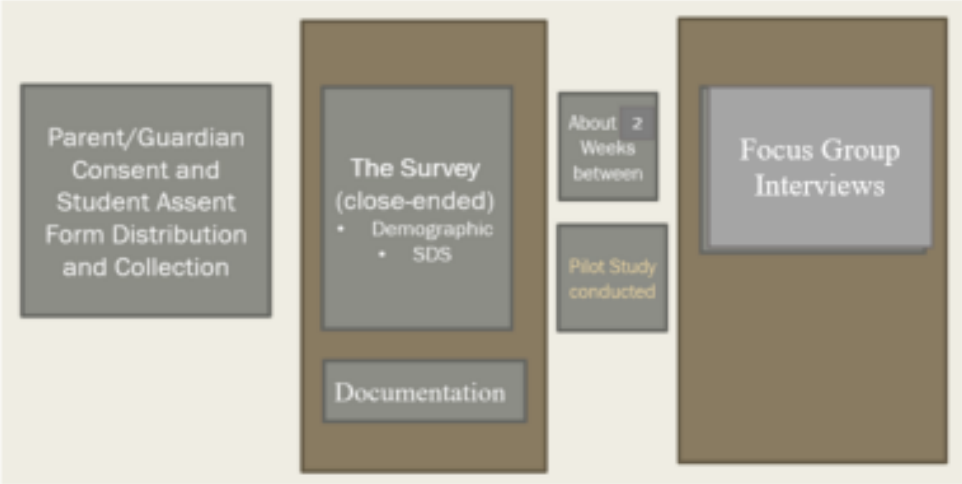
ensure the experiences of the interviewees were accurately reflected in the findings. Semi-structured focus group interviews were conducted in this study to obtain information to understand the students' self-reported reasons for engaging in academic behavior, enabling them to build on interests and passions and to identify the values they see in the course for their life and future application of subject material was crucial to answering the research questions. Merriam (1998) suggests using a semi-structured method in cases where it is necessary to explain "the emerging worldview of the respondent" (p. 74). The semi-structured interviews allowed for a flexible method where the line of questioning is controlled by the researcher, who could facilitate the discussion to follow up on interesting points during the interviews; the researcher can create a discussion to explore replies more deeply (Smith & Osborne, 2003; Smith et al., 2009). The focus group approach provided an atmosphere for students to share their experiences and prompt one another to their own experiences. For this study, the interview was developed with a sequence of broad questions as a starting point for a broader discussion with participants about the environmental course and their experience. Using this method, the researcher had a list of open-ended questions prepared ahead of time to guide the line of inquiry, which permited exploring similarities and differences in the students' attitudes and value of the course. Using open-ended questions prompted students to reflect on their decisions and reveal their experiences. Smith et al. (2009) note that asking questions in a manner to engage students in a conversation, allow them to reflect on their experience and uncover something meaningful about their experience. The absence of the course instructor during the focus group interviews created a safe space for students to express their feedback on the course and material without feeling judged or fear of potential consequences. The interview questions used for the study conducted can be found in Appendix D.

To obtain the students' unofficial transcripts, the researcher included a request for these documents in the consent form provided to the parents or guardians of participating students or the students themselves if they were over 18 years old. The consent form clearly outlined the purpose of the study and provided details about the data collection procedures, including the request for transcripts.

The documents acquired for source information were converted to electronic documents, allowing all information to be encrypted and secured. The collected documents helped the investigator answer research questions one and two, which sought to understand factors influencing the students participating in the CCP environmental science course and how these students' characteristics and experiences compare to those of other students' dual enrollment participants. The students' unofficial transcripts were requested in the consent to participate forms provided to the parents/guardians or students over 18 years of age. The consent form to participate was then presented to the participating high school administration office to attain the students' unofficial transcripts. After obtaining signed consent forms, the researcher contacted the participating high school administration office to request access to the students' unofficial transcripts. The administration office was provided with a copy of the signed consent form for each participating student to confirm their permission to release these documents. Once the administration office confirmed the students' consent to release their transcripts, the researcher was granted access to the requested documents. In order to maintain the confidentiality and security of the collected data, the documents were converted to electronic format and stored on a password-protected computer.

Figure 3

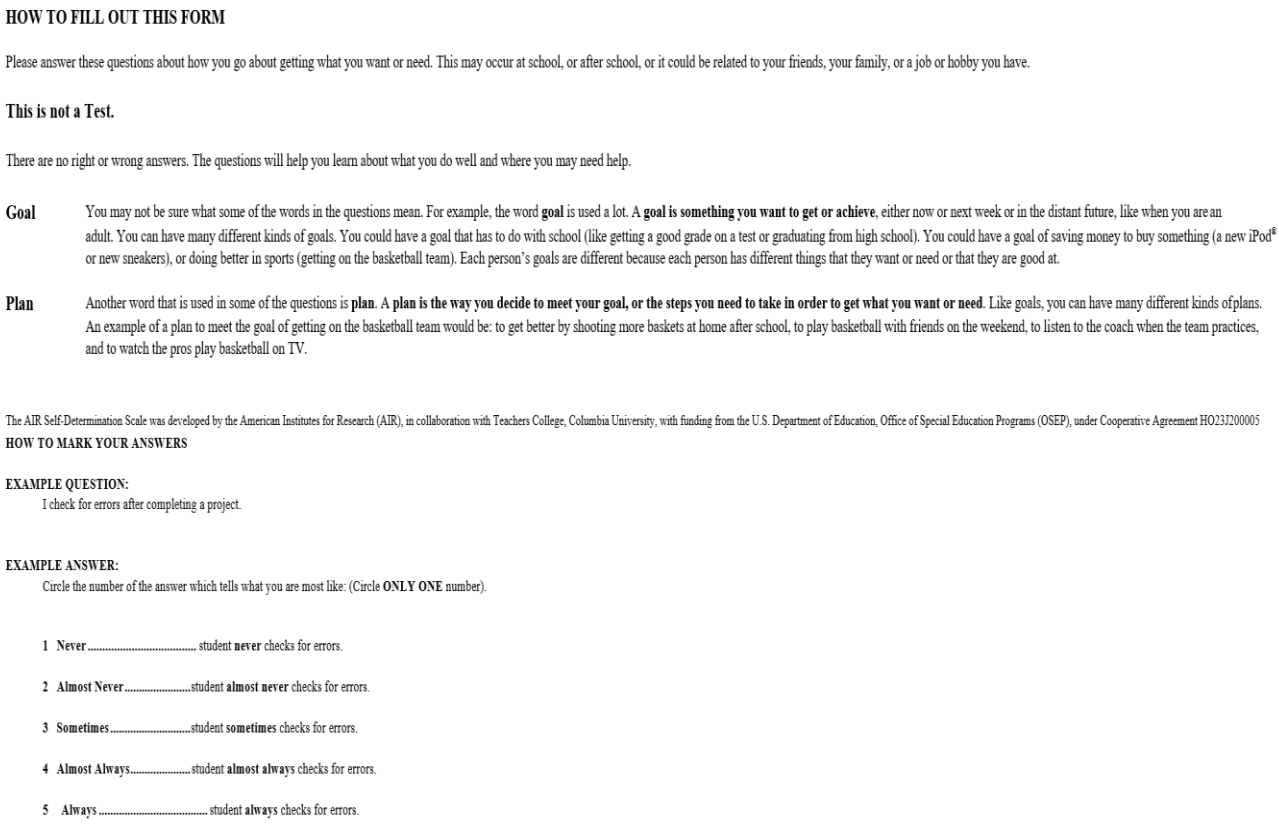
Data Collection Sequence Overview



The figure presented above (Figure 3) outlines the data collection sequence: 1) The researcher requested 15 minutes of the course instructor's class time to explain the study to the students. The consent/assent forms provided the outline for the researcher to ask the students to participate. 2) The survey instrument consisting of the AIR SDS and the demographic questions was administered to determine the motivational profile of the students. The survey was introduced to the participants after the consent/assent forms were returned. The researcher scheduled a time with the course instructor to conduct the survey. The students were provided a printed paper copy of the survey. The researcher explained the purpose of the study to the class and provided the students with oral instructions on how to complete the survey. The instructions were also written at the top of the survey in Appendix C and can be seen below (Figure 4). The AIR self-determination scale used consists of 24 sliding scale questions and three short answer questions.

Figure 4

SDS Instructions Overview



HOW TO FILL OUT THIS FORM

Please answer these questions about how you go about getting what you want or need. This may occur at school, or after school, or it could be related to your friends, your family, or a job or hobby you have.

This is not a Test.

There are no right or wrong answers. The questions will help you learn about what you do well and where you may need help.

Goal You may not be sure what some of the words in the questions mean. For example, the word **goal** is used a lot. A **goal is something you want to get or achieve**, either now or next week or in the distant future, like when you are an adult. You can have many different kinds of goals. You could have a goal that has to do with school (like getting a good grade on a test or graduating from high school). You could have a goal of saving money to buy something (a new iPod® or new sneakers), or doing better in sports (getting on the basketball team). Each person's goals are different because each person has different things that they want or need or that they are good at.

Plan Another word that is used in some of the questions is **plan**. A **plan is the way you decide to meet your goal, or the steps you need to take in order to get what you want or need**. Like goals, you can have many different kinds of plans. An example of a plan to meet the goal of getting on the basketball team would be: to get better by shooting more baskets at home after school, to play basketball with friends on the weekend, to listen to the coach when the team practices, and to watch the pros play basketball on TV.

The AIR Self-Determination Scale was developed by the American Institutes for Research (AIR), in collaboration with Teachers College, Columbia University, with funding from the U.S. Department of Education, Office of Special Education Programs (OSEP), under Cooperative Agreement HO23J200005

HOW TO MARK YOUR ANSWERS

EXAMPLE QUESTION:
I check for errors after completing a project.

EXAMPLE ANSWER:
Circle the number of the answer which tells what you are most like: (Circle **ONLY ONE** number).

1 **Never**..... student **never** checks for errors.

2 **Almost Never**.....student **almost never** checks for errors.

3 **Sometimes**.....student **sometimes** checks for errors.

4 **Almost Always**.....student **almost always** checks for errors.

5 **Always**..... student **always** checks for errors.

The 17 close-ended demographic questions in the survey contain a list of predetermined answer choices or options to obtain the student's perspectives on why they participated in an environmental science dual enrollment course. 3) Access to the documentation that qualified the student to participate in the dual enrollment course, i.e., the student's unofficial high school transcripts was requested for review during the consent/assent to participate in the study. The information was collected prior to the focus group interview. 4) After completing the survey, and documentation collection, the researcher piloted the semi-structured interview questions with a similar population. There were about two weeks between the pilot study and the focus group interviews. The semi-structured focus group interviews were conducted approximately two

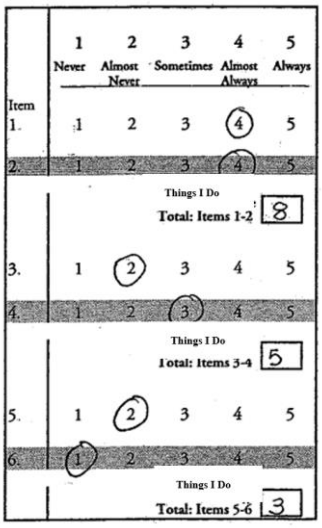
weeks after completing the surveys and documentation review. The interviews lasted between 35-45 minutes. 5) The surveys and interviews were all conducted on the high school campus during regularly scheduled environmental class time, which was prearranged with the course instructor.

Data Analysis

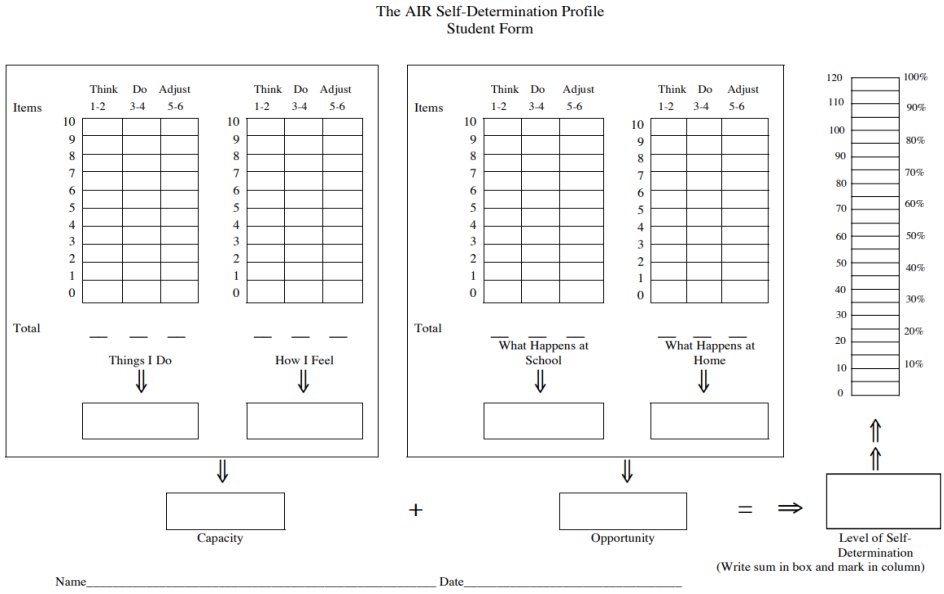
Quantitative Data

The AIR SDS was scored according to the provided scoring key for each student. Both domains have two sub-scales, each of which includes six items individually. All four sub-scales comprise three components: Thinking, Doing, and Adjusting. The scores for each subscale were added up, and their overall score was calculated. The scoring key was used to interpret the students' results. The SDS provided scores for three subscales (self-regulation, self-realization, and self-advocacy) and an overall score. The provided scoring sheet was used to interpret the participant's results.

1. For example, after the student finished the “Things I Do” portion of the self-determination scale, consisting of six items, they marked the six “Things I Do” items like this:



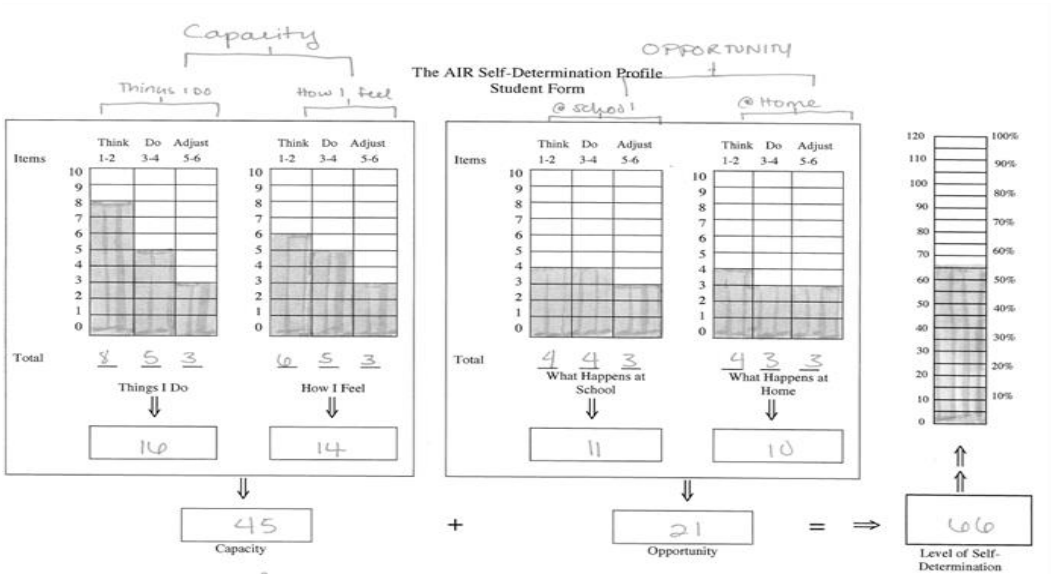
2. The responses to the questions of the six items in the “Things I Do” section were recorded on the Student Form provided for the SDS profile.



3. The responses to Items 1-6 of the “Things I Do” section labeled "Think" for 1-2 responses were added together.

   Responses for both questions one and two were Almost Always =4+4=8, and 8 was recorded in the box below item two. The same procedure used for Items 3-4 "Do" where the student selected Almost Never (2) and Sometimes (3), and a five would be entered below the "Do" section. For items 5-6, "Adjust" the Almost Never response (2) and Never response (1) would be placed below the "Adjust" section. Add together the scores for "Think," "Do," and "Adjust."

4. Similarly, the responses for items set for “How I Feel”, “What Happens at School”, and “What Happens at Home” were recorded on the profile sheet in the appropriate columns.
5. Next, the totals were added together for “Things I do” and “How I Feel” to fill in the total for the Capacity box. The totals from “What Happens at School” and “What Happens at Home” were filled in the total for the opportunity box. Then, the numbers for Capacity and Opportunity were added together to fill in the number in the level of self-determination box.



Data from the SDS was analyzed using descriptive statistics to examine the Capacity, Opportunity and total self-determination levels of the students. The above-provided scoring key for the profiles was used to look at the individual students and analyze the measure of central tendencies in the Table 1 below to interpret the results, allowing for the data to be used to provide an overview of the students' levels of self-determination how individuals interact with opportunities aimed at enhancing their prospects of fulfilling their needs and desires in life. The group data identified specific areas where students show low Capacity or Opportunity. The statistics helped the researcher to understand how the students' scores on the AIR self-determination scale vary and whether there were any patterns or trends in the data. The descriptive statistics were also used to identify unusual data points that may require further investigation and a focus group interview.

Table 1

SDS Descriptive Statistics Template

	Capacity to be Self-Determined		Opportunity to Practice Self-determination					
	Things I Do	**How I Feel**	**What Happened at School**	**What Happened at Home**	**Mean**	**Median**	**Mode**	**Total Self-Determination**
Things I do								
Think								
Do								
Adjust								
How I feel								
Think								
Do								
Adjust								
What Happened at School								
Think								
Do								
Adjust								
What Happened at Home								
Think								
Do								
Adjust								

Notes: Thinking Identify and express own interests, needs, abilities. Set expectations and goals to meet needs, interests. **Doing** Make choices and planned to meet goals, expectations. Taking actions to complete plans. **Adjusting** Evaluate results of actions. Alter plans if actions, if necessary, to meet goals more effectively.

The demographic survey datasets were also analyzed using descriptive statistics to summarize the responses of the students, and the mean, median, and mode were calculated to provide an average score and a measure of the central tendency of the dataset. The data from the survey were entered into an Excel spreadsheet and checked for any errors or missing values. Descriptive statistics, including the mean, median, and mode for each question, summarized the students' responses and provide measures of central tendency and variability. Visual graphs, charts, and tables were created to enhance data interpretation, facilitate the

identification of patterns or trends, and highlight key findings. These visual aids were used to compare the results with previous research studies, which in turn, helped to identify areas for further investigation during the focus group interview. These distributions were compared to CCP state-reported statistics, such as gender, grade level, and socioeconomics. The results of the data analysis were interpreted using the research questions as a guide, and the key findings were identified, discussed and related back to the research questions. Lastly, the results of the data analysis were compared to those of previous research studies that focused on similar demographic information to identify outliers and correlations between different demographic variables.

The unofficial transcripts provided the GPA for each student, and descriptive statistics were used to complete the chart below. They were analyzed compared to student self-reported GPA, student actual GPA, and Ohio Department of Higher Education reported state average GPA CCP student averages; the individual student scores were also compared to these result scores. The unofficial transcripts were evaluated for trends and patterns such as high school courses taken, CCP courses taken, what grade the courses were taken, and the grade earned by the student. Studies by researchers, including Berry et al. (2022) and Schaller et al. (2023), revealed that participation in dual enrollment programs was positively associated with GPA and total earned college credits. The GPA has historically served as a benchmark for college admissions and reflected a student's academic preparedness (Taylor et al., 2022).

Qualitative Data

The qualitative data analyzed for this dissertation was conducted using Saldaña's (2013) two-cycle coding strategy to answer the research questions. Researchers rely on coding as a tool in qualitative research, where it serves as a construct to symbolize and interpret data. As

explained by Saldaña (2013), the application of codes helps facilitate the summarization and condensing of data, and this helped identify repetitive patterns of actions and consistencies in behavior. The documents were electronically uploaded into a qualitative data analysis software program (MAXQDA) to facilitate segmenting the text into codes. Analyzing the responses to these questions gave insight into the students' interests, values, and self-determination. Additionally, data was used to identify goal-setting and self-evaluation skills, which gave insight into the development of CCP policy and postsecondary attainment for students through identifying recurrent themes and patterns in the data, gaining a deeper understanding of student experience and perception.

The first coding cycle involved initial coding, which allowed provisional and tentative codes to be applied to analyze data for the focus group interviews and the three open-ended prompts that were included in the AIR SDS. The initial coding cycle was the first phase of a process where the researcher began by reading through the data to gain a general sense of its content. The process involved going back and forth between interview transcripts multiple times to eliminate, combine, group, and regroup emergent themes to organize the data into smaller, more manageable pieces. (Smith & Osborn, 2003). The researcher then assigned a descriptive label, or code, to each meaning unit, representing its content. These initial codes were identified based on the researcher's interpretation of the data, and the code that best fits the data being analyzedwas used rather than a pre-existing codebook. After the initial coding, the codes were reviewed for frequency, the relationship between codes, and underlying meaning across codes (Saldana, 2013). Then, the researcher examined the initial codes and grouped them into categories based on similarities in content or meaning.

Analyzing interviews and assigning categories or similar codes into broad sections was essential to group the data that would be investigated further in the second coding cycle. During the second coding cycle, the codes identified from the first cycle were used to develop coherent, categorical, themes and patterns emerging from the data (Saldaña, 2013). The similar initial codes were grouped together to create higher-level codes or categories. During the second cycle, the researcher refined or modified the initial codes as they gained a deeper understanding of the data. By pulling the emerging themes into a more meaningful and modest unit for analysis, theoretical models and perceived relationships that generated the secondary cycle coding data were revealed (Saldaña, 2013). The final step in the cycle was category refinement, where codes are added or removed as needed, and definitions are adjusted. Triangulation, a specific proven method, was used to verify that themes and trends discovered in the research study align with general observations.

The researcher must analyze and interpret the themes in the context of the research questions. The initial coding process addressed attributes as the essential information from the data to include and the second cycle coding served to re-code the initial, descriptive, and theme codes from the initial coding cycle. These codes then served as components for the attributes of data tables in the comparison analysis, Facilitating thematic analysis and the identification of recurrent themes and patterns to gain a deeper understanding of student experience and perceptions.

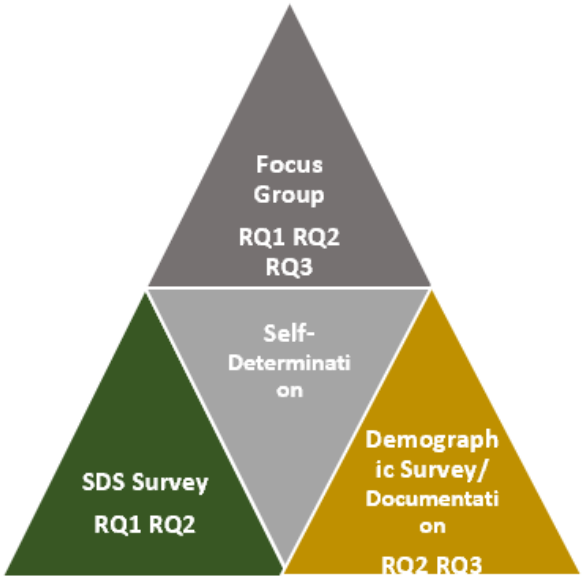
Triangulation

In this study, multiple methods or data sources were used to address the research questions. By administering data sources independently, the intent was to uncover some unique variances which otherwise may have been collected by a single method (Creswell, 2009). Flick

(2004) states that the application for triangulation has three primary uses: a validation strategy, an approach to the generalization of discoveries, and a route to additional knowledge. The research instruments were used to answer the research questions through the lens of self-determination (Figure 5). Understanding there are three basic assumptions to the theory that humans are inherently proactive, have an inherent tendency toward growth, and optimal development and actions are inherent in humans, but they do not happen automatically.

Figure 5

Research Question Triangulation



The focus group interviews and SDS survey were used to analyze research question one, what interests prompted high school students to enroll in a CCP environmental science course, and were there any self-determination factors that influenced their decision. Research question two pulled information from the focus group, demographic data, documentation, and the SDS survey to answer how similar are the pre-college experiences of students in a CCP environmental science course to the typical traits of dual enrollment students. The third research

question, what are the students' perceived values of the environmental science course on their understanding of environmental issues and preparedness for addressing environmental challenges in their personal and professional lives, was analyzed by using the data from focus group interviews, demographic survey information and documentation.

Assumptions

The researcher assumes all participants were forthright and truthful with the information provided on their experience with the CCP environmental science course. The subjects are assumed to have shared both positive and negative experiences. The information gathered from this study was not generalizable to all CCP environmental science course settings; however, the study is a fair representation of a high school-based CCP environmental course in Ohio and is congruent with previous dual enrollment studies.

Trustworthiness

The applied nature of educational investigation makes it crucial to have confidence in how the study was conducted and its results (Merriam, 1998). Merriam (1998) suggests expert analysis and triangulation as validation strategies to enhance a research study. These strategies serve to ensure the trustworthiness of findings and mitigate researcher biases.

The expert analysis strategy was implemented because the reliability of qualitative research can largely be enhanced through training and practice (Lincoln & Guba, 1985). In order to validate the assessment of the student's experiences in the dual enrollment environmental course and ensure the research design, data collection, data analysis and findings are consistent with the data the researcher gathered, an expert in the field of methodology served on the dissertation committee (Creswell, 2013; Merriam, 2002). The dissertation chair and committee added multiple views for analysis, reducing a single researcher's potential for bias. Emerging

themes could be reviewed and alternative theories of data interpretation, creation of domains, and core ideas were ensured (Patton, 2002).

An audit trail was also used to document each step of the study, ensuring conclusions were supported by data and analysis was conducted properly. Merriam (2002) and Patton (2002) state that using an audit trail to document how and when each step of the study was conducted and generally analyzed ensures the transparency of the research process and facilitates the replication of the study in the future. The additional measure of an audit trail reduced confusion in how perspectives and attributes were assigned, allowing a novice qualitative researcher to reflect and look for consistency to create a trail of their conclusions. By ensuring conclusions drawn were supported by data and data analysis was conducted properly there is support of "intellectual rigor, professional integrity, and methodological competence" (Patton, 2002, p. 570).

As discussed in the data analysis section, by triangulating data from multiple sources, researchers can improve the reliability and validity of their findings. A mixed-methods approach, which combines both qualitative and quantitative techniques, provides a more complete understanding of the research topic. By collecting data from various sources such as interviews, and documents, researchers can build justification for their findings in established themes (Creswell, 2009; Patton, 2002). This process of converging multiple sources of data adds to the validity of the study; however, the reliability of the study is limited to the consistency of the results of what the collecting data of another research. Merriam (1998) suggests that "the question is not whether findings will be found again, but whether the results are consistent with the data collected" (p. 206).

Chapter IV. Results

The focus of this study was to identify factors that motivate and influence high school students' decisions to participate in a high school-based dual enrollment environmental science course. Despite increasing participation in dual enrollment programs, little was known about the decision-making process that high school students undergo when selecting their courses (Jenkins & Fink, 2020; Marken et al., 2013; Taie & Lewis, 2020). Motivational theories were used as the conceptual framework to assess the aspects of autonomy, interest, competence, or self-worth, and self-determination served as the conceptual framework to assess these factors (Murray, 2011; Ryan & Deci, 2017). To provide insight into the factors influencing individual course choices, the researcher sought to identify the students' values in the course. This understanding could enable them to build on their interests and passions and apply the subject material to their future lives to understand the motivating factors behind dual enrollment pathway opportunities, particularly from the perspective of students (Taylor et al., 2022).

The study used a mixed-methods methodology, utilizing the AIR SDS, a demographic survey, document collection, and semi-structured focus group interviews to gather data and analyze emerging themes from students' insights. By connecting reform efforts to student dual enrollment participation, the study contributed to the development of interventions and policies that promoted equity in education strategies through STEM courses and decreased educational gaps while increasing access to higher education.

The research was guided by three main questions, which steered the analysis for the participation in CCP coursework:

1. What self-determined interests motivated high school students' decision to participate in a College Credit Plus Environmental and Society course?

2. How do the factors influencing the College Credit Plus Environmental and Society students compare to those influencing the typical dual enrollment student decision to participate in dual enrollment?
3. What value do students perceive in participation in a College Credit Plus Environmental and Society course?

The study population consisted of 14 high school Juniors and Seniors attending a small rural high school in Ohio, all of whom were enrolled in an Environmental and Society course taught by a University of Findlay instructor. Among the students sampled, ten were enrolled as CCP students, while four were non-CCP students who were not taking the course for college credit. All students self-identified as White/Caucasian. The gender distribution was as follows: eight females and six males. Within the non-CCP group, there were two males and two females. The CCP group was comprised of four males and six females.

The quantitative research data was collected from student participants through the AIR SDS survey. The data was analyzed using the non-parametric statistical method, the Wilcoxon rank-sum test. The test was employed because the two groups being compared exhibited different population medians. By comparing the sums of ranks between the two groups, the aim was to ascertain the differences in the distribution of values within each group and compare them statistically. Additionally, the Cohen's d score was calculated to measure effect size of the observed differences between the groups. Comparative statistics were also employed to compare data from non-CCP, CCP, and Ohio Department of Higher Education (ODHE) and Ohio Department of Education and Workforce (ODEW) with that of the student participants.

For the qualitative data, Saldana's (2013) two-cycle coding method was utilized to review interview transcripts and open-ended responses. The findings were then utilized to

identify and highlight key themes. A comparative analysis was conducted, which involved comparing themes, patterns, and documentation (Miles et al., 2020).

Instrument Validity and Reliability

Several steps were taken to ensure the validity and reliability of the instruments used in this study. The AIR SDS was chosen because it is a vetted instrument used to measure self-determination. The inclusion of demographic information within the survey enhanced the external validity of the study, which allowed for the generalization of the findings to the broader Ohio CCP population. Variables such as gender, GPA, and the number of college credits were tracked by the Ohio Department of Education and Ohio Department of Higher Education, enabling the generalization of the findings to the specific CCP study population.

To improve the reliability of the interview questions, the researcher piloted the questions to ensure their effectiveness before the beginning of the focus group interviews. This piloting phase involved reviewing feedback on interview questions to assess their ability to measure what they intend to measure. The questions were piloted with a similar but not identical group of CCP students from various rural Ohio high schools of similar size to the one in the study. The pilot students were randomly selected and participated voluntarily. Feedback from the pilot study was used to refine and improve the interview questions for clarity of instructions, clear wording, sufficient information, length, and overall convenience for participants. These were carefully evaluated in concurrence with established focus group interview practices (Seidman, 2013). The questions were intentionally designed to be open-ended and general, facilitating discussion and eliciting responses that would help provide insight into the study's research questions. It is worth noting that conducting a pilot study with the exact population was not possible due to the study's limited population size of ten CCP students and four non-CCP

students. Therefore, a similar population with similar characteristics and experiences was used to test the validity and reliability of the research instrument and methodology.

Research Question 1:***What self-determined interests motivated high school students' decision to participate in a College Credit Plus Environmental and Society course?***

Each participant in the study received an AIR SDS survey, which included basic demographic information. The theory of self-determination, as outlined by the AIR SDS, integrated the two aspects of capacities and opportunities. These core domains were essential components of understanding and assessing self-determination. Initially, students were required to demonstrate the competencies, perceptions and knowledge relevant to pursuing their interests and needs (Capacity). Additionally, they had to interact with available opportunities within their environment to fulfill these needs. To assess these aspects, the researcher evaluated the opportunities for exercising capacities in two primary environments where students typically functioned: the school setting and home environment. Charted below in Table 2 are the domains, definitions, associated subscales, and contents that collectively comprised the overall self-determination score.

Table 2

Self-Determination Domains and Subscale Definitions

	Domains	Define	Subscales	Content
Self-Determination	Capacity	Explore knowledge, abilities, and perceptions that enable to be self-determined and feel good about it.	Things I Do (TID)	Ability
			How I Feel (HIF)	Self-Awareness
	Opportunity	Assess chances to use knowledge and abilities at school and at home.	What Happened at School (WHAS)	Perception of opportunity at school
			What Happened at Home (WHAH)	Perception of opportunity at home

The results regarding the two domains of self-determination, namely Capacity and Opportunity, along with the three stages of the self-determination process (Thinking, Doing, and Adjusting), were initially evaluated using the mean score from the students' survey, as seen in Table 3.

Table 3

AIR Self-Determine Scale Survey Scores

Group			Mean Score
Non-CCP Students	**Self-Determination**		
		Total Self-Determination	75
	Two Domains	Capacity	37
		Opportunity	38
	Subscales	Things I Do	18
		How I Feel	20
		What Happened at School	16
		What Happened at Home	22
	Three Stages	Think	6.56
		Do	5.87
		Adjust	6.37
CCP Students	**Self-Determination**		
		Total Self-Determination	90
	Two Domains	Capacity	43
		Opportunity	47
	Subscales	Things I Do	22
		How I Feel	22
		What Happened at School	19
		What Happened at Home	27
	Three Stages	Think	8.15
		Do	7.47
		Adjust	7.13

The comparative analysis of mean scores on the AIR SDS Survey between CCP and non-CCP students provided intriguing insights into their perceptions of self-determination. Notably, CCP students exhibited higher mean scores across domains and subscales compared to non-CCP

students. While both groups perceived higher opportunities than capacities, the difference was more pronounced in the mean CCP student score. The mean perception of Opportunity (47) among CCP students was notably higher than that of Capacity (43), indicating a level of support at school and/or home to achieve their goals compared to their self-perceived abilities to set, pursue, and accomplish their desired goals (Table 3).

Further, comparison within the Capacity sub-scales revealed no significant difference in the belief in their abilities “How I Feel” compared to the level that students demonstrated goal setting, decision making, and planning “Things I Do”. However, the analysis of the Opportunity subscales suggested that students perceived greater opportunities for engaging in self-determined behaviors at home “What Happened at Home” compared to those available at school “What Happened at School” environment.

An analysis of the survey utilized the Wilcoxon rank-sum test, a non-parametric analysis method, to evaluate data from the AIR SDS on Capacity, Opportunity, and Self-Determination. Results from this test compared CCP students and non-CCP students revealed no statistically significant differences across these domains, including their respective subscales and stages (Think, Do, Adjust). The failure to reject the null hypothesis assumed no significant difference between the two groups at the 0.05 significance level; thus, these findings indicated no notable difference between the two groups concerning their capacities, opportunities, or the stages within these domains.

Utilizing Cohen's d test scores was instrumental in facilitating the analysis of effect size for the factors measured within the AIR SDS. This standardized measure allowed the researcher to present the practical significance of observed differences beyond statistical significance. By employing a standardized measure, group differences based on the survey variables were

thoroughly examined, allowing for a comprehensive evaluation of the magnitude of differences between the groups. The findings, outlined in Table 4, shed light on various patterns which are outlined in the next section.

The comparison between CCP students and non-CCP students, utilizing Cohen's d scores derived from the AIR SDS survey, revealed notable disparities in various domains of self-determination (Table 4). Starting with the Capacity domain, non-CCP students exhibited a lower score of -0.8961 when compared to CCP students. This difference suggests that non-CCP students perceived themselves as having fewer capabilities or skills in setting and achieving goals, decision-making, and planning compared to their CCP counterparts. Similarly, in the Opportunity domain, non-CCP students displayed a lower score of -1.1381, indicating that they perceived fewer opportunities for engaging in self-determined behaviors than CCP students.

When considering specific subscales such as "Things I Do" and "What Happened at Home," non-CCP students consistently displayed lower scores of -1.3876 and -1.3499, respectively, compared to CCP students. These differences imply that non-CCP students may have felt less capable or motivated to take action toward their goals and perceived fewer opportunities for self-determination within their home environment compared to CCP students. However, it is noteworthy that the difference in the "How I Feel" subscale was relatively smaller, with non-CCP students scoring only -0.4815 lower than CCP students. This suggests that while there were clear disparities in various aspects of self-determination between the two groups, the self-awareness component appeared to be less affected or less distinct in terms of differences. The Cohen d score for "What Happened at School" (-0.5620) indicated a difference between the CCP and non-CCP students' perception of opportunities for self-determined behaviors in the school environment. While there was some disparity in the perceived

opportunities for self-determination behaviors at school, it was not as pronounced as in other areas.

The total self-determination score (-1.0985) represented the overall difference between the two groups across all aspects measured by the AIR SDS. It indicated a general trend where CCP students exhibited higher levels of self-determination compared to non-CCP students, suggesting a greater degree of self-determination among CCP students participating in the environmental science course.

The outcomes derived from the AIR SDS further affirmed this trend, revealing that CCP students exhibited a greater degree of self-determination across both Capacity and Opportunity domains, as well as within the sub-scales and the three stages of Thinking, Doing, and Adjusting. Specifically, the mean total self-determination score was higher among CCP students than non-CCP students, indicating an overall greater level of self-determination in the CCP group.

Table 4

Cohen d Scores for Non-CCP and CCP students

	Cohen d_s Calculations	**Effect Size**	
Total Self-Determination	-1.0985	Large Effect Size	CCP Student Higher Mean Score
Capacity	-0.8961	Large Effect Size	CCP Student Higher Mean Score
Opportunity	-1.1381	Large Effect Size	CCP Student Higher Mean Score
Things I Do	-1.3876	Large Effect Size	CCP Student Higher Mean Score
How I Feel	-0.4815	Medium Effect Size	CCP Student Higher Mean Score
What Happened at School	-0.5620	Medium Effect Size	CCP Student Higher Mean Score
What Happened at Home	-1.3499	Large Effect Size	CCP Student Higher Mean Score
Think	-1.7526	Large Effect Size	CCP Student Higher Mean Score
Do	-1.0257	Large Effect Size	CCP Student Higher Mean Score
Adjust	-0.5533	Medium Effect Size	CCP Student Higher Mean Score

Note. Cohen d scores 0.20 small effect, 0.50 medium effect and 0.80 a large effect.

Table 5

Three Stages of Self-Determination

Thinking	Identify and express own needs, interests, and abilities.
	Set expectations and goals to meet these needs and interests
Doing	Make choices and plans to meet goals and expectations.
	Take actions to complete plans.
Adjusting	Evaluate the results of actions.
	Alter plans and actions, if necessary, to meet goals more effectively.

The three stages of the self-determination process (Table 5), including Thinking (identify and set goals to meet needs), Doing (make choices and take actions to meet goals), and Adjusting (evaluate results and alter plans if necessary), were analyzed. The analysis in Table 4 extended to the three stages of the self-determination process (Thinking, Doing, and Adjusting), revealing that CCP students demonstrated a higher level of self-determination across all stages compared to non-CCP students. Particularly, CCP students exhibited greater confidence in setting goals and taking action to achieve goals than in Adjusting plans based on evaluation or results.

Comparisons revealed that students expressed higher levels of belief in their ability to set goals to meet their needs than in their Capacity to Adjust plans, particularly among CCP students compared to the non-CCP students. CCP students were more likely to make choices and take action to meet goals than Adjust plans. This suggested that confidence in one stage may have positively influenced beliefs in one of the other two stages. Nonetheless, these results suggested that CCP students were more inclined to make choices, formulate plans and act to meet goals and expectations than non-CCP students. The comparison of mean scores and Cohen's d scores on the AIR SDS Survey between CCP and non-CCP students revealed interesting insights into their perceptions of self-determination. Assessment of the likelihood to use knowledge and abilities at school and at home revealed differences in perceived opportunities between the two groups. CCP students generally reported higher mean scores across most domains and subscales compared to

non-CCP students. The Cohen's d scores revealed notable differences between CCP and non-CCP students across various domains of self-determination. CCP students consistently demonstrated higher scores, indicating greater self-perceived capabilities and opportunities for engaging in self-determined behaviors compared to their non-CCP peers.

However, it was essential to interpret these findings cautiously due to the limitations of the scale, including the lack of normative data and standardization by age levels. This suggested that CCP students were more inclined to make choices, formulate plans, and act to meet goals and expectations than non-CCP students (see Table 3). It was important to recognize that the AIR SDS Survey cannot be used for diagnostic purposes, nor does it have predictive validity. Moreover, considering the gender differences observed in self-determination levels among CCP students, it is important to delve deeper into these findings.

Gender

Upon comparing the four male and six female CCP students, female students perceived higher levels of self-determination than their male counterparts (Table 6). In sub-scales of Capacity, the perceptions of females' and males' self-determination had no significant differences; however, the perceptions of Opportunities available between gender groups did show differences. Specifically, female students reported greater opportunities both at school and at home to engage in self-determined behaviors compared to male students.

When exploring the perceptions of three stages of self-determination, only the male students' perceptions of Adjusting were higher than those of female students; no significant differences were found in the rating of Thinking and Doing based on gender. Overall, it appeared that male students' self-determination scores tended to be lower compared to their female counterparts. While it did not appear to be a significant difference, it might lend merit to why

more females enroll in CCP coursework than males (Harper, 2015; Shields et al., 2021; Taylor et al., 2022).

Table 6

CCP Student Gender Distribution and AIR SDS Mean Scores

CCP		Self-determination	Two Domains		Three Stages		
Gender	Total	Overall	Capacity	Opportunity	Think	Do	Adjust
Female	6	91	44	48	8.2	7.8	6.9
Male	4	88	43	45	8.1	7.1	7.2

The Wilcoxon rank-sum test was used to evaluate data from the evaluation of the environmental science course for male and female CCP students. Results from this test compared CCP students by gender and revealed no statistically significant differences. The failure to reject the null hypothesis assumed no significant difference between the two groups at the 0.05 significance level; thus, these findings indicated no notable difference between the two groups.

The Cohen's d score for environmental science (Table 7) for male and female CCP students revealed for self-determination, Capacity and Think domains, the effect size between the two groups was small, indicating a minor difference. However, females had a slightly higher mean score on average in these domains. For Opportunity and Do domains, females had a higher mean score compared to males, and the effect size was medium. In the ability to Adjust domain, male students had a higher mean score with a medium effect size. The results suggested variations in how male and female CCP students perceive their self-determination. Female CCP students had a higher mean score in all areas except the ability to Adjust their ability to evaluate the results of their actions and alter plans to meet goals more effectively.

Table 7

Cohen d Scores for Male and Female CCP students

Self-Determination	-0.2240	Small Effect Size	Female higher mean score
Capacity	-0.0821	Small Effect Size	Female higher mean score
Opportunity	-0.3405	Medium Effect Size	Female higher mean score
Think	-0.0421	Small Effect Size	Female higher mean score
Do	-0.4010	Medium Effect Size	Female higher mean score
Adjust	+0.3579	Medium Effect Size	Male higher mean score

Note. Scores for Cohen d score 0.20 indicates a small effect, 0.50 indicates a medium effect and 0.80 indicates a large effect.

AIR SDS Short Answer

The AIR SDS survey also included three short open-ended questions. The first prompt was, "Give an example of a goal you are working on." Non-CCP students predominately focused on academic achievements, such as maintaining high grades or performing well on upcoming midterms. In contrast, CCP students primarily emphasized extracurricular or personal goals, such as excelling in sports, prioritizing personal health, or preparing for college. This highlighted a distinct contrast between short-term and long-term goals, indicating that CCP students tended to prioritize future-oriented aspirations to a greater extent.

The second question, "What are you doing to reach this goal?" elicited responses showcasing varying levels of commitment and personal accountability. Non-CCP students described studying habits such as reviewing notes, seeking help from teachers, or studying when time permitted. On the other hand, CCP students demonstrated a higher degree of personal commitment, detailing specific actions such as daily workouts, dietary changes, scholarship applications, and proactive meetings with guidance counselors. The third open-ended question, "How well are you doing in reaching this goal?" yielded predominately positive responses, with most students expressing confidence in their progress. However, one non-CCP student

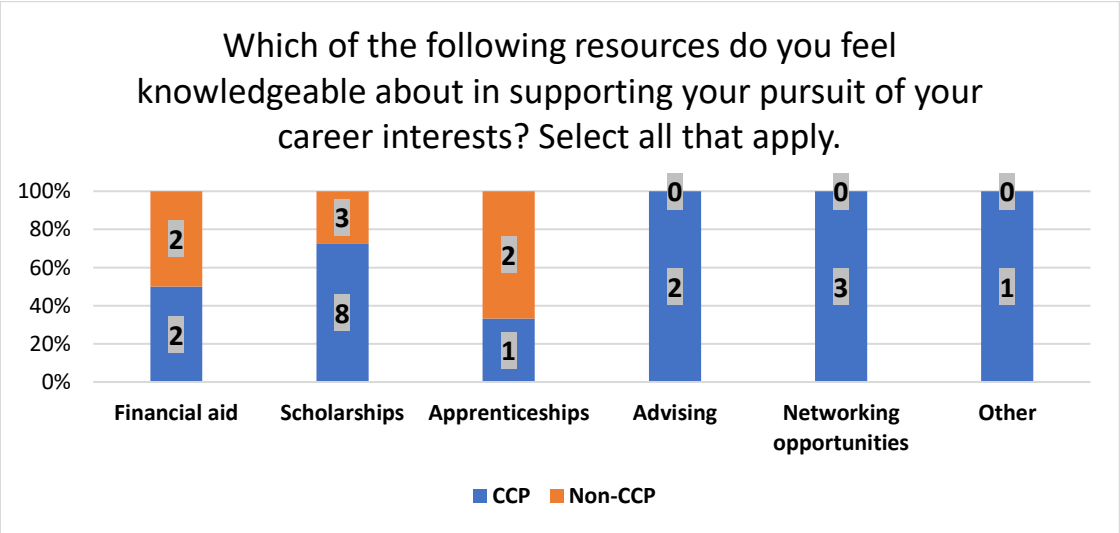
acknowledged feeling slightly behind and expressed a determination to continue striving toward their goal.

Capacity of Resource Knowledge

A demographic question was designed to gauge students' awareness and familiarity with resources relevant to their career aspirations. It also aimed to explore their perception of knowledge and ability, which could influence their belief in their capacity to achieve future goals. Students' answers were selected from predetermined options in the survey instrument, as detailed in Figure 6. These results indicated that both student groups expressed confidence in their knowledge of scholarship opportunities. However, it was noted that CCP students exhibited limited awareness regarding financial aid and apprenticeship opportunities, potentially influencing their future endeavors. There appeared to be a mixed level of awareness seen in advising and networking opportunities for CCP students, while the non-CCP group appeared to lack knowledge about these resources.

Figure 6

Student Resource Support Knowledge



Post-Secondary Aspirations

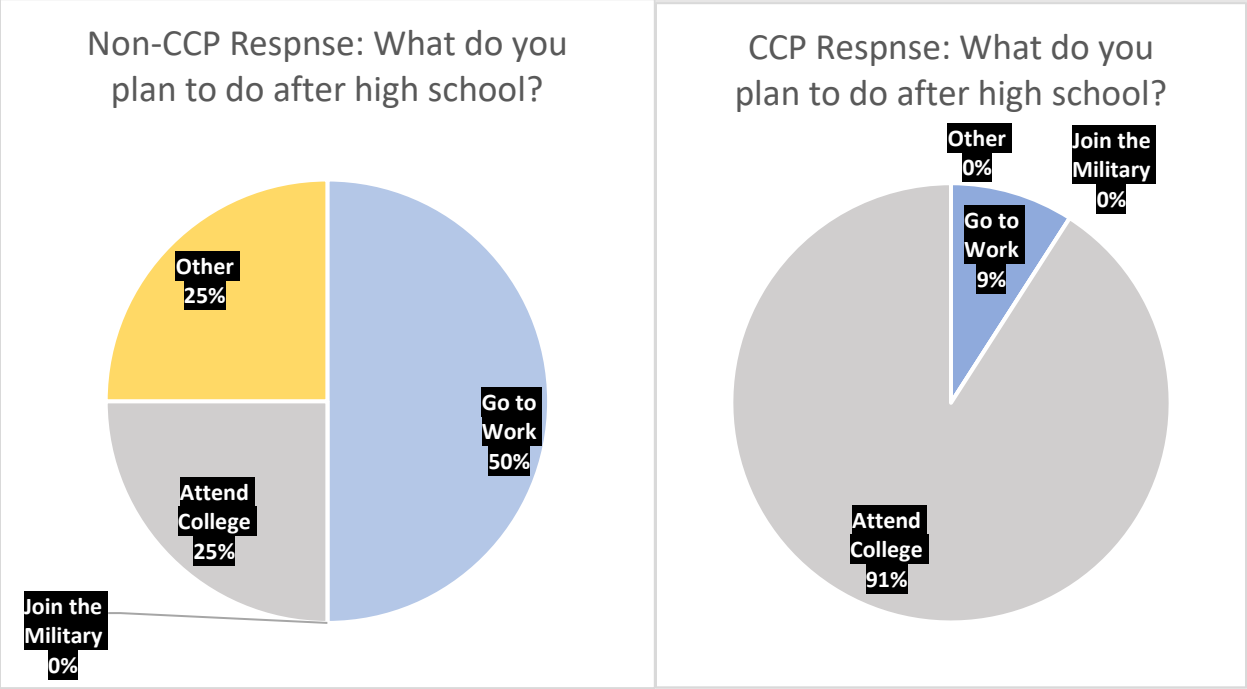
When asked, "What do you plan to do after high school?" students were given the option to choose to work, join the military, attend college, or do other things. The results revealed a distinct difference between the two groups (Figure 7).

Among the non-CCP group, half the respondents indicated their intention to enter the workforce directly after high school, suggesting a preference for immediate employment. One non-CCP student who selected "other" stated they were "not fully sure yet," while another expressed interest in pursuing higher education. There were no respondents from the non-CCP group who expressed a desire to join the military.

In contrast, the CCP group exhibited a markedly different trend. A substantial majority of the CCP respondents (91%) expressed their intentions to attend college after high school, suggesting a strong inclination toward pursuing higher education among CCP students. Additionally, a much smaller portion of the CCP students (9%) indicated their intention to enter the workforce directly after high school compared to the non-CCP students. There were no CCP students who expressed a desire to join the military or pursue other paths. Overall, the results highlighted the differing post-high school aspirations between the non-CCP and CCP groups, with the CCP cohort demonstrating a significantly higher propensity for college attendance and a lower inclination towards immediate workforce entry. It is worth noting that while the survey did not allow the students to express a specific field of study they intended to pursue in college, the focus group interview inquired about the students' future career aspirations.

Figure 7

Survey Post-Secondary Aspirations Results



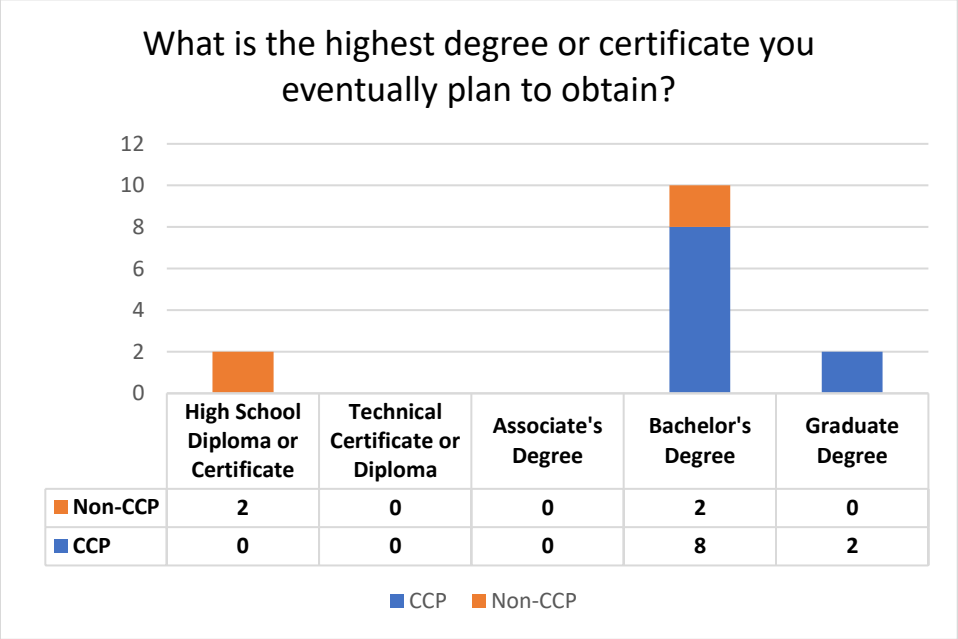
Educational Aspirations

The responses noted in Figure 8 below highlighted the prevalent aspiration among both CCP and non-CCP groups to pursue higher education, particularly at the undergraduate level. However, it was important to note that a portion of the non-CCP group only intended to complete high school, indicating a set of students with different educational trajectories. Specifically, among the non-CCP students, two hoped to attain a high school degree, while two aspired to achieve a bachelor's degree. In contrast, within the CCP group, the majority (91%) expressed their intentions to attain a bachelor's degree, showcasing a strong commitment to undergraduate education. Notably, two CCP students expressed aspirations for graduate-level education, indicating a subset of students with ambitions beyond the undergraduate level. These findings showed the diverse educational aspirations between CCP and non-CCP student populations, reflecting the varied educational pathways and goals among high school students.

The students' aspirations directly influenced their educational trajectory and how they planned to pursue education.

Figure 8

Survey Educational Aspirations Results



Sibling College Access

The demographic survey question, "Do you have siblings who attend college?" revealed differences in the presence of siblings attending college between CCP and non-CCP students. Among CCP students, 60% reported having siblings who attended college, whereas among non-CCP students, only 25% reported having siblings who attended college. These findings suggested that CCP students were more likely to have siblings pursuing higher education than their non-CCP peers. This disparity could have had implications for students' self-determination. For CCP students with siblings in college, access to firsthand experiences, resources, and supportive networks may have contributed to enhancing their confidence and motivation to pursue their academic and career aspirations.

Research Question One Overview

The first research question investigated the self-determined interests that motivated high school students to enroll in a CCP environmental science course. Each participant received an AIR SDS survey, which assessed capacities and opportunities related to self-determination. The AIR SDS survey looked at the students' perceived abilities and opportunities. The researcher utilized mean scores, the Wilcoxon rank-sum test, and Cohen's d score to analyze the data. Mean scores were calculated to compare the average responses between the two groups. Cohen's d score was employed to assess the effect size, indicating the practical significance of observed differences beyond statistical significance. The Wilcoxon rank-sum test, a non-parametric statistical method, was utilized to compare distributions.

The mean scores and Cohen's d score results showed that CCP students generally had higher scores across domains and subscales than non-CCP students. The mean scores showed that both groups perceived higher opportunities than capabilities. CCP students exhibited a higher mean score for their perception of opportunities, especially at home. However, Cohen's d scores highlighted disparities, with CCP students showing greater self-perceived capabilities and opportunities. CCP students demonstrated higher levels of self-determination across all stages of the compilation of AIR SDS results compared to non-CCP students, suggesting a greater inclination to make choices and act to meet goals. The Wilcoxon rank-sum score indicated no significant differences in self-determination between CCP and non-CCP students. Overall, the findings suggested that CCP students were more inclined towards self-determined behaviors compared to non-CCP students.

Additionally, comparisons between male and female CCP students in terms of self-determination levels were evaluated. There were disparities in self-determination levels, with

female students perceiving higher levels of self-determination compared to their male counterparts, particularly in perceiving greater opportunities for engaging in self-determined behaviors. While no significant differences were found in perceptions of capacity between genders, the perceptions of opportunities differed.

Analysis of responses to open-ended AIR SDS survey questions revealed that CCP students tended to prioritize future-oriented aspirations and personal development goals, while non-CCP students focused more on immediate academic achievements. Moreover, the study explored the students' awareness and familiarity with resources relevant to their career aspirations, finding that both groups expressed confidence in their knowledge of scholarship opportunities. However, CCP students exhibited limited awareness regarding financial aid and apprenticeship opportunities, potentially influencing their future endeavors.

Post-secondary aspirations also varied between CCP and non-CCP students, with CCP students showing a stronger inclination towards attending college after high school. The presence of siblings attending college was also explored, revealing a higher portion of CCP students having siblings pursuing higher education. These findings provide insights into the factors influencing high school students' decisions to participate in CCP coursework and their subsequent self-determination levels.

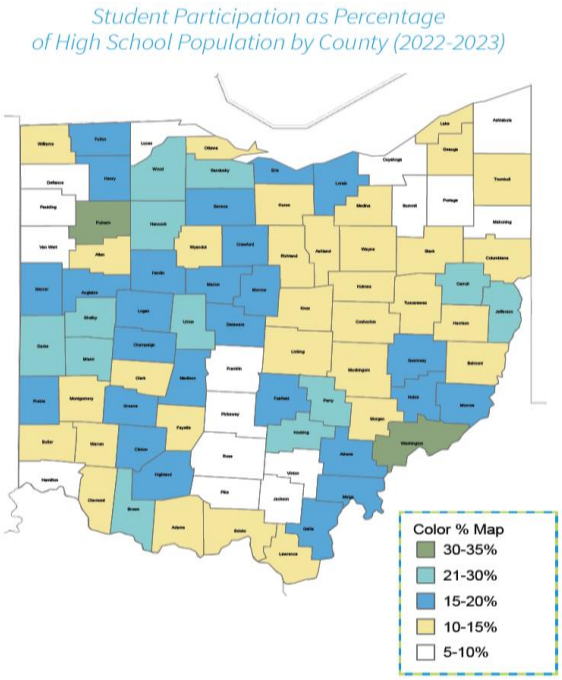
Research Question 2: ***How do the factors influencing the College Credit Plus Environmental and Society students compare to those influencing the typical dual enrollment student decision to participate in dual enrollment?***

Understanding the study participants within the context of the Ohio Department of Higher Education (ODHE) Report on CCP statistics offered insight into how these students compared to other enrolled CCP students. All participants in this study self-identified as White and without disabilities; therefore, race and disability were not addressed. The study compared

Ohio public school enrollment in CCP in grades 9 through 12. Only high school Juniors and Seniors were included in this study, and it is worth noting that the county in Ohio where the students resided had a CCP participation rate ranging from 10-15%. Figure 9 shows the comparison of student participation by county analysis across the state of Ohio for CCP participation.

Figure 9

ODHE compares all CCP enrollment to Ohio public school headcount in grades 9 through 12



Note. From Ohio Department of Higher Education. (2024). College Credit Plus Annual Report 2022-2023. https://highered.ohio.gov/initiatives/access-acceleration/college-credit-plus/ccp

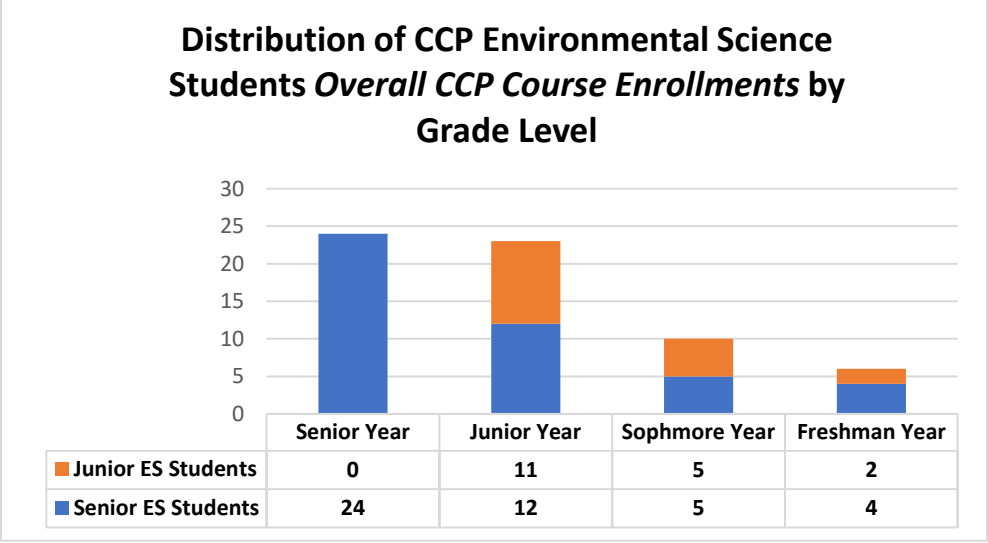
Enrollment by Grade Level

The demographic survey results indicated a pattern of enrollment among the CCP environmental science students that closely mirrored the state trends observed in Ohio. Figure 10

displays the distribution of students across different grade levels in the CCP environmental science course.

Figure 10

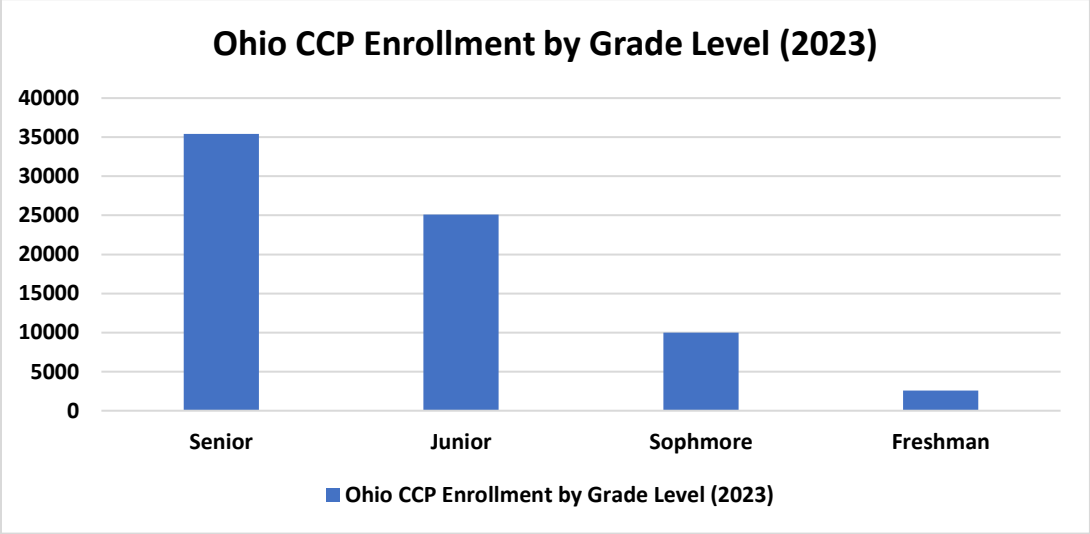
Distribution of CCP Environmental Science Students Overall CCP Course Enrollments by Grade Level



These figures illustrate a progressive increase in overall CCP course enrollment among Senior and Junior students from Freshman to Senior year. Comparing these CCP enrollment figures with the ODHE report for 2023 CCP enrollment by grade level (Figure 11) further underscored this consistency of increased participation in CCP courses as the students progressed through their high school journey. Enrollment in the environmental science for this study does not have a college prerequisite for enrolling, nor does it have a mandated high school grade-related requirement. Hence, these students would only need to qualify for the Ohio CCP program to participate. The alignment between the distribution of CCP environmental science students and the statewide enrollment trends in Ohio suggested a uniform enrollment pattern across grade levels, indicating consistency in enrollment distribution across the state.

Figure 11

Ohio CCP Enrollment by Grade Level (2023)



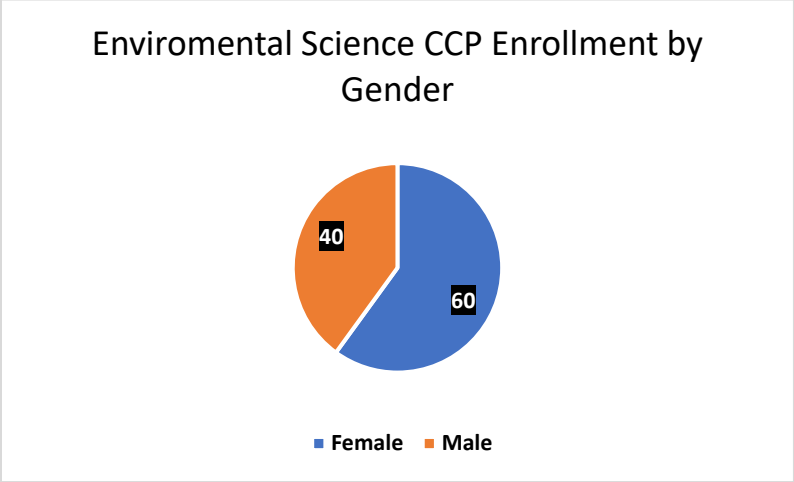
Note. Adopted from Ohio Department of Higher Education. (2024). College Credit Plus Annual Report 2022-2023. https://highered.ohio.gov/initiatives/access-acceleration/college-credit-plus/ccp

Enrollment by Gender

The analysis of enrollment by gender in the CCP environmental science course revealed a noticeable disparity, with female students participating at a higher rate than males. Specifically, among CCP environmental science course students, there was a clear trend of greater female enrollment than their male counterparts. Figure 12 illustrates the distribution of female and male students in the CCP environmental science course. Furthermore, Figure 13 reinforces this trend, indicating a higher representation of female students (58.6%) in CCP programs statewide. This consistent enrollment pattern across Ohio CCP programs suggested a prevalent preference for female participation in dual enrollment programs.

Figure 12

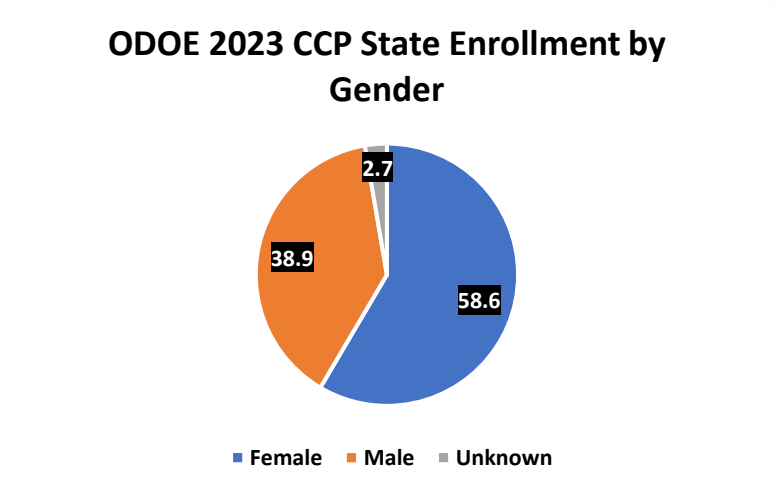
Distribution of Environmental Science CCP Students by Gender



Note. Data was compiled from the research survey where students self-identified their gender.

Figure 13

Distribution of Ohio CCP Students by Gender



Note. Adopted from Ohio Department of Higher Education. (2024). College Credit Plus Annual Report 2022-2023. https://highered.ohio.gov/initiatives/access-acceleration/college-credit-plus/ccp

Socioeconomic Status

The findings revealed that the majority of study participants reported being ineligible for free or reduced-price lunch during high school, as indicated in Figures 14 and 15. This served as an indicator of SES within the secondary school system. Among CCP students, nine stated they were not eligible for free or reduced-price lunch, while one CCP student stated they were unsure of their eligibility status. Among the non-CCP students, half reported not qualifying for free or reduced-price lunch, while one stated they qualified, and another was unsure.

However, it is important to note that this reported data differed from the information provided by the ODHE for dual enrollment participants in this study, as demonstrated in Figures 14 and 16. The state data on CCP students by economic status reported that 69% of statewide participants in CCP were not economically disadvantaged. In contrast, this study's participants reflected a higher proportion, with 90% reporting not being economically disadvantaged.

According to the U.S Census Bureau Reporter (2022), the economic makeup of the study's school district showed that 35% of households earned over $100k per year, 29% earned between $50-$100k per year, and 37% earned under $50k per year. The per capita income for the school district was reported to be 18.6% below the state average. The rate of children under the age of 18 living in poverty in the school district was 14.2%, which was 4.1% lower than the state average for children in the same age group living below the poverty line. Furthermore, data from the ODHE (2023b) reported that 46.26% of the students at the research site school district received free and reduced lunch, compared to the state average of 56.39% for schools receiving funding for reduced and free lunches.

Figure 14

CCP Environmental Science Course Students by Economic Status

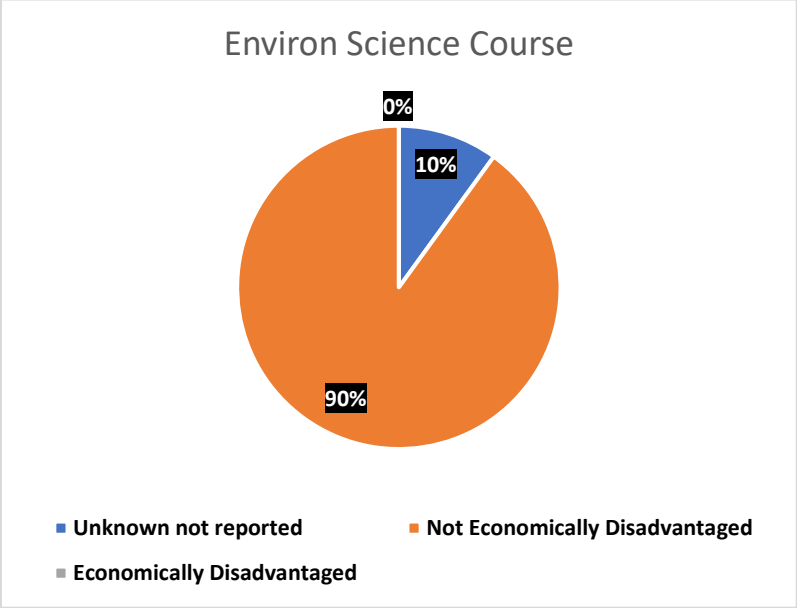


Figure 15

Non-CCP Environmental Science Course Students by Economic Status

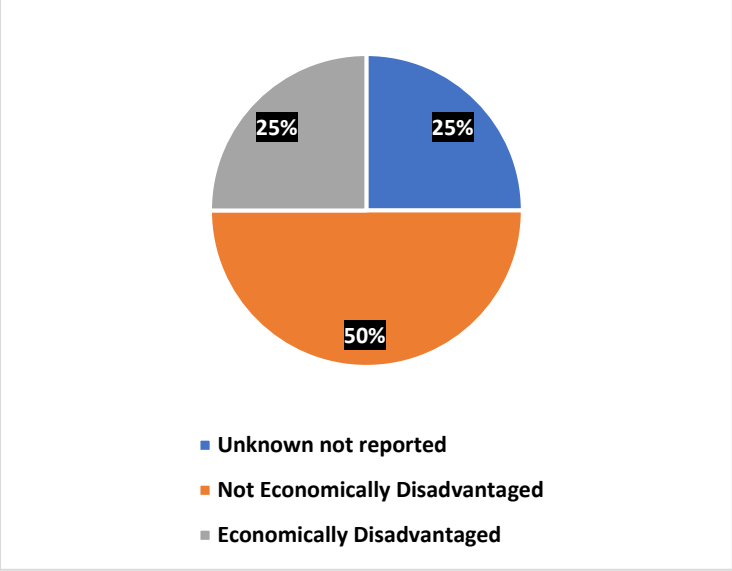
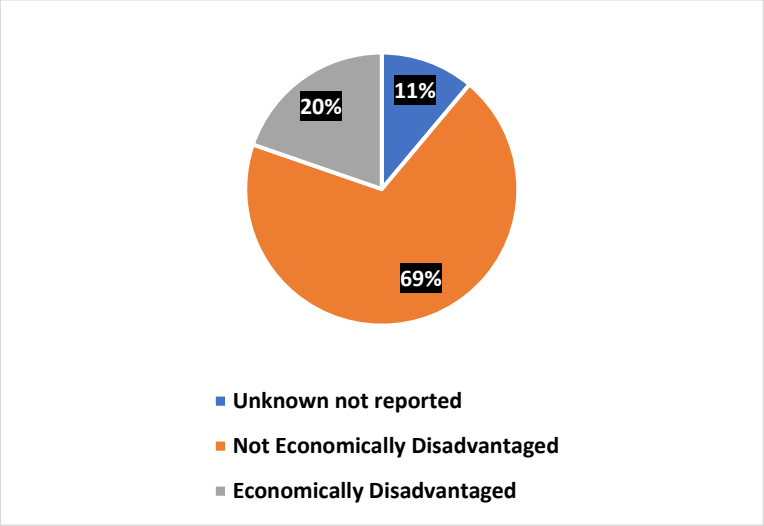


Figure 16

2023 State of Ohio Total CCP students by Economic Status



Note. Adopted from Ohio Department of Higher Education. (2024). College Credit Plus Annual Report 2022-2023. https://highered.ohio.gov/initiatives/access-acceleration/college-credit-plus/ccp

Parental Education

Parental education significantly influences one's social possibilities and privileges. In self-determination research, this concept has been characterized by household income and eligibility for free or reduced-price lunches (Deci & Ryan, 1991). As shown in Figure 17 below, respondents to this survey were also questioned about the educational backgrounds of their families, particularly the highest degree of education their parents had received. The parental education level often serves as a proxy for socioeconomic class and can impact various elements of the student experience (Sirin, 2005).

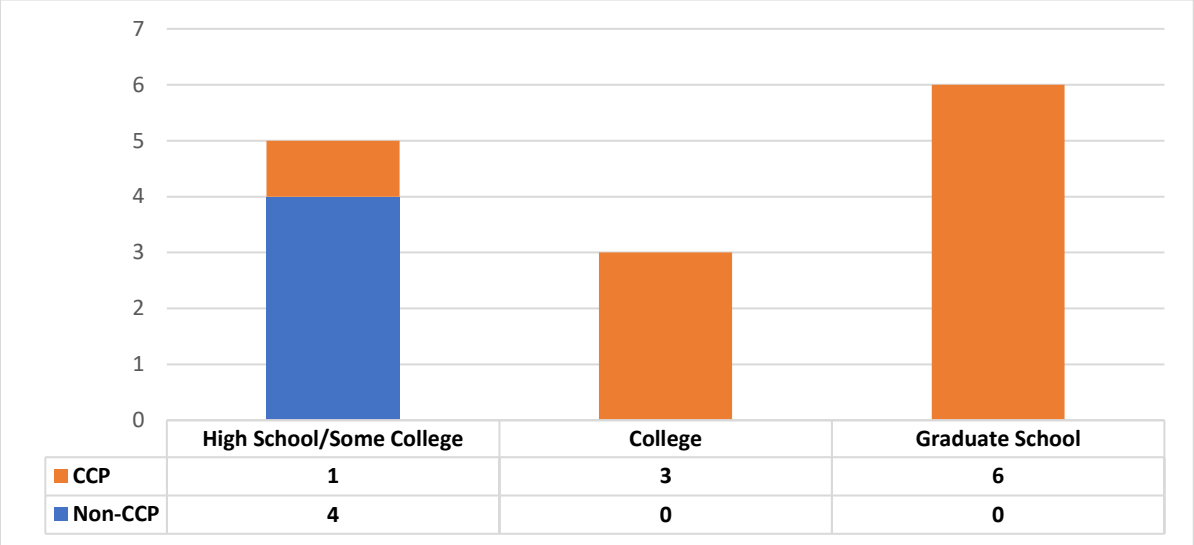
A closer look revealed differences between non-CCP and CCP students regarding parental educational attainment. In comparison, the majority of CCP students reported having at

least one parent with a bachelor's degree or graduate degree, while non-CCP students had parents who completed only high school or some college. Furthermore, identifying potential first-generation college students within the study groups underscored the importance of considering familial educational backgrounds in understanding students' educational goals and aspirations. This disparity underscored the importance of familial educational backgrounds in understanding students' educational aspirations, particularly in identifying potential first-generation college students with in the study groups.

According to U.S. Census Bureau Reporter (2022), the educational attainment in the research site's school district revealed that 92.6% of people held a high school diploma or higher and 18.2% held a bachelor's degree or higher. The CCP students reported that 90% of their parents held a bachelor's degree or higher. Sixty percent of the CCP students reported their parents held a graduate degree, compared to the average district population of only 6% who held a post graduate degree. The aforementioned data illuminated the educational background of the participants' families and offered valuable perspectives on the possible impacts of parental education on their educational journeys and goals.

Figure 17

Parents' Education Level



Courses Enrollments

Table 8 presents the enrollment status of each environmental science student across different grade levels, indicating the number of CCP courses each student enrolled per year. The inclusion of "N/A" denotes students not yet enrolled in their Senior year of high school.

Table 8

CCP Environmental Science Students Courses taken by students per year

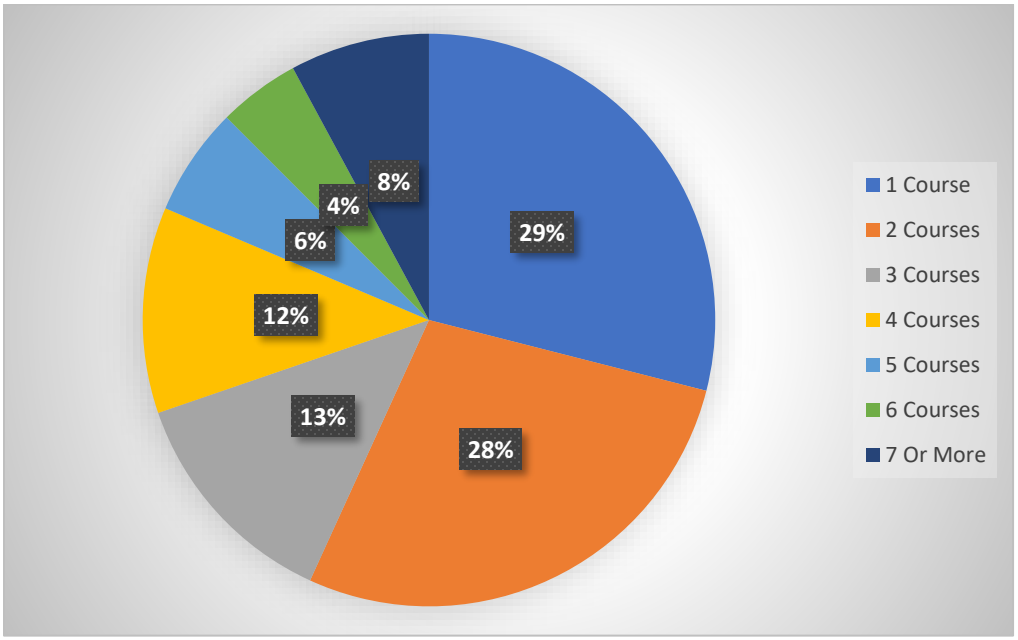
	Student 1	Student 2	Student 3	Student 4	Student 5	Student 6	Student 7	Student 8	Student 9	Student 10
Freshman	1	1	1	1	0	0	0	1	0	1
Sophomore	1	1	1	1	0	1	0	2	1	2
Junior	2	1	1	1	0	4	3	5	4	1
Senior	4	1	5	3	1	5	6	N/A	N/A	N/A
Total	8	4	8	6	1	10	9	8	5	4

A comparison with the 2023 ODOE CCP report (Figure 18) revealed notable differences. Figure 19, depicting course enrollments among environmental science CCP students, showed

contrasting trends compared to statewide data. While a majority of environmental science CCP students in the study took fewer courses, with 60% opting for just one course, statewide data indicated a more even distribution, with 57% of CCP students statewide taking 1 to 2 courses. This variance suggested potential lower variations in course enrollment patterns between the students in this study and the broader population of CCP participants in Ohio, which might reflect a unique preference or circumstances among the study participants.

Figure 18

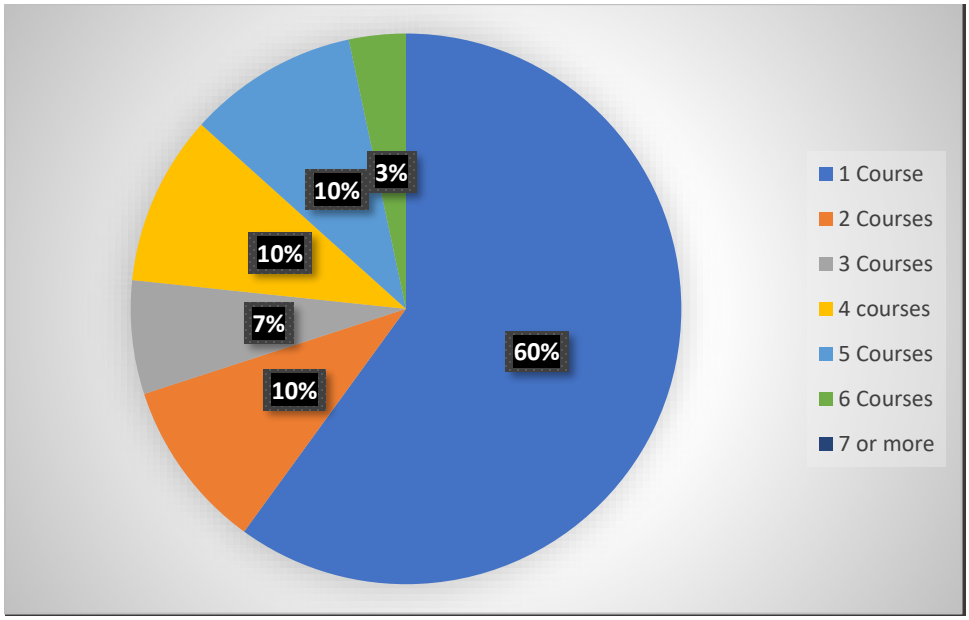
2023 ODOE number of courses taken Course Enrollments



Note. Adopted from ODHE (2024). CCP Annual Report 2022-2023. https://highered.ohio.gov/initiatives/access-acceleration/college-credit-plus/ccp

Figure 19

Environmental Science CCP Student Course Enrollments



Course Count by Subject

In order to interpret the data, the courses taken were grouped and organized into categories for analysis. Table 9 illustrates the distribution of subject areas according to the ODHE CCP report. Concurrently, Table 10 displays the subject areas where the environmental science students had enrolled.

Table 9

Ohio CCP Report Course Subject Areas

CCP Report Subject Area
Arts & Humanities
Business
Computer & IT Support
Criminal Justice
Education
Engineering
English
Health
History
Math
Physical Education
Science
Services
Social & Behavioral Sciences
Social Sciences
Trade and Repair Technician
Unclassified

Note. Adopted from ODHE. (2024). CCP Annual Report 2022-2023.

https://highered.ohio.gov/initiatives/access-acceleration/college-credit-plus/ccp

Table 10

CCP Environmental Science Students

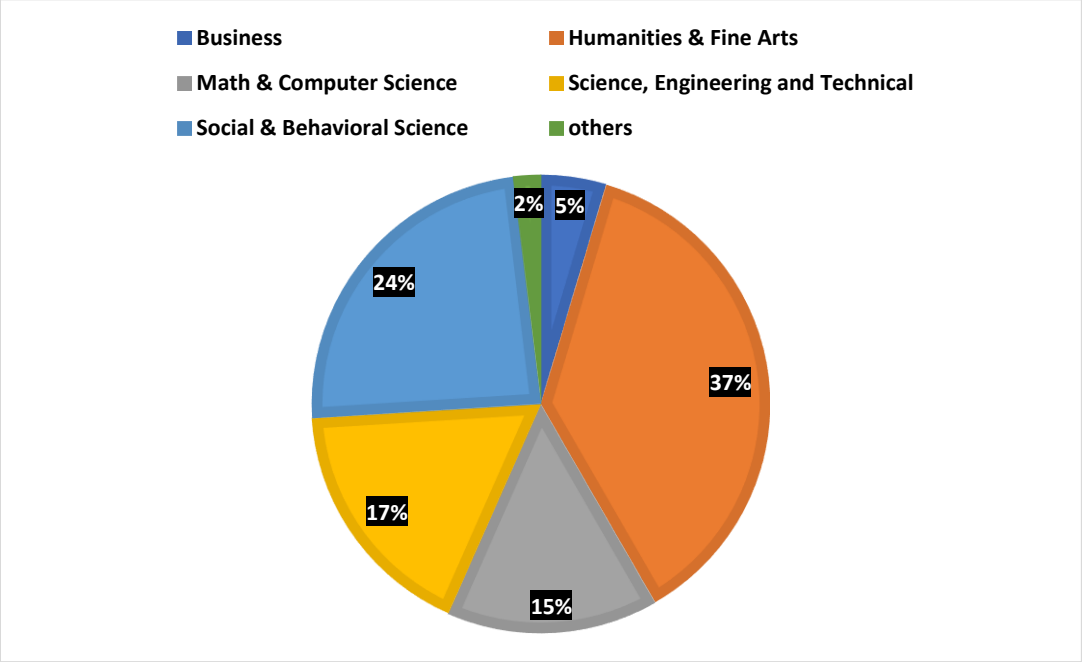
ESC CCP Students		
Category	Subjects	Credits
Arts & Humanities	Spanish, English Composition, Literature, Public Speaking, Technical Writing, Introduction to Graphic Design, Create Digital Editing	28
Business	Accounting, Economics, Business Communication, Principles of Management	4
Computer Science & Math	Computer Applications, College Algebra, Statistics,	5
Engineering, Science, and Technical	Environmental Science, A&P, Medical terminology, Basic Nutrition	19
Social Science and Behavioral Science	Sociology, General Psychology, World Civilization, Basic Human Studies	7

The subjects from the ODOE classification for Criminal Justice, Education, Physical Education, Services, Trade and Repair, and Health were combined with the Unclassified subject area and designated "Other" in Figure 20. The combining of subjects from the ODHE classification allowed for comparative analysis, hence consolidating to place the focus on the main areas of study while accounting for the less prevalent areas of study. This approach aided in discerning overarching patterns and trends in course select among the environmental science CCP students and the state-reported CCP participants. The tables allowed for a comparative analysis between the studies of CCP environmental science students and the broader ODHE report (Figure 21). Through the analysis, the distinct academic course interests of the CCP environmental science students indicated a deviation from the overall trend seen in CCP enrollment.

The analysis showed differences in course enrollments between CCP environmental science students and the ODHE CCP report. The environmental science students demonstrated distinct academic interest, with 8% more humanities courses and 13% more science courses compared to the ODHE data. Conversely, they pursued 7% fewer math and computer courses and 13% fewer social and behavioral science courses; however, they had engaged in 1% more business coursework than other CCP students in the ODHE report. This insight into the course preferences of the CCP environmental science students within CCP highlights the unique academic course selections of these CCP environmental science students.

Figure 20

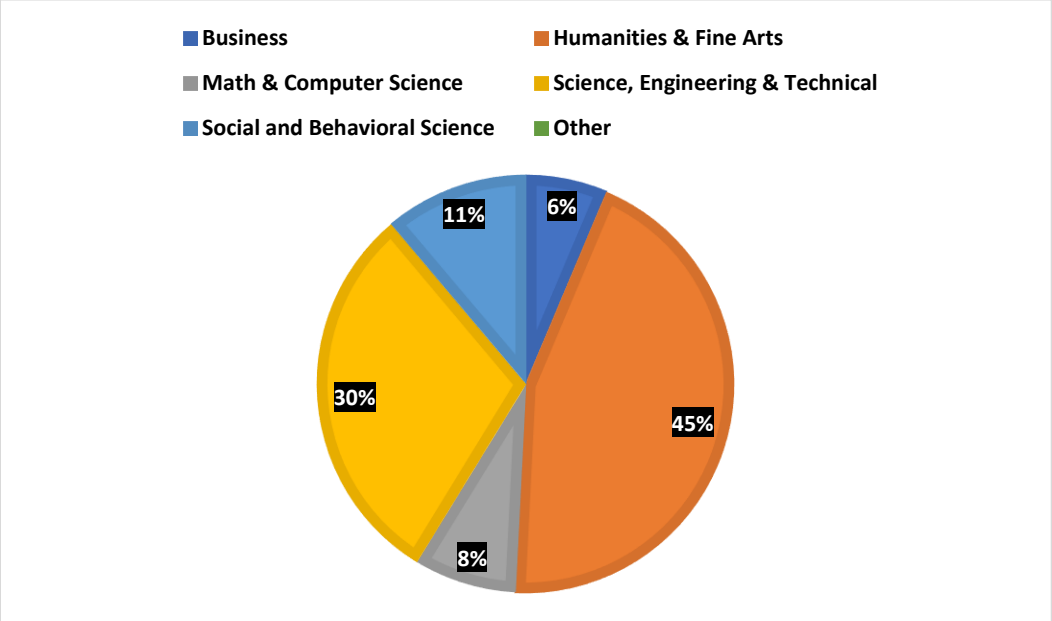
2023 ODOE CCP Course Counts by Subject



Note. Adopted from Ohio Department of Higher Education. (2024). College Credit Plus Annual Report 2022-2023. https://highered.ohio.gov/initiatives/access-acceleration/college-credit-plus/ccp

Figure 21

Science Course CCP Student Course Count by Subject



Grade Point Average

In addition to collecting demographic data, educational information was gathered through survey responses. The self-reported GPAs on the survey instrument closely mirrored the documented GPA on the student transcript, indicating consistency across reporting methods.

Table 11 displays the high school transcript-reported GPA and class ranks for CCP environmental science students, revealing high academic achievement. Many students maintained GPAs of 4.00 and earned top-class ranks. In contrast, non-CCP environmental science students exhibited a wider range of GPAs and class ranks, with some students ranking significantly lower.

Table 11 also highlights students' class rank, revealing that among the six Senior CCP environmental science students participating, four were tied for first in their class with the highest GPAs. Similarly, among the four participating Junior CCP environmental science

students participating, two were tied for first in their class. Notably, three non-CCP students ranked lower than the CCP participants; however, one non-CCP Junior student carried a 4.0, placing them academically at the top of their class.

The Wilcoxon rank-sum test was employed to analyze the data assessing environmental science course GPA and class rank among the students. The results from this test compared non-CCP and CCP students by GPA and class rank, revealing no statistically significant differences in GPA. The failure to reject the null hypothesis assumed no significant difference between the two groups at the 0.05 significance level for GPA; thus, these findings indicated no notable difference between the two groups. However, a statistically significant difference in class rank was observed at the 0.05 significance level, resulting in the rejection of the null hypothesis for class rank.

Table 11

ESC Students GPA and Class Rank

CCP ESC Students' GPA and Class Rank										
	Student 1	Student 2	Student 3	Student 4	Student 5	Student 6	Student 7	Student 8	Student 9	Student 10
GPA	4.00	4.00	4.00	3.45	4.00	3.90	4.00	4.00	3.60	3.81
Class Rank	1	1	1	38	1	12	1	1	53	32
Total Ranked	127	127	127	127	134	127	127	134	134	134

Non-CCP ESC Students GPA and Class Rank				
	Student 1	Student 2	Student 3	Student 4
GPA	3.21	4.00	3.52	2.79
Class Rank	72	1	59	86
Total Ranked	134	134	134	134

Cohen’s d score was used to review the academic performance differences between the non-CCP and CCP students. The results are presented in Table 12 in terms of Cohen’s d score effect size for GPA and class rank. The GPA and class rank of non-CCP students were found to

be lower than that of CCP students, with a Cohen's d score of -1.8060 for GPA and -1.7801 for class rank. These scores indicated a large effect size, suggesting that CCP students tend to have a higher GPA and class rank compared to their non-CCP peers.

Table 12

Cohen's d Score Non-CCP and CCP GPA and class rank

	Cohen d Score	Effect Size	
GPA	-1.8060	Large Effect Size	CCP Student Higher Mean Score
Class Rank	-1.7801	Large Effect Size	CCP Student Higher Mean Score

Note. Scores for Cohen d score 0.20 indicates a small effect, 0.50 indicates a medium effect and 0.80 indicates a large effect.

The ODHE reported a state average GPA range for high school CCP students in grades from 11th through 12th (3.30-3.37), which closely aligned with the GPAs of the CCP environmental science students in this study in grades 11th through 12th grade. Table 13 shows the CCP self-reported, actual and ODHE reported average GPA.

Table 13

Ohio Department of Education reported data on high school CCP GPA

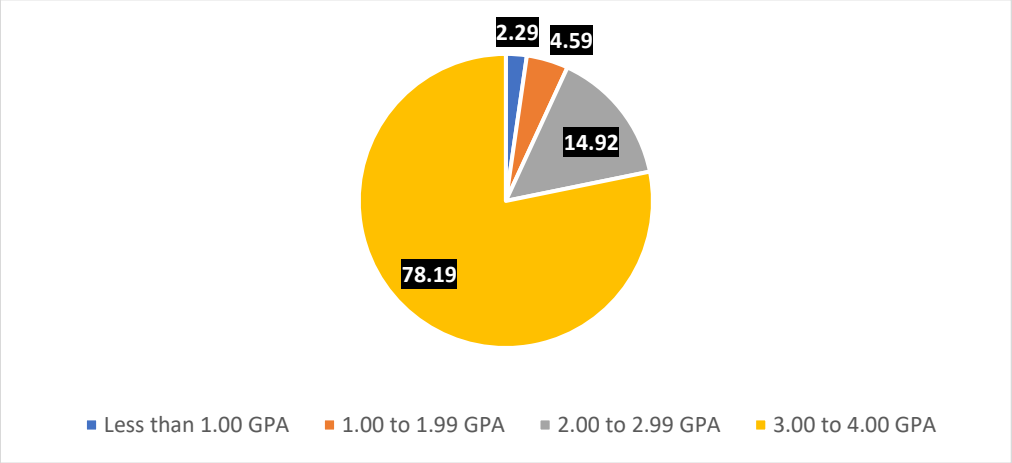
ESC CCP Student Self-**Reported** Demographic Survey	E.S.C CCP Student **Actual** GPA	ODOE Reported State Average GPA Grade Level CCP Participation
All Students Reported a GPA of 3.4 or Above	3.45-4.00 for 11th through 12th	3.30-3.37 for Grades 11th through 12th

GPA serves as a measure of academic performance, influencing college entrance and scholarship eligibility. Overall, the CCP participants in the research study demonstrated above-average academic performance compared to state-reported data. The majority of the CCP

environmental science students achieved a GPA of 3.4 or above. Below are Figures 22 and 23 for comparing state data of enrolled CCP student GPAs and ESC CCP students' GPAs.

Figure 22

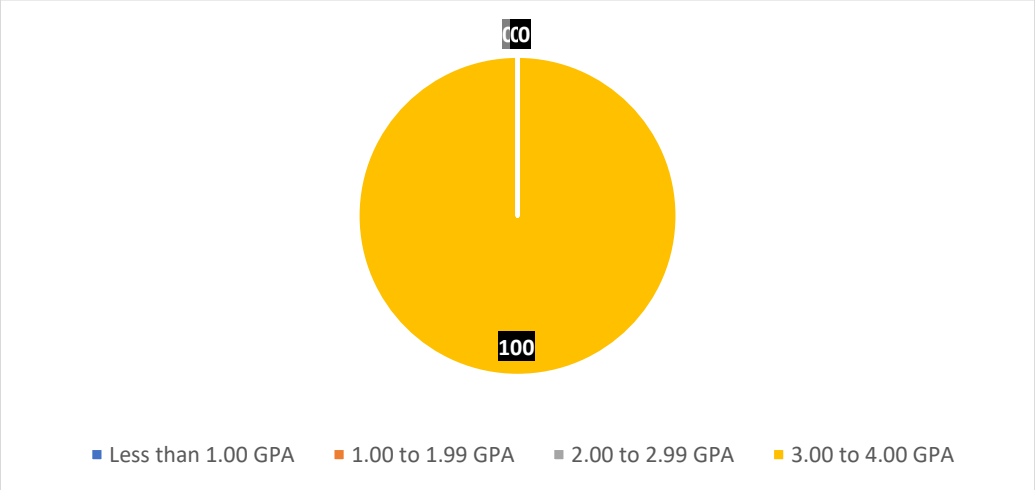
2022-2023 CCP State GPA Ranges



Note. Adopted from ODHE. (2024). CCP Annual Report 2022-2023. https://highered.ohio.gov/initiatives/access-acceleration/college-credit-plus/ccp

Figure 23

Environmental Science CCP GPA Ranges



Research Questions 3: ***What value do students perceive in participation in a College Credit Plus Environmental and Society course?***

To collect data for the third research question, the researcher conducted two semi-formal focus group interviews at the high school's library conference room during a 40-minute class session. The focus groups included both CCP and non-CCP participants. The findings were presented in the sequence of the interview questions and then evaluated and organized by theme. Then, the themes derived from the transcripts from focus group interviews underwent a structured analysis using Saldaña's two-cycle coding strategy, which helped condense data to identify repetitive patterns (Saldaña, 2013).

Subsequently, the data was sorted into themes based on coded categories. Initial and second-cycle coding was conducted for each question. Four demographic survey questions were used to help contextualize the interview findings and bolster the validity of the responses. The coding themes included:

1. Future Planning and Uncertainty
2. Relationships
3. Practical Considerations
4. Personal Development
5. Subject Interest and Value

These themes served to assess the data, providing insight into the perspectives and experiences of the participants. Further exploration of these themes were investigated in greater detail at the end of this section, providing a comprehensive examination of the research question.

Delving into perspective: Semi-Structured Focus Group Questions

Question 1

For the first interview question, "As a child, what did you want to be when you grew up? Why was that profession attractive to you?" the participants were asked about their childhood career aspirations and what profession they had found appealing as a child, which aimed to uncover the early influences and motivations behind their career choices.

The interview responses revealed a wide range of childhood career aspirations and influences. Several students expressed a desire to work with animals, teach, or pursue careers in aviation or agriculture. Other students were drawn to professions such as filmmaking, architecture, law, and healthcare. Some cited personal interests, family influences, or educational experiences that shaped their aspirations. One student expressed, “Honestly, I never wanted to do anything when I was younger. I never knew anything, what I wanted to do” or lacked a specific ambition during childhood.

The responses revealed several recurring themes. Students expressed interest in specific activities or roles, such as “I wanted to be a pilot in the Air Force” or “Work with animals,” demonstrating intrinsic motivation factors like wanting to help others. Another student stated, “As a child, I wanted to be a nurse because I wanted to help people.” Others were drawn to professions like teaching, as one student mentioned, “Teacher because I liked (still do) to help people learn.” Some aspirations were influenced by personal experiences or hobbies, such as participating in field trips, as indicated by one student, “We did the wax museum in fourth grade and I was Sandra Day O'Connor, I think. So I wanted to be a Supreme Court Justice,” or playing with Legos, as another student shared, “I wanted to be an architect. This was interesting to me because I loved Legos and building things.” Additionally, aspirations were sometimes driven by

perceived skills or qualities, such as being told one would be good at being a lawyer, as reflected in one student's statement, "Lawyer because I was told I would be good at it."

Question 2

For question two, "Why did you choose to participate in this environmental science course?" the responses from the students regarding their reasons for participating in the environmental science course were categorized into two distinct themes.

The predominant themes observed in the non-CCP group of responses were recommendation and familiarity. Examples such as "Sister took and said it was easy. Also she liked the teacher" and "I had a friend who is also taking the class and wanted a class we could take together" highlighted how these students were influenced by the experiences and recommendations of their peers or family members who had previously taken the course. The impact of individuals, such as teachers, was particularly notable, mentioned over 14 times, and the environmental instructor was specifically named six times. For instance, one student expressed, "I don't know exactly what I want to do. I know it's something in the science realm. I thought medical for a while, but with this and talking to Mr. Smith about what I possibly want to do, he's also given me the idea of something in environmental or something."

The CCP student responses revealed several recurring themes, including academic requirements, preference for course difficulty, and interest in environmental studies. Examples such as "It was college credit, a simpler class option, and I knew I liked the teacher" and "To qualify for my honors diploma" illustrated how students considered factors such as course difficulty, academic requirements for diplomas, and their interest in the subject matter when enrolling in the environmental science course. Moreover, the discussion regarding curriculum

restraints and teacher influence further underscored the various considerations influencing students' decision-making process for future investment and future goal attainment.

Course Discovery

Results from the survey regarding how students learned about the environmental science course revealed distinct patterns between CCP and non-CCP students, as depicted in Table 14. Various sources played a role in the CCP students' awareness of the course. Teachers and advisors/counselors emerged as significant sources of information, with multiple students citing these social networks. In contrast, non-CCP students primarily relied on friends and family for information about the course, indicating a more informal approach to selecting courses. One non-CCP student mentioned being placed in the course without prior knowledge, highlighting a lack of proactive behavior in seeking information.

Table 14

How CCP Environmental Science Students Learned about Course

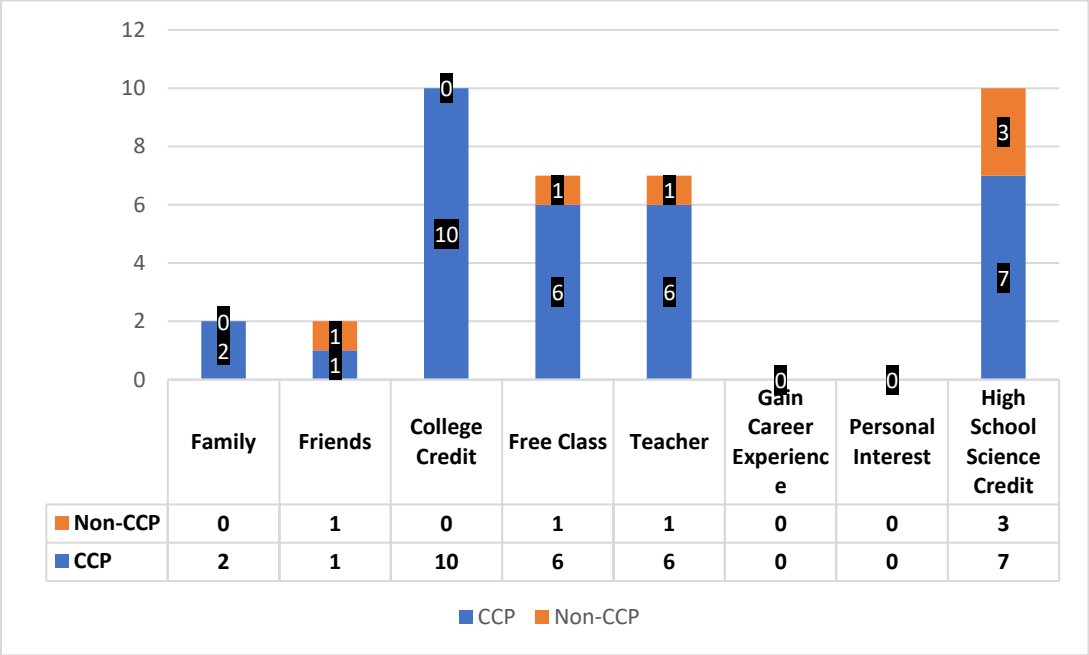
CCP - How did you find out about this course?	
Category	
Friends	1
Family	0
Teacher	3
Advisor/Counselor	6
Other	School schedule
Non-CCP - How did you find out about this course?	
Category	
Friends	2
Family	1
Teacher	1
Advisor/Counselor	1
Other	"They just put me in this course."

Self-Identified Influence

The participants were asked to indicate the factors influencing their decision to enroll in the environmental science course. The analysis of responses revealed distinct patterns among CCP and non-CCP students, depicted in Figure 24 below.

Figure 24

What were the influences on your decision to enroll in the Environmental Science Course?



	Family	Friends	College Credit	Free Class	Teacher	Gain Career Experience	Personal Interest	High School Science Credit
Non-CCP	0	1	0	1	1	0	0	3
CCP	2	1	10	6	6	0	0	7

Among CCP students, influences such as the opportunity to earn college credit, availability of a free class, and endorsement by teachers were predominantly cited. Additionally, a few CCP students mentioned family or friends' encouragement. In contrast, non-CCP students were less likely to cite external influences, with personal interest and high school science credit being the most commonly mentioned factors. Friends and teachers also played a role, albeit to a lesser extent, in influencing non-CCP students' enrollment decisions. Table 15 shows the individual student responses to the survey question.

Table 15

What were the influences on your decision to enroll in this course?

CCP Students Reply: What were influences on your decision to enroll in this course (check all that apply):	
Influence	
Family	2
Friends	1
College credit	10
Free class	6
Teacher	6
Gain career experience	0
Personal interest	0
High school science credit	7
Non-CCP Students Reply: What were influences on your decision to enroll in this course (check all that apply):	
Influence	
Family	0
Friends	1
College credit	0
Free class	1
Teacher	1
Gain career experience	0
Personal interest	0
High school science credit	3

Research Question 3

For question 3, "What topics or skills do you believe this course focused on the most?" the objective was to discern the perceived emphasis of the environmental course from the student's viewpoint. The researcher sought to uncover the main areas of focus within the course as identified by the students to understand how they perceive the content and objectives of the course, gaining insight into their learning experiences and priorities within the educational setting.

The non-CCP students strongly emphasized understanding the human impact on the environment. They wanted to comprehend how human actions influence ecological systems and expressed a commitment to addressing environmental issues. One student remarked, “I feel like

we haven't really talked about how much we as individuals make a difference. It's more of just like the problems that humanity as a whole has caused." Additionally, participants highlighted the concept of a symbiotic relationship with nature, indicating an appreciation for the interconnectedness between humans and the environment. Another student stated, "How we fit into how our planet works and how we can help it." Climate change emerged as a significant focus, with participants discussing its causes, effects, and potential solutions. Overall, the non-CCP students exhibited a heightened environmental awareness and emphasized the importance of environmental stewardship.

The CCP students shared similar sentiments regarding environmental awareness and conservation efforts. They, too, emphasized understanding human impact on the environment and strategies for environmental conservation. However, this group highlighted the course's role in developing organizational and study skills to support learning. One student explained, "Obviously, the environment and society, because that's the topic of the class, but also he tries to teach us study skills because the tests and quizzes are weighted more than a typical high school class. I have to focus more on doing well on the quizzes and tests, which for other classes it's whatever." Specific attention was given to climate change and ozone depletion, with one student stating, "Climate change and ozone depletion is a big part of it." indicating a focus on understanding environmental phenomena and related challenges. Additionally, discussions in this group included topics such as biodiversity and legal regulations. One student mentioned, "Legal side of the environment. How people fit into the climate narrative," suggesting an exploration of the complexities of environmental issues beyond the ecological aspect. Some participants also mentioned a focus on test and quiz skills, stating, "I think this course helps to

focus on organization to help learn," indicating an emphasis on academic assessment strategies alongside environmental education.

Both CCP and non-CCP students emphasized understanding the human impact on the environment and strategies for conservation. Non-CCP students highlighted environmental awareness, focusing on human influence, symbiotic relationships with nature, and climate change. CCP students echoed similar sentiments but also noted the course's role in developing organizational and study skills. The CCP students discussed climate change, biodiversity, legal regulations, and test-taking strategies, indicating a broader exploration of environmental complexities alongside academic skill development.

Question 4

For question 4, "What were you hoping to gain from taking the environmental science course?" the objective was to delve into the motivations and expectations of students enrolling in environmental science courses. The researcher sought to uncover the reasons students choose to study environmental science, providing insight into their perceived benefits, career aspirations, and attitudes toward environmental issues.

Different patterns emerged after comparing non-CCP and CCP students' responses regarding their motivations and intentions of what they hoped to gain from the course. The non-CCP students expressed a variety of intrinsic motivations, such as a desire to understand human interactions with the environment and learn about socio-political aspects related to environmental issues. Their responses indicated a curiosity about climate change and a general interest in gaining knowledge, although some participants admitted having no specific expectations from the course.

The CCP students predominantly cited extrinsic motivations, particularly related to academic and career goals. They emphasized the importance of earning college credits, with some participants specifically mentioning CCP credit as a primary objective. Additionally, the CCP students highlighted the perceived ease or difficulty of the course, with some viewing it as an opportunity for personal growth and others focusing solely on credit attainment.

While both groups shared a common interest in environmental topics, their motivations reflected different priorities, with non-CCP students leaning towards intrinsic curiosity and CCP students prioritizing external rewards such as college credit and career advancement. These distinctions highlighted the diverse perspectives and goals among students enrolled in environmental science courses, underscoring the need for tailored approaches to meet individual aspirations.

Perceptions of College

Upon reviewing the students' responses to the survey question, "Has your perception of college changed as a result of being in this environmental science course taught by a University of Findlay instructor?" Figure 25 depicts the shifts in student perception of college following the environmental science course. It was evident that perceptions varied among CCP and non-CCP students. Among the CCP students, there was a split, with half acknowledging that the course changed their perception of college, while the remaining half indicated no change. In contrast, a majority of non-CCP students, specifically three out of the four, reported a positive shift in their perception of college due to their participation in the course.

This shift in perception was closely related to the motivations and expectations expressed by non-CCP students when asked about their reasons for taking the environmental science course. They demonstrated intrinsic motivations, such as curiosity about human interactions with

the environment and interest in the socio-political aspects of environmental issues. In their responses, they expressed a desire to understand climate change and gain knowledge about environmental topics.

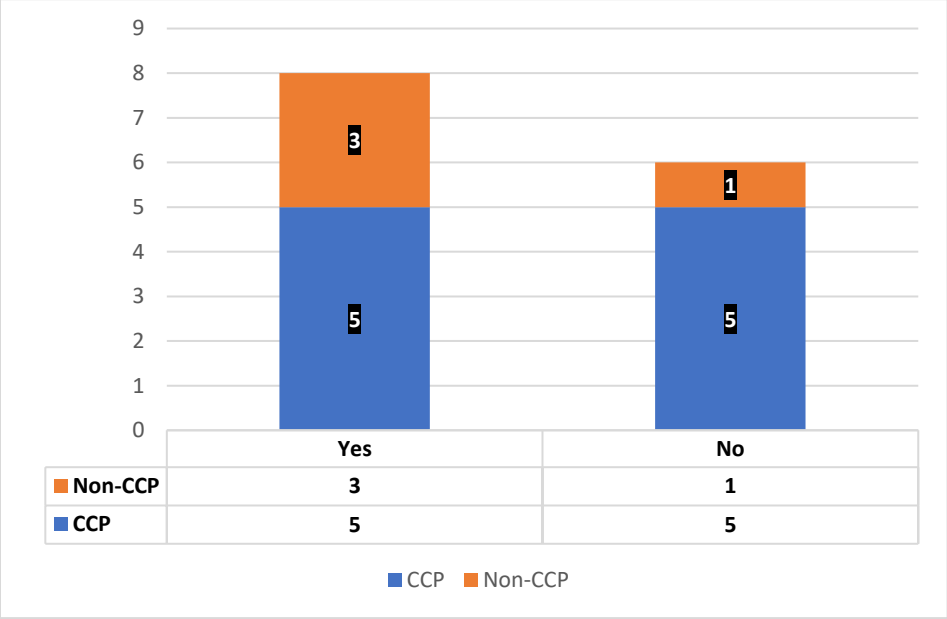
Non-CCP students also appreciated the teaching approach in the course, particularly the autonomy given to them for perhaps the first time in a college-level setting. One student noted:

> Yeah. We do a lot of kind of like on your own work, which I really enjoy. We have a lot of in-class lectures... I like how some teachers or some other classes will just be like the same thing every day. Math classes can be very repetitive, but this class changes a lot, like projects and lecture days and then worksheets we'll do or videos to watch, and it's multifaceted.

On the other hand, CCP students who had previous experience with college courses predominantly cited extrinsic motivations, particularly those related to academic and career goals. They emphasized the importance of earning college credits and viewed the course to advance academic and career pursuits. Their prior exposure to college courses may have affected their perception, which remained unchanged. The analysis of students' perceptions of college following their participation in the environmental science course revealed varying responses between CCP and non-CCP students. While CCP students showed a split in their perception change, non-CCP students primarily reported a positive shift. This change in perception was closely tied to the intrinsic motivations expressed by non-CCP students. Additionally, non-CCP students valued the autonomy provided by the course, which was a new experience for all of them to participate in a college-level environment. Conversely, CCP students who had previous exposure to college coursework showed less of a shift toward changing their perception of college.

Figure 25

Shifts in Student Perception of College Following the Environmental Course



Question 5

Question 5, "Have you gained what you expected so far? Why or why not?" aimed to assess students' satisfaction and fulfillment with their expectations from the environmental science course. The responses provided valuable insights into the alignment between students' anticipated outcomes and their actual experiences in the course.

The non-CCP students predominantly focused on satisfaction with the course content and learning experience. They expressed appreciation for being informed about various environmental topics and noted that they had gained more knowledge than expected. However, there was also a desire for more emphasis on individual impact, suggesting a desire for deeper exploration of personal contributions to environmental conservation.

The CCP students' responses highlighted a broader range of experiences and perspectives. While some expressed satisfaction with the course and appreciation for the

teacher's approach to facilitating understanding, stating, “It feels more like with the class we're talking with each other, not at each other,” others expressed a desire for more actionable steps and discussions on practical actions in addressing the environment. The CCP group emphasized the importance of learning about environmental issues and understanding how to make a difference and take meaningful action. One student articulated, “I kind of wish we focused more on like actions we can take, like protesting against big corporations that are actually making the differences and showing us how we can do that would be a really cool side of it.” Additionally, the course's value is recognized in prompting consideration of environmental career paths, as one student expressed that, “I have now considered something environmental as a future career” and acknowledgment of gaining college course credits as a benefit.

Both groups expressed satisfaction with the dynamic and engaging nature of the environmental science class, appreciating the varied instructional methods such as presentations and research projects. While non-CCP students focused more on the learning content and individual impact, CCP students considered broader perspectives, including career paths and desires for more actionable discussions. These insights underscored the importance of addressing diverse student expectations and including a balance between imparting knowledge and fostering practical skills for environmental stewardship.

Question 6

For question 6, "Do you think other high school students would enjoy this class? Why or why not?" This approach aimed to elicit insights into the class's perceived value and potential enjoyment among a broader high school audience.

Non-CCP students identified several aspects of the environmental science class that they believed would be enjoyable for other high school students. They emphasized the engaging

structure of the class and how it fostered active learning among students. One student noted, “If you do not like hands-on work, this class may not be the most fun.” They also acknowledged potential concerns, such as the stress associated with tests being weighted heavily and the demanding workload, expressing, “I feel like it is a little more difficult than I thought it would be going into it. The test and quizzes are such a large percent of our grade …I feel like going into it, I wish I had known that…” Despite these challenges, they highlighted the importance of developing good study habits and the value of hands-on learning experiences. They expressed confidence that students who enjoyed learning about the earth and were willing to put in effort would have found the class enjoyable, stating, “I think if you enjoy learning about the Earth, they would enjoy this class.”

CCP students highlighted the positive aspects of the class, such as learning about environmental issues and the teacher's effectiveness in preparing students for exams. One CCP student expressed that the course was test-heavy, but “It's led for me at least to learn better study tactics for other classes that I can use for all of my classes now.” They also emphasized the importance of engaging topics and the overall value of the class in educating students about interactions in the world around them. For example, one CCP student expressed, “I think high school students would enjoy this class because we learn about the interactions in the world around us and I think that it is very important. Pair this with a teacher who engages the class and it becomes very fun.” While they acknowledged the class's engaging nature, they also noted its difficulty level and the potential challenges for students who struggle with test-taking. Examples include, “Yes, I feel like it is an engaging class, but it is more difficult than I thought,” and “I was prepared for this to be a really easy credit” and “If people enjoy individual work they will like this class if they are not good at test taking then they might not want to take this course.”

Despite these concerns, they expressed overall satisfaction with the class and believed that other students would find it enjoyable and valuable.

In reviewing the students' responses to the survey question, "Would you recommend the Environmental Science course to other high school students?" where students were provided with options to choose yes, no, and maybe, distinct patterns emerged. Figure 26 indicated that among CCP students, 6 of 10 selected yes, three opted for maybe, and one chose no. Conversely, among four non-CCP students, three indicated yes, while one responded with maybe, as indicated by Figure 27.

The non-CCP and CCP students expressed positive perceptions of the environmental science course, citing engaging topics, effective teaching, and the opportunity to learn about environmental interactions. However, a difference emerged in their considerations of the course's difficulty level and emphasis on individual work and test-taking skills. Non-CCP students appeared to have more reservations about these aspects, with one mentioning, "I feel like it is a little more difficult than I thought it would be." Meanwhile, CCP students emphasized the value of the course in preparing them for exams and quizzes, with one stating, "Our teacher prepares us well." Despite this difference, both groups agreed on the enjoyment and overall benefit of the course for other high school students.

Figure 26

CCP Response: Recommend Environmental Science Course

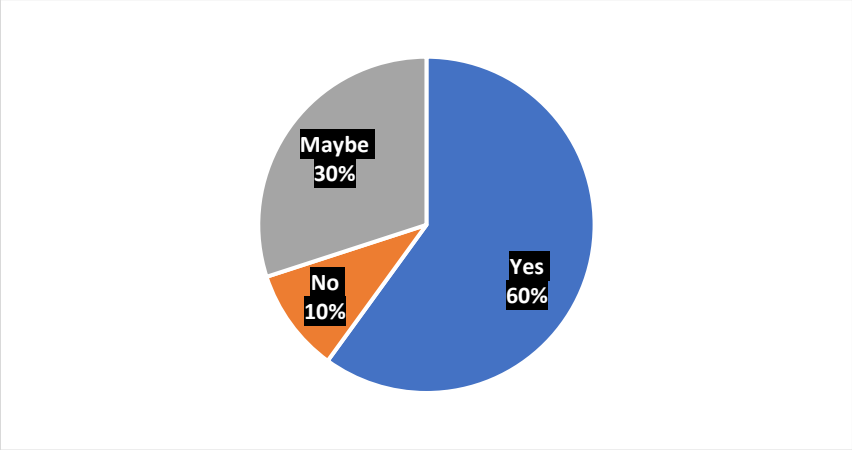
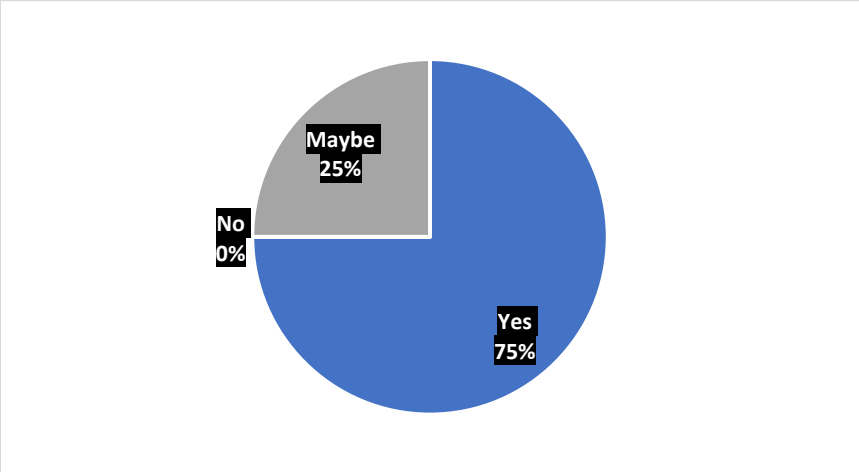


Figure 27

Non-CCP Response: Recommend *Environmental Science Course*



Question 7

For question 7, students were asked to consider, "If you had the opportunity as a CCP student to attain an Occupational Safety and Health Administration (OSHA) Management Certification, would you consider enrolling?" Before providing their responses, students were presented with a description of the course, outlining its objectives and relevance to various career paths. The course description can be referenced in Appendix D, which contains the focus group

semi-structured questions. The description highlights the course's focus on teaching safety protocols for handling hazardous chemicals, its coverage of topics such as Hazardous Waste Operations and Emergency Response, and its applicability to environmental contractors, consultants, and other professionals working in hazardous waste sites. With this context in mind, participants were asked to articulate their reasons for considering or not considering enrollment in the course.

The non-CCP students (Figure 28) primarily emphasized the potential benefits of the course for expanding job opportunities and addressing environmental disasters. Despite some reservations about direct relevance to their intended career paths, they acknowledged the value of the certification for enhancing their skill set and professional versatility. One student stated, “I think I would not, as it would not directly benefit me, but it would be worth it to consider.” Another expressed, “Yes, because even though I'm not rethinking my career, it may help out with job opportunities between now and my degree-level profession.” Additionally, the non-CCP students expressed openness to the idea of enrolling in the course if they found it personally interesting or if they perceived it as beneficial for their future endeavors.

Among CCP students (Figure 29), six stated a definite no, with one expressing uncertainty. In contrast, the CCP students exhibited a more skeptical outlook towards enrolling in the course. They largely cited a lack of personal interest or perceived relevance to their career goals as reasons for hesitation. One student mentioned, “I would not just because this certification would not get me ahead in my intended field of study.” Some students expressed outright disinterest in the subject matter or skepticism about the course's potential benefits for chosen career paths. For example, one student stated, “No, because that information would not apply to my life.” and “No, I am not very interested in this stuff.”

The data indicated that both non-CCP and CCP students recognized the potential value of the OSHA Management Certification course. However, their perspectives varied based on factors such as personal interests, career aspirations, and perceived relevance to their professional goals. Non-CCP students were more inclined to consider the course, focusing on its broader benefits and potential for skill enhancement, while CCP students were more skeptical and focused more on the course's direct alignment with their career trajectories and personal interests. The major theme noted revolved around career relevance, personal interest, and perceived course value. Two of the four non-CCP students expressed definite interest, while one indicated a possibility of consideration.

Figure 28

Non-CCP Interest in OSHA Management Certificate Through CCP

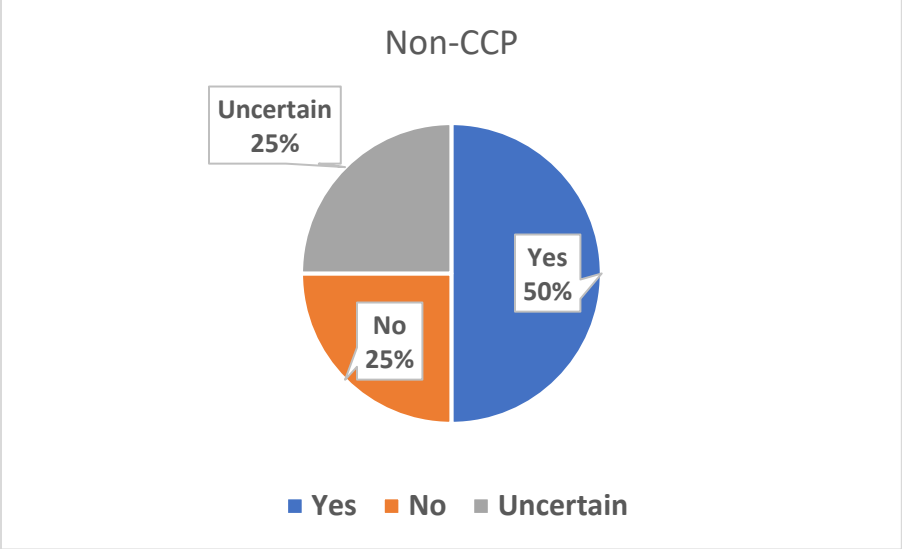
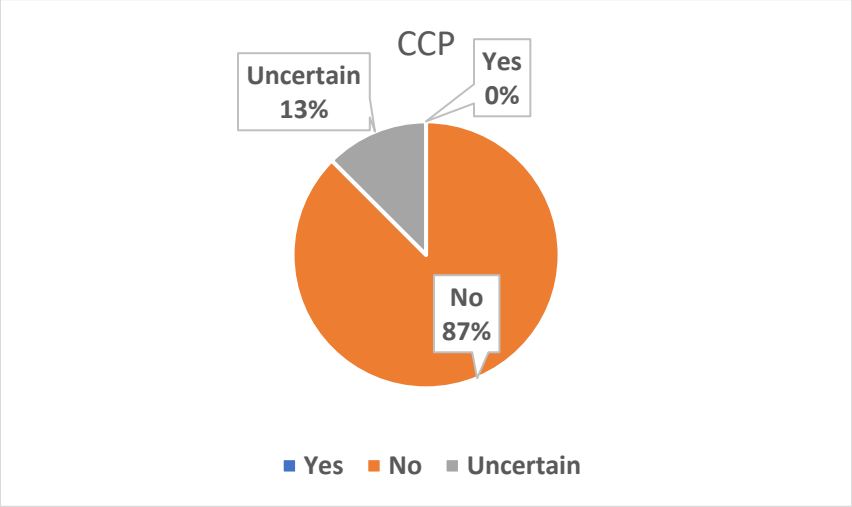


Figure 29

CCP Interest in OSHA Management Certificate Through CCP



Question 8

Question 8, "Is there any advantage(s) you believe you have gained compared to your peers by participating in this course?" sought to gain perceived benefits or advantages that the students attributed to their participation in the course. The question aimed to uncover the relevance of the course to the students' academic and personal development to help assess the perceived value and impact from the students' perspective.

The non-CCP students expressed several advantages gained from participating in the environmental science course. They highlighted the significance of understanding the collective impact on the Earth, indicating a heightened awareness of the environmental issues and their broader implications. One student explained, "…I feel that there are many parts of the class itself that better prepare us for the world." Moreover, they noted that the course better prepared them for the future by equipping them with valuable knowledge and skills applicable beyond the classroom. The hands-on learning approach employed in the course was particularly noteworthy, as it provided students with practical experience and insight into college-level instruction. As one

student stated, “There is more hands-on work and gives college format knowledge. Seems more fun than other classes. They aren't just drilling information into you.” This interactive approach was viewed as more engaging and effective compared to traditional teaching methods. Additionally, students appreciated how the course mirrored the format and expectations of college classes, offering them valuable exposure to what higher education entails. One student expressed, “I think the fact that they show what college is going to somewhat be like.”

The CCP students also identified several advantages resulting from their participation in the environmental science course. Firstly, they appreciated the opportunity to earn college credit while still in high school, recognizing it as a valuable step toward their academic goals. Additionally, they emphasized feeling more prepared for college courses, attributing this readiness to the course's format and content. One student stated, “… this class is set up more like college, so I know what to expect in the future.” Moreover, students noted that the course deepened their understanding of environmental concepts, providing valuable knowledge extending beyond the classroom. For example, one student explained, “We have a general idea of how our environment functions.” They also highlighted the course's resemblance to college-level instruction, as one student states, “When we get to college, people who haven't taken classes like this aren't going to be prepared for how the tests are weighted…” The CCP students acknowledge the financial benefits of earning college credits, explaining they “…saved money and gotten college credits and yeah learned more about the environment.”

Despite some variations in emphasis, both CCP and non-CCP participants recognized numerous advantages of participating in the environmental science course. These included enhanced college readiness, acquisition of knowledge and skills, and a deeper understanding of environmental issues. While non-CCP students emphasized engagement and departure from

traditional high school teaching methods, noting the interactive nature of the class where lectures were fewer and students were expected to engage in activities like working on research and case studies. One student highlighted, “I feel the course helps me to be more engaged in the class and more responsible for my own learning and grade because I can't just blindly fill out the guided notes. I have to actually pay attention.” Another student mentioned, “It's not like bullet points like this word and that. He talks it through the whole process and leaves it up to you what to write and what not to write…rather than having you hand-held through it all.” This departure from traditional high school teaching methods was seen as engaging and helped students take responsibility for their own learning.

CCP students highlighted the course's alignment with college expectations, particularly in terms of difficulty level and independent learning. One student mentioned, “I feel it helps me to be more engaged in the class and more responsible for my own learning and grade because I can't just blindly fill out the guided notes. I have to actually pay attention.” Another student highlighted the contrast between CCP and non-CCP classes, stating, “The CCP ones are pretty difficult and if they're not as difficult, I feel like the high school classes that aren't worth CCP credit, they hold your hand through the whole class. They're baby-stepping us through it.” The students recognized the course’s effectiveness in preparing them for higher education, focusing on engagement, departure from traditional teaching methods, and aligning with college expectations.

Question 9

Question 9, "What type of job or career are you hoping to have several years from now?" aimed to gain insights into the career aspirations and motivations of the students. The subset question, "What interests you about that job or career?" was intended to delve into the students'

interests and motivations behind their chosen career paths and understand the factors influencing their career choices.

The data suggested that CCP students might have had greater exposure to various career paths influenced by educational experiences, family backgrounds, and personal interests, which could have accounted for these observed differences between the two groups. For instance, one CCP student expressed aspirations of becoming a Certified Public Accountant, citing a passion for mathematics and organization, which influenced her decision to enter the field, stating, “Both my parents are accountants.” Similarly, another CCP student expressed interest in financial advising, inspired by his father's work in the profession. The influence of the CCP students who selected nursing or the film industry for their future career path is unclear, but these two students both stated that when they were younger, these were the fields they were interested. The one non-CCP student who wanted to be a teacher shared that he aimed to fulfill his father's dream of becoming a teacher, stating, “My dad originally went to college to be a high school history teacher but dropped out halfway through and I feel like my want to teach is in part to try to continue that of getting to where my dad couldn't.”

These insights highlighted the importance of exposure and career exploration facilitated by educational programs and familial influence in shaping students’ career aspirations. Two undecided students, one from the non-CCP group, expressed, “I am not entirely sure, though may consider something that involves the environment…” and another from the CCP group stated, “Something in the science field like medical or environmental or something.” Both students who were undecided about a future career expressed interest in environmental science, indicating a potential shift in career interests.

Question 10

Question 10, "What skills or knowledge do you think would be most important for someone pursuing the career you are interested in?" aimed to gain insights into the perceived requirements of students regarding their desired careers. The researcher planned to gain an understanding of the specific skills, knowledge and competencies that students believed were essential for success in their chosen fields.

In the non-CCP cohort, students highlighted the significance of critical thinking, communication skills, attention to detail, and knowledge in the scientific field for careers such as teaching biology or environmental science. One non-CCP student also emphasized the importance of childcare skills and CPR training for professionals working with children.

The CCP students, particularly those interested in accounting, medical, environmental, or business management fields, emphasized the importance of math skills, organization, knowledge of anatomy, medical terminology, and leadership abilities. They also stressed the significance of language skills, commitment, social skills, caring attributes, and critical thinking for success in their chosen careers. While both groups recognized the importance of foundational skills, such as critical thinking and communication, the non-CCP students focused more on the specific requirements of their chosen fields. Meanwhile, the CCP students emphasized a broader range of skills applicable across various professional domains.

Question 11

Question 11," Can you provide an example of how you believe this course could be useful in your future career or education pursuits?" was intended to gauge the perceived practical relevance and potential application of the course content in students' future endeavors. The aim

was to understand how students envisioned integrating the knowledge, skills, and experiences gained from the course into their professional or educational paths.

The non-CCP students primarily focused on the potential educational benefits of the course, particularly in terms of gaining background knowledge on environmental issues and preparing for college. Students expressed varying levels of enthusiasm regarding the course's relevance to their future careers. One student who planned to become an English teacher indicated its potential usefulness, stating, “Many different topics in literature try to attack the issues of the environment, but it (the course) can help me fit the pieces into teaching and better understand the topics.” Another student expressed a desire to make an impact in environmental fields, saying, “If I were to go into something involving the environment or making some kind of impact, this class would be very beneficial.” However, one student expressed skepticism about its applicability, stating, “I don't think this would bring anything useful to my future career.”

The CCP students strongly emphasized the practical applications of the course content in their future careers or education pursuits. Students highlighted the value of gaining a head start in college, improving their test-taking abilities, and acquiring knowledge that could enhance their professional prospects, such as understanding ecosystem dynamics and climate issues. The CCP students displayed a more proactive approach to linking the course material to their future goals, envisioning how the knowledge gained could directly benefit their career path.

Value in Participation

In exploring the perceptions and motivations of students enrolled in the CCP Environmental course, students provided insight into the various factors influencing their decision to participate. The interaction of internal and external motivations played a key role in driving student engagement, helping to clarify the reasons behind their educational experience

and goals. By analyzing the data from the focus group interviews, the researcher gained insight into the value students derived, providing insights into personal growth, practical considerations, and subject interest in science education. It is important to note that these aspects are listed in no particular order.

Future Planning and Uncertainty

The students perceived significant value in participating in the environmental science course in terms of future planning in addressing uncertainties. One non-CCP student remarked, "I think the fact that they show what college is going to somewhat be like." Similarly, a CCP student expressed, "You are more prepared for how college courses work, and you get the college credit from it." Another stated, "That this class it set up more like college, so I know what to expect in the future." Furthermore, the opportunity to earn college credit emerged as an essential motivating factor for students, providing a pathway for advancing their academic pursuits and potentially saving time and money in future higher education endeavors. As one CCP student noted, "You saved money and gotten college credits," while another said, "I have a college course done."

Additionally, students expressed a keen interest in leveraging their participation in the course to increase their GPA or earn an honors diploma, reflecting their aspirations for academic achievement and recognition. This dual benefit of academic advancement and recognition contributed to students' strategic planning for their educational trajectory. By capitalizing on the college credit offered through the course, students not only saved on future tuition costs but also expedited their progress toward degree attainment. One CCP student stated their motivation for the course as, "College credit as well as another possible option for what I want to do. "Another student expressed, "I knew I wanted the college credit, but I also know I want to go into

something in the science field. I'm just not sure where." Participation in the environmental science course addressed academic goals and offered a strategic approach for long-term educational and career aspirations, mitigating uncertainties associated with future academic endeavors.

Relationships

The interviews provided insights into how relationships, particularly those with teachers and peers, influenced students' decisions and perceptions regarding the environmental science course. Students articulated how their interactions with an educator profoundly influenced their interest in environmental science studies and potential career paths. For instance, one CCP student expressed, "I don't know exactly what I want to do… but with this and talking to Mr. Smith… He's kind of also given me the idea of something in environmental [science]." This illustrates the guiding influence teachers can have in steering students towards specific career paths.

Moreover, students highlighted the significance of peer recommendations and the influence of a supportive learning environment. As one non-CCP student mentioned, "My sister took [the environmental course] and said it was easy; she also said she liked the teacher." Another non-CCP student echoed this sentiment, stating, "I had a friend who is also taking the class and wanted a class we could take together." These quotes underscore the importance of peer connections in influencing students' enrollment decisions.

Furthermore, students recognized educators as invaluable sources of information when considering enrollment. Additionally, students cited teachers as significant sources of course information, relying on their guidance and recommendations when making decisions about

course enrollment. A student elaborated, “I’m doing science fair this year…he’s helping me a lot with the more complicated side of things. Whenever I need help, he’s willing to help us in class.”

During the focus group interview students elaborated on the influential role of supportive relationships, emphasizing the value they bring to the learning process. One student commented, “He’s excited when he talks, which is so engaging. When you have a teacher who knows what they’re talking about and makes you want to learn, it makes all the difference.” A student remarked, “…I love him,” and another, “He’s very good at breaking stuff down so we all understand, he doesn’t move on without us knowing what we’re talking about.” These comments highlight the positive influence of passionate and dedicated teachers on students’ engagement and learning experiences, demonstrating the importance of fostering trust and a strong teacher-student relationship.

Practical Considerations

The investigation uncovered that practical factors were influential in shaping students’ views on the environmental science course’s value. Some students cited career aspirations and related fields, suggesting that the course could fulfill requirements for their future academic or career paths. As one student remarked, “It’s a college credit, Mr. Smith is a really good teacher,” highlighting the dual benefit of gaining academic credit while appreciating the quality of instruction. Furthermore, several students mentioned enrolling in the course to meet specific academic requirements. For example, one student stated, “To qualify for an honors diploma, you have to have four credits of science, and I already took anatomy last year, so this would've been my fourth science,” illustrating the strategic planning involved in course selection. One CCP student, who planned to major in Business in college, stated, “I feel like a lot of companies are very big on going green nowadays because it's what the consumer wants. So, having the

background information going into companies, maybe I can do something more centered on their approach to climate change and show consumers the efforts they're making."

For one student, community involvement served as a practical consideration in their decision to enroll in the environmental science course. The student remarked," I'm also really interested in climate change initiatives and like taking action within the community." By engaging in climate change initiatives and taking action within their community, they recognized the relevance of the course material to real-world challenges and saw the opportunity to make a positive impact. This community involvement aspect further enhanced the course's perceived value beyond academic requirements and career aspirations.

Others emphasized the importance of gaining college credits and expanding their knowledge base. One student mentioned, "For Findlay, I'm attending there in the fall and this is one of the courses that's like part of the requirement. So I'm taking it for college credit," underscoring the practical advantage of gaining academic credits ahead of college enrollment. Moreover, students recognized the potential professional benefits of environmental science knowledge. A CCP student expressed, "Knowing about climate issues and being able to improve companies because of that," indicating a proactive approach to addressing real-world challenges.

Additionally, many students perceived the course as an easy credit, allowing them to manage their workload effectively and focus on other interests. One student commented, "I just wanted an easy science. This is also my fourth science credit. I just wanted an easy class so I could focus on other stuff," demonstrating a pragmatic approach to course selection. Furthermore, scheduling issues were mentioned, with some students indicating that the course fit better into their schedule compared to other options or was the only option they were given. These highlighted practical constraints students faced when choosing courses. These results

suggest that while intrinsic motivation, such as personal interest, was present, practical considerations related to requirements, scheduling, and perceived course difficulty also played a considerable influence on shaping students' perceptions of the course's value.

Personal Development

Results from the study indicated that students perceived the environmental science course as facilitating personal development in various ways. Both CCP and non-CCP students mentioned the opportunity to experience college-level coursework as a valuable aspect of participating in the course, providing them with a glimpse into higher education's academic rigor and expectations. One non-CCP student expressed, "I appreciate how the course provides a glimpse into what college is going to somewhat be like." Additionally, students expressed that the course challenged them intellectually, particularly in understanding complex environmental concepts such as climate change and biodiversity. This challenge contributed to their growth by providing opportunities to enhance their critical thinking and problem-solving skills. A student reflected on this, saying, "The way that we have the assessments, with the 80/20 grading scale, make it so we have to actually study, and it's led for me at least to learn better study tactics for other classes." Another CCP student stated, "I have gained experience on keeping myself on track to get work done."

Moreover, several students mentioned that participating in the course boosted their confidence in being able to successfully navigate the college academic environment and gain a deeper understanding of environmental issues. One student highlighted, "This class has helped me with my test-taking ability. It's not like bullet points like this word and that. He's, like, talks it through and goes through the whole process and leaves it up to you to what to write and what not to write and really helps you learn that way of note taking and stuff rather than having you hand-

held it all." Additionally, students perceived the course as preparing them for future academic endeavors. They recognized the advantage of gaining college credits and deepening their knowledge of environmental science. One student expressed, "The CCP ones are pretty difficult and if they're not as difficult, I feel like the high school classes that aren't worth CCP credit, they hold your hand through the whole class. They're baby-stepping us through it." Another student explained, "I think the way he lectures is similar to college. How he talks more than just writes everything down or speaks just from a PowerPoint."

Overall, the findings suggest that the environmental science course served as a platform for both the non-CCP and CCP students to experience college, gain confidence in their abilities, and confront academic challenges, thereby fostering their personal development. As one student noted, "You are more prepared for how college courses work," indicating the course's effectiveness in bridging the gap between high school and college expectations. Another student emphasized, "I have gained from this course the deepening of knowledge that I have had prior to this class," highlighting the course's role in expanding their understanding of environmental science concepts. Additionally, students expressed how the course promoted active learning and personal responsibility, with one student stating, "I feel it helps me to be more engaged in the class and more responsible for my own learning and grade because I can't just blindly fill out the guided notes. I have to actually pay attention." Furthermore, some students contrasted the environmental science course with traditional high school classes, noting, "I feel like the high school classes that aren't worth CCP credit, they hold your hand through the whole class. They're baby-stepping us through it," suggesting that the course challenged them to take more ownership of their learning. Others reflected on their initial motivations for taking the course, with one

student expressing, “I hoped it would further my knowledge on the environment and how to help it,” demonstrating their desire for personal and intellectual growth.

Subject Interest

The non-CCP and CCP students expressed enthusiasm for the environmental science course, primarily drawn by the course’s relevance to their lives and the engaging teaching style of their instructor. Despite any preconceived notions students may have had prior to enrolling, all found the subject matter fascinating and pertinent to the world around them. While not all students were initially enthusiastic about enrolling in the course, they expressed genuine appreciation for the knowledge and relevance of the material and its impact on their lives. These findings highlighted the significance of subject relevance and engagement in driving interest and participation in academic endeavors. Furthermore, students who were previously undecided on their career trajectory contemplated environmental science as a potential path, inspired by the interest and relevance they found in the course material.

Several students highlighted their attraction to the subject matter, with one non-CCP student stating, “I love the idea of learning about Earth, how we affect the Earth, and how we can help the Earth thrive.” Additionally, students appreciated the contrast between the environmental science course and other science courses, with one student remarking, “I didn't want to take Physics,” and another expressing, “I didn’t want to take Chemistry.” Another student added, ”Coming from someone who took the chemistry class last year, this is so much better.” One student wanted to build on previous science interests with this course, stating, “I liked taking biology, and this is... A lot of the stuff in here and environmental is similar to biology, and I didn't wanna take any other classes.”

Moreover, students emphasized the engaging nature of the class, noting the teacher's ability to prepare them well for exams and quizzes and the diverse and interesting topics covered. They appreciated the interactive and multifaceted approach to learning, where they could engage in discussions, make presentations, and collaborate with peers. One student expressed, "We do a lot of our own work, which I really enjoy."

Additionally, comments from students emphasized the real-world relevance of the course content. One CCP student stated, "I think high school students would enjoy this class because we learn about the interactions in the world around us, and I think that it is very important. Pair this with a teacher who engages the class, and it becomes very fun." Another student mentioned, "Yes, the topics are interesting in diverse ways," highlighting the broad appeal of the subject matter. These comments further demonstrate the positive impact of engaging teaching methods and relevant course content on students' interest and enthusiasm.

Summary

In this chapter, the researcher explored the self-determination of CCP students, compared them to a similar dual enrollment population, and examined the value these students found in the environmental science course. Understanding the pre-college experiences of dual enrollment students was instrumental in helping them acquire post-secondary credentials, which was essential for navigating the knowledge-based economy where a high school diploma might fall short.

The pre-college experiences of CCP students encompassed various facets, including enrollment decisions, academic readiness and proficiency, familial and peer support, motivation to learn, and demographic factors such as gender and socioeconomic status. These aspects collectively shaped students' identities and actions prior to embarking on their post-secondary

education journey. This chapter consolidated the insights garnered from the exploration of self-determination among students enrolled in CCP, conducted a comparative analysis with other student cohorts, and highlighted the significance of enrollment in the environmental science course as a cornerstone of their pre-college experiences and self-directed aspirations.

The key findings that emerged from this chapter underscored the intricate interplay between student background characteristics and pre-college experiences, which influenced self-determination, goal-setting, and the potential for academic success. Understanding these factors and how they interacted with each other offered valuable insights that could help better prepare students for success in their post-secondary pursuits. Students from marginalized or at-risk backgrounds face extra hurdles, but participating in high school activities, engaging in programs and practices aimed at enrichment, and developing self-determined goals could promote and help alleviate some of these challenges. Delving into the motivations that drove students' self-selection of courses revealed that course enrollment was shaped by a combination of intrinsic and extrinsic factors, including classroom experiences and the perceived value of the course.

Self-Determination

The study utilized the AIR Self-Determination Scale to investigate the self-determination factors driving high school students to enroll in a CCP environmental society course. The findings revealed that CCP students generally exhibited higher levels of self-determination compared to non-CCP students, with disparities apparent early on in perceptions of capabilities and opportunities. Additionally, CCP students displayed a stronger focus on future-oriented aspirations. In comparison, non-CCP students prioritized immediate academic achievements. Despite both groups expressing confidence and scholarship opportunities, CCP students had limited awareness of financial aid and apprenticeship opportunities. Post-secondary aspirations

differed slightly, with the majority of CCP students intending to attend college, while non-CCP students were more inclined towards immediate workforce entry. Moreover, a higher proportion of CCP students had siblings attending college, potentially influencing their academic aspirations and self-determination levels. These findings underscored the complex interplay of various factors shaping high school students' decisions to participate in CCP coursework and their subsequent self-determination levels.

CCP students

The data compared factors influencing the CCP environmental science course students with typical dual enrollment students participating in Ohio's CCP program. It mirrored statewide trends in enrollment patterns, in CCP with notable gender disparities in female participation. While most students were not economically disadvantaged, their course preferences differed slightly from statewide trends. Despite these variances, academic achievement among the CCP environmental science students remained high, emphasizing the need for equitable access to educational opportunities.

Value

Students recognized the course's value for future planning, academic achievement, and personal development. Relationships with teachers and peers, along with practical considerations like meeting requirements and engaging subject matter, contributed to their enthusiasm. Importantly, students found the course relevant to their lives and inspiring, even influencing those initially undecided about their career paths. The data emphasized the importance of engaging instruction and subject relevance in driving students' interest and participation in environmental science education.

Chapter V. Conclusions and Recommendations

This chapter further delves into the findings and implications of the study, exploring the interest, value, and self-determination perceived by high school students in a dual enrollment environmental science course. It integrates this study's findings with existing literature on CCP and student motivation. Additionally, the chapter evaluates the strengths and limitations of the study, illuminating factors that could impact future research endeavors. Furthermore, the chapter proposes research recommendations to enhance the understanding of postsecondary goals and aspirations. Drawing from Yin's (2016) assertion that research extends beyond data analysis to interpret findings and draw overarching conclusions, this chapter aims to synthesize the study's outcomes and contribute to the broader discourse on dual enrollment.

Review of the Study

This study aims to identify and understand factors that motivate and influence high school students' decisions to participate in a high school-based environmental science dual enrollment course. Despite the increasing participation in dual enrollment programs, little was known about the decision-making process that high school students undergo when selecting their courses (Jenkins & Fink, 2020; Taie & Lewis, 2020). The researcher uses motivational theories as a framework to evaluate the dimensions of autonomy, interest, and competence (or self-efficacy), with self-determination serving as the conceptual framework for assessing these factors (Murray, 2011; Ryan & Deci, 2017). To provide insight into the factors influencing individual course choices, the researcher sought to identify the students' values in the course. These values may enable students to build on their interests and passions and apply the subject material to their future lives to understand the motivating factors behind dual enrollment pathway opportunities, particularly from the perspective of the students.

The research was guided by three main questions, which steered the analysis for participation in College Credit Plus coursework:

1. What self-determined interests motivated high school students' decision to participate in a College Credit Plus Environmental and Society course?
2. How do the factors influencing the College Credit Plus Environmental and Society students compare to those influencing the typical dual enrollment student decision to participate in dual enrollment?
3. What value do students perceive in participation in a College Credit Plus Environmental and Society course?

The study utilized a mixed methods approach, incorporating various data collection techniques to investigate the perceptions and motivations of environmental science students taught by a University of Findlay instructor. Quantitative research data was collected through the AIR Self-Determination Scale survey and demographic information, which was analyzed using the Wilcoxon rank-sum score and Cohen's d scoring tests to compare differences in the distribution of values within the CCP and non-CCP groups. Furthermore, comparative statistics were employed to contextualize the findings with the Ohio Department of Higher Education and Ohio Department of Workforce Development data. Qualitative insights were obtained through semi-structured focus group interviews, with open-ended responses analyzed using Saldana's (2013) two-cycle coding method to identify emergent themes. This approach facilitated a detailed comprehension to gain an overall understanding of the factors influencing students' perceptions and motivations for participation in the environmental and society course.

Based on the study's findings, CCP environmental science students had a higher perception of self-determination than non-CCP environmental science students. The study also

revealed that CCP students demonstrated a greater inclination towards future-oriented aspirations and career planning than their non-CCP counterparts. The CCP student population in this study also aligned with the typical CCP student according to the Ohio Department of Higher Education and Department of Education and Workforce Development statistics (ODHE, 2023). The discussion section below examines specific findings regarding each research question. The data collection and analysis identified themes that emerged from students' perceptions regarding their motivations and aspirations, and these themes provided answers to the research questions.

The information gleaned from the research study sheds light on factors that influence students' decisions to participate in CCP courses, particularly within the context of environmental science. Participation decisions appear to be shaped by various systematic factors, including enrollment patterns, gender disparities, socioeconomic status, parental education, and individual factors such as academic performance. Examining these influences through the perspective of self-determination theory offers insights into how students' perceptions of autonomy, competence, and relatedness played a role in their decision to participate and impact their educational outcomes. Exploring the perceptions and motivations of students enrolled in the CCP environmental and society course revealed multiple aspects driving their perceived value. The interplay between internal and external motivations served as a guiding force, shedding light on their educational path and aspirations.

Discussion

The data obtained from the CCP and non-CCP high school students served as the foundation for the study's three research questions. This discussion highlights the implications drawn from the findings. Guided by self-determination theory, the researcher aimed to understand students' intrinsic motivation, perceived value of education, and confidence in their

abilities (Deci & Ryan, 1991). The study also explored social-contextual factors that fostered intrinsic motivation and internalization, ultimately shaping desired educational outcomes and goals. Despite being sometimes viewed as independent, research suggests that learning and adjustment outcomes are complementary when fostered within a motivating school environment guided by self-determination theory (Deci & Ryan, 1985). This study's conclusions resonated with existing literature in the area of dual enrollment, student aspirations, and educational outcomes, mainly pertaining to the impact of academic engagement (Hornbeck, 2019).

Research Question 1

Research Question 1 asked: What self-determined interests motivated high school students' decision to participate in a College Credit Plus Environmental and Society course?

The research findings of this study indicate that CCP students demonstrated higher levels of self-determination across various domains and stages compared to non-CCP students. This heightened self-determination is evident in CCP students' proactive engagement with academic pursuits, as reflected in their confidence in goal-setting and action-taking. The study resonates with existing literature on dual enrollment, emphasizing the positive correlation between academic motivation, engagement, and performance in such programs (An & Taylor, 2019; An, 2015).

The results of this study also reveal some unexpected findings regarding the Self-Determination scores of CCP students compared to non-CCP students. Specifically, CCP students demonstrate higher Self-Determination scores in the Capacity and Opportunity domains and their respective sub-scales, as well as across the three stages of Think, Do, and Adjust. The results of each of the domains, subscales, and three stages from the Self-Determination Scale survey discussed below pertained to research question one and the impact of these findings as

they impact the conclusions drawn from the data collection and focus group interviews for research questions two and three. The triangulation of these data results helps to create a full picture of the students' interest, motivations and perceived value of the course.

In examining the Self-Determination Scale survey results in the Capacity domain, which assessed students' belief in their abilities and their feelings of competence, CCP students exhibited stronger beliefs in their competence and knowledge. Additionally, they exhibited a greater feeling of self-determination. These survey results suggest that CCP students may possess a greater perception of their academic abilities and greater confidence in their abilities compared to non-CCP students. This insight highlights the motivations behind CCP students' choice to enroll in academically rigorous courses. Their high perceptions of academic goals likely drive them to pursue challenging academic goals with confidence and determination.

Similarly, in the Opportunity domain of the Self-Determination Scale survey results, which evaluates students' perceptions of the Opportunities to use their knowledge and abilities both at school and at home, CCP students reported higher scores. This indicates that CCP students may perceive more opportunities to apply their skills and knowledge in various contexts, reflecting a greater sense of autonomy in their academic pursuits, but also hinting at their ability to envision and capitalize on future opportunities, thereby exhibiting a future-oriented mindset.

CCP students' strong identification with the college-going culture and aspirations for higher education aligned with previous research, suggesting that exposure to college-level coursework positively shaped students' identities as college-bound individuals. These students exhibited a forward-looking approach to academic and career goals compared to non-CCP students, who may have prioritized immediate academic achievements.

The most significant difference between CCP and non-CCP students was evident in the three stages of Think, Do, and Adjust. Particularly, the largest effect size of -1.7526 difference was noted in the Think stage, with CCP students demonstrating a notably higher Cohen d score. This suggested that CCP students are more adept at identifying and expressing their own needs, interests, and abilities, as well as setting expectations and goals to meet these needs and interests. This heightened ability to self-identify and set goals suggested that CCP students were not only focused on their immediate academic objectives but also possessed a forward-looking approach to their educational journey, which may have contributed to CCP students' overall sense of autonomy and self-determination.

Following the Think stage, CCP students also exhibited a greater ability to take action to meet their goals and expectations (Do stage). Although the effect size of -1.0257 was slightly smaller compared to the Think stage, it still reflected a large Cohen d score effect size further underscoring their autonomy and self-directedness in academic endeavors. This proactive approach to goal attainment aligned with a future-oriented mindset, where students were motivated to actively shape their academic and career trajectories. This indicated that CCP students were more proactive in making choices and plans to achieve their objectives, further underscoring their autonomy and self-directedness in academic endeavors.

Additionally, while CCP students also showed a medium effect size (-0.5533) in the Adjust stage, which involved evaluating the results of actions and altering plans, if necessary, the difference was not as pronounced as in the Think and Do stages. Nonetheless, this suggested that CCP students were more inclined to reflect on their actions and make adjustments as needed to effectively meet their goals, showcasing a level of adaptability and resilience that was vital for navigating future challenges and opportunities in their approach to learning.

These findings not only suggest that students participating in CCP courses may have exhibited higher levels of self-determination compared to their non-CCP peers but also hinted at their future-oriented mindset. This may have been because CCP students actively explored their knowledge and abilities by participating in the CCP environmental science course, enhancing their capacity and assessing opportunities to utilize their knowledge effectively, which in turn contributed to the development of self-determination skills among students, particularly in terms of competence, autonomy, goal setting, and adaptability. However, it was important to note that while these differences were observed between CCP and non-CCP students, further research is needed to explore the underlying factors contributing to these disparities and their long-term implications for students' academic success and well-being. The future-oriented mindset, as implied in the discussed study, refers to a cognitive orientation where individuals are not solely focused on their present circumstances but also actively anticipate, plan for, and work towards future goals and opportunities. In the context of the study on high school students participating in CCP courses, the data suggest that CCP students exhibited characteristics indicative of a future-oriented mindset. Specifically, CCP students exhibited a heightened ability to identify and express their own needs, interests, and abilities (Think stage), indicating a forward-looking approach to their educational journey. This suggests that CCP students were not solely focused on immediate academic objectives but were also proactive in setting expectations and goals to fulfill their long-term aspirations, highlighting their future-oriented engagement with academic pursuits.

Additionally, the data suggest that CCP students exhibited a greater ability to take action to meet their goals and expectations (Do stage). This proactive behavior implies that CCP students were not just passively responding to current academic challenges but were actively

shaping their educational trajectories. By making choices and plans to achieve their objectives, CCP students demonstrated agency and initiative in pursuing their future aspirations.

In the context of the Adjust stage of Self-Determination, CCP students demonstrated a capacity for reflection and adaptation, exemplifying their commitment to continuous improvement and growth in the face of challenges. This stage involved evaluating the results of their actions and making adjustments as needed to progress toward their goals. For example, CCP students who anticipated the challenge of balancing CCP coursework with other classes and extracurricular activities demonstrated this capacity. This capacity for self-reflection and adaptability highlights their resilience and determination to navigate challenges effectively.

A study conducted by An (2015) affirms, "Students who participated in dual enrollment are more academically motivated and engaged than nonparticipants" (p.98). In the present study, CCP students demonstrated higher levels of self-determination, indicating a proactive engagement with their academic pursuits, which could contribute to their success in the CCP environmental course. Notably, CCP students exhibited greater confidence in setting goals and taking action to achieve goals than in adjusting plans based on evaluation or results. This notion is supported by Bandura's (1995) concept of self-efficacy, where individuals with higher levels of efficacy tend to approach tasks as challenges to be overcome, leading to deeper interest and commitment. Overall, the future-oriented mindset highlighted in the material suggests that CCP students are not only academically engaged in the present but also possess a sense of purpose and direction towards their future goals. This orientation toward the future is characterized by proactive goal setting, action-taking, adaptability, and resilience, all of which are crucial for navigating the complexities of higher education and future career paths.

Furthermore, the study's findings align with Self-Determination Theory literature, emphasizing the importance of students' perceived capacities and opportunities in shaping their self-determination (Deci & Ryan, 1985; Deci & Ryan, 1987). The higher levels of self-determination among CCP students may have been attributed to their confidence in their abilities and the support they perceived in their school and home environments, reflecting a forward-looking approach to academic and career goals. These insights contribute to the collective understanding of student motivations for engaging in CCP coursework.

Research Question 2

Research Question 2 asked: How do the factors influencing the College Credit Plus Environmental and Society students compare to those influencing the typical dual enrollment student decision to participate in dual enrollment?

Enrollment Patterns

In this study, participant data mirrored College Credit Plus (CCP) enrollment patterns and their comparison to statewide trends indicated consistent enrollment distributions, including enrollment in CCP by grade level, enrollment by gender, course enrollment, socioeconomic status (SES), parental education, and academic performance. This suggests systematic influences such as school policies or social norms. This resonates with Self-Determination Theory, reflecting how external factors shapes students' autonomy in selecting educational pathways.

The alignment between the distribution of CCP environmental science students and the statewide enrollment trends in Ohio suggests a consistent pattern of increasing participation in CCP courses as students progress through high school. This consistency in enrollment distribution across grade levels indicates that the students' decisions to participate in CCP are influenced by factors that transcended individual preferences, possibly indicating systematic

influences such as school policies, academic counseling, or social norms, which would include parental education and influence. Relating this to self-determination theory reflects how external factors in the educational environment shape students' perceived competence in autonomy in selecting educational pathways (Deci & Ryan, 1985).

Gender Disparity

The findings of this study on gender-based enrollment in the CCP environmental science course reveal a significant disparity, with females exhibiting higher participation rates than males. This pattern aligns with broader trends observed across Ohio's CCP programs, where female students consistently demonstrate a greater preference for enrolling in CCP courses than their male counterparts.

In this study, regarding self-determination levels of female and male CCP environmental science students, the findings suggest small but notable differences in self-determination scores. Specifically, males exhibit lower self-determination than their female counterparts. This observation potentially sheds light on why more females tend to enroll in CCP coursework compared to males.

The analysis of the study data identified small to medium effect sizes across various aspects of self-determination, highlighting the nuanced differences in how female and male CCP environmental science students approached goal-setting, decision-making, and adapting to challenges. Notably, male CCP environmental science students demonstrated a medium Cohen d score effect size (+0.3579) in their ability to adjust, indicating a greater proficiency in evaluating the outcomes of their actions and modifying their plans accordingly to achieve their goals effectively compared to their female counterparts.

The difference in self-determination scores, particularly regarding the male students' ability to adjust, may offer insights into the phenomenon of gender parity observed in Career Technical Education (CTE) enrollment rates. Lynch and Hill (2008) noted this parity in their research on dual enrollment, suggesting that equal numbers of male and female students are enrolling in CTE programs. This phenomenon could be influenced by factors such as students' self-determination levels and their readiness to adapt and navigate academic and career pathways. It is important to note that research on the impacts of dual enrollment on female and male students have yielded mixed findings, as noted in the references to the Kentucky Council on Postsecondary Education (2020) and Kanny (2014).

Socioeconomic Status and Parental Education

The analysis of SES of all participants enrolled in the CCP environmental science course revealed notable disparities in economic backgrounds within the school system. Most environmental science students were found to be ineligible for free or reduced-price lunch, suggesting a relatively higher socioeconomic status compared to state data. This is in contrast to the state CCP population with a higher economically disadvantaged population. These findings align with existing research, which consistently demonstrates how socioeconomic factors influence dual enrollment participation. Previous studies consistently showed that lower-income students were often underrepresented among dual enrollment participants (Friedmann et al., 2020; Harlow, 2018; Hodara & Pierson, 2018; Hooker et al., 2021; Moreno et al., 2021; Pierson et al., 2017; Shields et al., 2021).

In this study, there was a notably large Cohen d effect size (-1.3499) between CCP and non-CCP students in their perceptions of opportunity at home and a medium Cohen d score effect size (-0.5620) between the two for their perception of opportunity at school. These

perceptions of opportunity reflected the students' feelings of autonomy, suggesting that CCP students perceived a higher level of autonomy at home and school than non-CCP students. Deci and Ryan (1987) emphasize how socioeconomic disparities may affect students' perceived autonomy and competence in assessing and succeeding in advanced coursework, reflecting systematic inequalities in educational opportunities. This corroborates the literature on socioeconomic factors and dual enrollment participation supporting the notion that SES influences students' decisions to engage in advanced coursework (Harlow, 2018, Hooker et al., 2021).

Additionally, this study examined the highest level of education attained by parents. Understanding the educational background of families allowed insight into their ability and opportunity to navigate educational pathways, SES, economic stability, and social mobility. Disparities in parental educational attainment within the study cohort may have reflected underlying inequalities in access to educational resources, opportunities, and support systems available in the household, which could have had profound implications for students' academic achievement and long-term goals. Among the ten CCP students surveyed, six had parents with graduate degrees, three had parents with four-year degrees, and only one was a first-generation college student. In contrast, the parents of all four non-CCP students had high school or some college coursework.

First-generation college students may face barriers due to limited knowledge of college processes and activities, potentially leading to lower levels of engagement compared to their peers. They often lack information on college applications and admission tests that may have required more remedial education (Choy, 2001; Thayer, 2000; Vargas, 2004). Additionally, students with parents without college degrees experience lower participation rates in dual

enrollment courses, highlighting disparities in access and opportunity (Shivji & Wilson, 2019). The stark differences in parental education attainment between CCP and non-CCP students highlight the intergenerational transmission of educational advantages. This disparity in parental education levels suggest that CCP students may have benefited from greater exposure to academic resources and support systems within their households compared to their non-CCP peers. This finding may also be why the CCP students had a high Cohen d score for perceived opportunity at home compared to non-CCP students. Higher parental education levels in this study correlate with CCP students feeling more empowered and autonomous in navigating their educational journeys.

This study directly illustrates the difference in perceived competence and autonomy between CCP and non-CCP students, with non-CCP students expressing they felt a lack of knowledge regarding resources, particularly in the realms of advising and networking. These students expressed concerns about their limited understanding of academic advising and networking opportunities. The feeling of uncertainty about how to effectively seek guidance or build connections, led to a sense of being uninformed or isolated when navigating their educational and career paths. This may have led to a perceived gap in their access to resources and support systems compared to their CCP counterparts, who were actively involved in advanced coursework and may have had more exposure to academic advising and networking opportunities. As a result, non-CCP students perceive a lower level of autonomy in managing their educational journey, particularly in relation to seeking guidance and building professional networks. This suggests that non-CCP students may have lacked exposure and support for higher education rather than inherently harboring lower aspirations.

Academic Performance

Research shows that students with higher levels of intrinsic motivation and self-determined forms of motivation tend to perform better academically (Deci et al., 1981; Daoust et al., 1988; Vallerand, 1991). An (2015) also explains that high academic performance reflects students' perceived competence and autonomy and engagement with challenging coursework, which could reinforce their motivation to participate in CCP programs. Connell and Wellborn (1990) suggest that intrinsically motivated students with more future orientation are more likely to stay in school, achieve academic success, and demonstrate conceptual understanding compared to students with less self-determined styles of motivation. Therefore, scoring the social-contextual conditions that facilitate self-determined forms of motivation is worthwhile.

This aligns with the findings from the study, which reveal significant academic achievement among CCP environmental science students, as evidenced by high GPAs and class ranks. The majority of the CCP students maintained GPAs of 4.00 and earned top-class ranks. Notably, four Senior CCP students tied for first place in their graduating class with the highest GPAs, while two Junior CCP students held the same distinction. This suggested strong academic performance within the CCP cohort, with the majority achieving GPAs of 3.4 or above.

In contrast, non-CCP environmental science students display a wider range of GPAs and class ranks, with some students ranking significantly lower. While some non-CCP students achieve high academic standing, there is a notable difference in the distribution of GPAs and class ranks compared to their CCP counterparts. The Wilcoxon rank-sum test reveal a significant difference in class rank, which indicats that CCP students tend to hold higher class ranks than their non-CCP peers. The higher academic achievement observed among CCP students compared to non-CCP students suggest that students' decisions to participate may be influenced

by their perceived competence and confidence in their academic abilities, thus indicating that academic performance significantly influence students' decisions to engage in CCP.

The information from the study indicated that CCP environmental science students perceive themselves as academically competent, engaged, self-motivated, and inclined to pursue challenging academic goals. This explains why the CCP students in this study had confidence in their academic abilities and perceive themselves as capable of succeeding in honors and advanced courses, making them more inclined to enroll in such courses. It is essential to account for student selection into dual enrollment programs because students are active participants in shaping their college experiences. The CCP students demonstrate higher levels of self-determination and capacity than non-CCP students which shows that the students' perceptions of their abilities play a crucial role in academic engagement and motivation. This is corroborated by dual enrollment research done by An and Taylor (2019) and self-determination research by Deci et al. (1981).

Research Question 3

Research Question 3 asked: What value do students perceive in participation in a College Credit Plus Environmental and Society course?

Future Planning and Uncertainty

The study reveals an alignment between the motivations and aspirations of the CCP students enrolled in environmental science courses and the principles of SDT. CCP students exhibit a strategic mindset, prioritizing future-oriented aspirations and personal development goals over immediate academic achievements. They perceive participation in the environmental course not only as a means to fulfill short-term academic requirements (e.g., fulfilling graduation requirements) but also as a strategic pathway towards long-term career success (e.g., gaining

early exposure to college-level coursework). This strategic approach mirrors the characteristics of identified regulation within SDT, where students engaged in activities because they value the outcomes and perceive them as aligning with personal goals (Deci & Ryan, 2017).

Analysis of responses to open-ended AIR Self-Determination survey questions reveal that CCP students tend to prioritize future-oriented aspirations and personal development goals (excelling in sports, prioritizing personal health, or preparing for college), while non-CCP students focus more on immediate academic achievements (passing the current class, doing well on mid-term exams). This highlights a distinct contrast between short-term and long-term goals, indicating that CCP students tend to prioritize future-oriented aspirations to a greater extent.

Furthermore, CCP students demonstrate a strong sense of autonomy and competence in navigating their academic journeys. They strategically position themselves for success in higher education and future careers. The analysis also highlights that CCP environmental students have a clearer vision of their academic and professional goals and tend to be more motivated within their coursework and achieve better academic outcomes. In contrast, non-CCP students may face challenges in similar adjusting and internalizing motivation, potentially due to a lack of ability or skills in aligning with future-oriented aspirations.

Relationships

The study’s focus group interviews provide insights into how relationships, particularly with the teacher and peers, influence students' decisions in participation regarding the environmental science course. Students mentioned the impact of the course instructor on shaping their aspirations and guiding them toward specific career paths. Additionally, students mentioned the course instructor as a significant source of information about the course, relying on their guidance and recommendations when making decisions about course enrollment. In the

overwhelming positive experiences reported by participants in this study regarding their environmental course instructor, participants noted that the environmental science instructor cared deeply about their students' learning and provided an atmosphere conducive to interactive learning processes. This suggests that the engagement and dedication of the course instructor contributed to creating a supportive learning environment that shaped students' engagement and perceptions of the value of the environmental science course. This study expands the research done by Kelly and Zhang (2016), which underscores the critical importance of supporting student-teacher relationships, fostering increased engagement levels, and ultimately improving student achievement.

Furthermore, students mentioned the influence of friends and classmates as a source of encouragement to pursue the environmental science course. For example, one CCP student mentioned that both her parents were Certified Public Accountants (CPAs), and another CCP student mentioned that his father was a financial advisor. A third, who was a non-CCP student mentioned that his father had started college to be a history teacher and dropped out, and he stated that he wanted to finish what his father had started. These responses highlight the influence of family and friends in shaping students' educational aspirations and choices. The research underscores the impact of the social environment on intrinsic motivation and autonomous self-regulation. This study supports with the research by Ryan (1991) showing that autonomy flourished in settings where individuals felt connected to significant adults, highlighting the crucial role of supportive relationships in nurturing self-determination. Therefore, individuals who prioritize fostering close relationships are more inclined to empathically consider others’ perspectives, potentially fostering a sense of mutual connectedness or relatedness.

Practical Considerations

The research findings indicate that while some students initially viewed the course as fulfilling graduation requirements and managing workload effectively, they later recognized its value beyond mere interest or convenience. They saw it as essential for fulfilling future academic or career aspirations and fostered feelings of competence and autonomy in their academic journey. These motivations are consistent with the need for autonomy and control over their academic endeavors. The findings suggest that while intrinsic motivation, such as personal interest, was present, practical considerations related to requirements, scheduling, and perceived course difficulty also had a noticeable impact on shaping students' perceptions of the course's value.

Financial considerations were discussed as factors influencing students' decisions regarding CCP enrollment in the environmental science course. One non-CCP participant noted the cost implications of failing a CCP course, which directly impacted their decision not to enroll for college credit. These findings underscore the multifaceted nature of student motivations and the importance of considering both intrinsic and practical factors in understanding their enrollment decisions.

Personal Development

This study highlights students' perception of the environmental science course as facilitating personal development in that the course served as a platform for students to encounter college, bolster confidence in their abilities, and confront academic challenges, thereby fostering personal development. Both CCP and non-CCP students mention the opportunity to experience college-level coursework as a valuable aspect of participating in the course, providing them with a glimpse into higher education's academic rigor and expectations. All participants emphasized

the significance of learning and taking greater responsibility for their academic work. They noted that the environmental course required a higher level of self-direction compared to their experiences in traditional high school classes, as they were expected to be more autonomous in completing course requirements.

Students demonstrated a sense of valuing beyond mere interest or engagement by internalizing the importance of the course's academic rigor and its role in enhancing critical thinking and problem-solving skills. Despite some struggles, they appreciated the opportunity to develop self-directed learning skills, knowing these would benefit their future academic endeavors. Additionally, students expressed that the course challenged them intellectually, particularly in understanding complex environmental concepts such as climate change and biodiversity, thereby fostering personal growth. The students in the study all noted that they experienced changes in their academic behaviors; they showed better study habits and high levels of academic motivation. Students who had not previously considered attending college now saw themselves as college material.

Subject Interest

Despite their initial reservations, students eventually developed a genuine appreciation for the environmental science course, attributing their enthusiasm to both the material's relevance and the engaging teaching style of their instructor. This shift in attitude underscored the fulfillment of their basic psychological needs for relatedness, competence, and autonomy. These findings highlight the significance of subject relevance and engagement in driving interest and participation in academic endeavors. Research conducted by Deci and Ryan (2000b) support the idea that intrinsic goals, like personal growth and environmental awareness, are key drivers of

their interest, highlighting the transformative influence of intrinsic motivations in academic pursuits.

Furthermore, students who were previously undecided on their career paths contemplated environmental science as a potential pathway, inspired by the interest and relevance they found in the course material. The course played a pivotal role in helping students determine their future majors because it provided opportunities for exploration, confirming or ruling out areas of interest, and narrowing down their career path. This alignment between interest, competence, and self-determination highlights the importance of intrinsic motivations in driving academic pursuits and career choices.

The students recognized the relevance of this course material to their lives and appreciated its impact, which demonstrated a deeper level of valuing that extends beyond initial perceptions or expectations. This emphasizes the pivotal role of valuing in driving interest and participation in academic endeavors, particularly when students find personal meaning and relevance in the subject matter.

Conclusion

Based on the data collected in this study regarding students' motivation, interest, and perceived value in participating in an environmental science course taught by a University of Findlay instructor, it is evident that these factors played a crucial role in students' decisions to engage in the course. The study underscores the significance of these factors in influencing students’ decisions to participate. The interconnected roles of motivation, interest, and value in shaping students' decisions to engage suggest that by acknowledging and nurturing intrinsic motivations, fostering interest in the subject matter, and emphasizing the value of advanced

coursework for academic and career goals, students can be empowered to pursue their educational aspirations with self-determined agency.

Students who participated in the course for college credit through the CCP program demonstrated a high level of motivation driven by both intrinsic (personal interest, desire for intellectual challenge) and extrinsic factors (earning college credits, advancing academic and career aspirations). The perceived value of earning college credits and gaining a head start in higher education served as a significant motivator for these students, who viewed the course as a means to achieve specific educational or career goals, thereby demonstrating a sense of personal value and purpose (identified regulation) in their participation.

Additionally, the findings highlight that students' interest and perceived value in the course were influenced by factors such as the relevance of the subject matter to their lives, the engaging teaching style of the instructor, and potential career pathways. This interest in the course material may have led to a shift in goal orientations from extrinsic to intrinsic (identified regulation). CCP students may have internalized their participation in the course due to the recognized benefits and value it offered, leading to autonomous decision-making based on long-term benefits and alignment with personal values.

Recommendations

The researcher’s recommendations derived from the findings of this dissertation aim to provide actionable strategies for enhancing students' post-secondary aspirations. By addressing critical factors such as motivation, value, and interest, these recommendations seek to bolster educational outcomes and ensure equitable access to higher education opportunities. Recognizing the impact of pre-college experiences on motivation, values, and interest in future decisions is essential.

Enhancing College and Career Exploration Initiatives

In light of the study's findings, it is recommended to develop and offer an introduction to postsecondary experience course or a College 101 and career exploration courses within high school curricula as outlined in Self-Determination Theory is crucial in shaping future decisions. These courses should integrate elements of Self-Determination Theory, fostering autonomy, competence, and relatedness among students. Universities play a key role in ensuring equal access to information and support programs, particularly for pathways related to dual enrollment courses, to address potential disparities in access and knowledge. This can be achieved by improving communication with students, providing mentorship programs, and offering early information and support to bridge gaps in understanding and access to college resources and opportunities. Moreover, recognizing the impact of pre-college experiences impacting motivation, values and interest in future decisions is essential. Hence, offering an introduction to postsecondary experience course or a College 101 and career exploration course designed to foster students' autonomy, competence, and relatedness, as outlined in Self-Determination Theory is crucial in shaping future decisions.

By offering these College 101 and career exploration course and establishing partnerships with high schools to provide free college credit course, universities can empower students to make informed decisions about their academic and career pathways while also expanding access to postsecondary experiences for a diverse range of students, particularly underserved populations. To address disparities in access and knowledge, improving communication channels and mentorship programs is crucial, especially concerning pathways related to dual enrollment courses. This course could be included as one of the 4.5 additional elective credits required for Ohio high school graduation. Integrating college-level coursework into the high school

curriculum allows students to gain valuable exposure to higher education while still in a supportive high school environment and greatly enhance students' pre-college experiences. Integrating college-level coursework into the high school curriculum allows students to gain valuable exposure to higher education while still in a supportive high school environment and greatly enhances students' pre-college experiences.

Strengthening Instructor Training and Collaboration

To ensure the instructional quality of College 101 and career exploration courses, comprehensive CCP instructor training should be offered to high school teachers involved in delivering these courses. This training should focus on enhancing instructional quality and fostering student engagement. Additionally, fostering collaboration between universities and high schools reduce barriers for students, facilitating a smoother transition to post-secondary education. To address funding issues and ensure instructional quality, the university could offer free CCP instructor training to high school teachers who could teach these College 101 and career exploration courses for college credit. Equipping teachers with the necessary skills and knowledge ensures that students receive a high-quality education that prepares them for future academic endeavors. Additionally, offering this course directly to the high school enhances accessibility and reduces barriers for students.

Customizing Course Content and Elements

Designing College 101 and career exploration courses with tailored content is imperative to promote student autonomy, competence, and relatedness. The elements the course should contain based on the results of this study would first be to incorporate components that promote autonomy by providing students with opportunities to make informed decisions about their academic and career pathways. This can include sessions on self-assessment, goal setting, and

navigating college resources independently. Secondly, the course should focus on developing students' competence by equipping them with the necessary skills and knowledge to succeed in college and beyond. This can involve workshops on study skills, time management, and academic planning, as well as information sessions on available support services and financial aid options. Thirdly, the course should prioritize fostering supportive relationships among students, faculty, and mentors, thereby enhancing students' sense of relatedness and belonging within the college community. Activities such as group discussions, peer mentoring programs, and networking events can facilitate connections and create a supportive environment where students feel valued and understood.

Furthermore, to instill a future-oriented mindset, the College 101 and career exploration course should incorporate elements of career exploration and goal setting, encouraging students to envision their long-term academic and professional aspirations. This can include guest speaker sessions with industry professionals, career assessments, and shadowing opportunities to gain insight into various career paths.

Lastly, recognizing the influence of pre-college experiences on future decisions, the course should integrate reflective exercises that encourage students to examine how their past experiences have shaped their goals and motivations. This can involve journaling activities, group discussions on personal narratives, and guided reflections on significant life events. These elements not only develop the essential skills and knowledge needed for academic success but also cultivate a sense of empowerment, belonging, and purpose that will guide students’ future decisions and endeavors.

Implementing Data-Driven Insights and Customization

Proactive interventions and support mechanisms further contribute to student success and retention. Leveraging data from College 101 courses can provide valuable insights into students' interests, aspirations, and educational needs. This holistic approach to student development will not only benefit individual students but also contribute to the recruitment and retention efforts of the university, ensuring a diverse and inclusive educational pipeline. Proactive interventions and support mechanisms further contribute to student success and retention. By analyzing the data gathered from the College 101 and career exploration course, educational institutions gain valuable insights into students' interests, aspirations, and educational needs, allowing them to customize course selections and program offerings to better align with their specific needs and goals. By tailoring course offerings to match students' interests and career aspirations, universities can increase student engagement and satisfaction, ultimately leading to higher retention rates.

This data-driven approach allows for the customization of course offerings to align with students' educational objectives and career aspirations, ensuring relevance and applicability. Moreover, by establishing pathways that align college-level courses with the educational objectives of students, universities can ensure that students are adequately prepared for their chosen academic and career paths. This alignment enhances the relevance and applicability of coursework, making it more meaningful and valuable to students. Additionally, nurturing relationships between students, faculty, and staff fosters a sense of belonging and connectedness within the university community, which is essential for student retention and satisfaction. Addressing social inequalities in education is also critical for maintaining a diverse and inclusive educational pipeline. By implementing proactive support mechanisims and initiatives aimed at

underserved and marginalized student populations, universities can create a more equitable learning environment where all students have the opportunity to succeed. By leveraging data-driven insights, customizing course offerings, and implementing proactive support mechanisms, universities can recruit and maintain students in an educational pipeline that promotes student success, retention, and diversity.

Limitations

While the study provided valuable insight into dual enrollment, it was important to acknowledge its limitations. Firstly, the study focused on one rural high school environmental course, which limits the extent to which the findings can be applied to other dual enrollment contexts. The relatively small sample size of ten CCP students and four non-CCP students also limits the generalizability of the results, as their experiences and perspectives might not capture the overall diverse experiences among dual enrollment students, particularly those from different socioeconomic backgrounds or geographic locations.

Moreover, the timing of the study, which involved data collection midway through the course, may have influenced students' responses. It is important to acknowledge that this approach may potentially limit the generalizability of the findings to the study population (Creswell & Clark, 2018; Seidman, 2013).

There may have been potential bias and subjectivity in data collection and analysis that could have influenced the study outcomes, potentially skewing the findings. Furthermore, the scope of variables examined in the study may have been limited, as external factors such as teacher effectiveness or school resources were not fully explored despite potentially influencing dual enrollment outcomes.

Finally, the diversity of participants in the study may have been limited, as it primarily consisted of Caucasian students from middle-income families. This could have restrict the generalizability of the findings if compared to more diverse student populations. It is essential to acknowledge these limitations, as they may constrain the extent to which the findings can be extrapolated beyond the study's specific context. Future research endeavors should aim to address these limitations by employing broader sampling strategies, exploring a more comprehensive range of dual enrollment courses, and conducting longitudinal studies to capture the evolving nature of students' experiences over time.

Future Research Opportunities

The study raised several unanswered questions that warrant further investigation in future research endeavors. There is an opportunity to delve deeper into the decision-making process of non-CCP students who opted not to enroll in CCP courses, particularly when they found themselves in the same course alongside their peers pursuing college credit for the same coursework. Understanding the factors influencing these students' decisions as non-CCP students in this context may reveal barriers or motivations that might dissuad or prevent them from participating in dual enrollment.

Another aspect to explore in future research is whether the presence of students enrolled in the same courses influence the thoughts and choices of non-CCP students in a course. Understanding this influence could provide valuable insights for developing strategies to encourage more students to participate in dual enrollment. Furthermore, replicating the current study at the same high school with a different cohort of students or at a different high school could bolste confidence in the study findings. A consideration for future research would be to explore gathering information through individual student interviews rather than focus group

sessions in a semi-structured format. This approach could provide more intimate and in-depth insights into each student's perspectives, goals, and experiences with the dual enrollment course, potentially uncovering nuances that might have been overlooked in a group setting. Additionally, conducting a longitudinal study to track participants through their postsecondary decisions could offer further insight into students' goal attainment and the impact of self-determined goal attainment. Such longitudinal research could provide valuable data on the persistence and success of students' education and career decisions following their participation in the environmental course.

In conclusion, while this study provided valuable insights into the motivations and experiences of students in a dual enrollment environmental science course, it also provide several opportunities to examine how high schools and universities can work together to better improve the student experience and lay a foundation to deeper understanding of the role and impact of self-determination in shaping students' academic and professional futures.

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Appendix A

Principal Name
High School Name
Address

Dear,

My name is Christy Stinehelfer and I am a second-year student in the Doctor of Education program at the University of Findlay. I am writing to request permission to conduct a research study at your institution. I hope you and your staff would be willing to help me with research for my dissertation.

My topic is **Interest, Value, and Self-Determination: An Analysis of High School Students' Participation in a Dual Enrollment Environmental Science Course.**

If approval is granted, I would like to recruit students from your College Credit Plus (CCP) Environmental Science class to participate in a survey and focus group interview, and I would appreciate the opportunity to observe the lab component of the course. The survey will be administered by the high school teacher instructing the CCP course and should take no longer than 15 minutes. I would arrange a time that would be appropriate for the teacher to conduct the interview and observe 3-6 lab sessions.

Interested students, who are under 18 years of age and volunteer to participate, will be given a consent form to be signed by their parent or guardian and returned to the researcher at the beginning of the survey process. The results will remain confidential and anonymous. Should this study be published, only deidentified results will be documented. No costs will be accrued by your school or by the individual participants.

If you agree to this, I will need a **Letter of Support** stating that you (the school) are aware and will support my research when the time comes (likely the 2023-2024 school year), pending Institutional Review Board (IRB) approval. The letter does not have to be long; however, it does need to be written on ***school letterhead***.

> *To Whom It May Concern:*
> *I am aware that Christy Stinehelfer is a second-year student in the Doctor of Education program at the University of Findlay. She is working on her dissertation on the topic of Interest, Value, and Self-Determination: An Analysis of High School Students' Participation in a Dual Enrollment Environmental Science Course.*
>
> *This is a letter of support for Christy Stinehelfer and her pursuit of her doctoral degree with the University of Findlay.* ***NAME OF*** *High School agrees to help Christy Stinehelfer attain the College Credit Plus Environmental Science student survey and focus group interview with students after the parent/guardian consent forms are attained. Students who are 18 years or older will be asked to sign their own consent forms.*

I would be more than happy to stop by to pick it up in person if need be.

If you have any questions, please feel free to reach out.

Sincerely,

Christy Stinehelfer

Appendix B

University of Findlay

CONSENT FOR A MINOR TO ACT AS A HUMAN PARTICIPANT

Parent/Legal Guardian permission form

Date:

Project Title: Interest, Value, and Self-Determination: An Analysis of High School Students' Participation in a Dual Enrollment Environmental Science Course

Primary Investigator and Co-Investigator: Dr. Christine Denecker and Christy Stinehelfer

What is the study about?
The study aims to understand the experiences and motivations of high school students enrolled in an environmental science dual enrollment course. Through surveys, focus group interview, and observations, the study seeks to identify factors that contribute to students' enrollment in the course and the value they derive from it.

Why are you asking my child?
Your child is being asked to participate because they are a dually enrolled in a CCP environmental science course through the University of Findlay.

What will you ask my child to do if I agree to let him or her be in the study?

If you agree to allow your child taking part in this research study, the following will occur:

1. Your student will be asked to complete a survey to obtain their perspective on why they participated in an environmental science dual enrollment course. The survey will have close-ended questions and contain an AIR self-determination scale to measure their motivations for taking the environmental science course. The survey will be completed in one sitting, lasting approximately 15-20 minutes.
2. Your child, as a study participant, will be observed by the researcher 3 to 6 times, during their environmental science course lab.
3. A focus group interview will be conducted approximately three weeks after the completion of the survey. The focus group interview will last between 45-60 minutes.

Is there any audio/video recording of my child?
In order to accurately understand and use the information your child provides, interviews will be audio recorded. The recording will be used for transcribing the interview. The interview recording may be quoted without your child's real name in a publication or a presentation. Because your child's voice will be potentially identifiable, the researcher will limit access to the tape as described below.

What are the dangers to my child?
The Institutional Review Board at The University of Findlay has determined that participation in this study poses less than minimal risk to participants. The risk to the subjects of this research is minimal and no greater than the risk encountered during everyday educational activities.

If you have any concerns about your child's rights, how they are being treated or if you have questions about this project or benefits or risks associated with being in this study can be answered by the principle investigator, Dr. Christine Denecker, who may be contacted at (419) 434-6661, denecker@findlay.edu

Are there any benefits to my child as a result of participation in this research study?
Your student's participation in this study of a CCP environmental science course can offer them several benefits. These benefits may include the opportunity to reflect on their experiences, contribute to the development of more inclusive and equitable education policies and practices, and potentially improve the quality of education for future students. Additionally, participation in research can be a fulfilling and meaningful experience for some students as they contribute to advancing knowledge in their field of interest.

Are there any benefits to society as a result of my child taking part in this research?
The study may provide insights that improve future programs delivering college courses for high school students and lead to an increase in the number of postsecondary credentials obtained by high school graduates. Improving the understanding of the factors that contribute to students' enrollment in dual enrollment courses and how they value the course material may also help address educational access and equity issues. Additional benefits to society may include improving education policies and practices, informing policy decisions, and contributing to the advancement of knowledge and environmental science education.

Will my child get paid for being in the study? Will it cost me anything for my child to be in this study?
Your child's participation is entirely voluntary, and nonparticipation will not negatively impact your child's grade. There are no costs to you or payments to you or your child as a result of participation in this study.

How will my child's information be kept confidential?
Your child's identity will be kept anonymous by using a pseudonym in the data and all study related information will only be accessible to the student researcher and primary investigator. Any identifying information will be kept in either a secure office in a locked cabinet or on a password-protected computer. The data will only be used for research purposes and participants will not be identified in any dissemination of research; only aggregated data will be used.

What if my child wants to leave the study or I want him/her to leave the study?
"You have the right to refuse to allow your child to participate or to withdraw him or her at any time, without penalty. If your child does withdraw, it will not affect you or your child in any way. If you or your child chooses to withdraw, you may request that his/her data which has been collected be destroyed when possible."

What about new information/changes in the study?
"If significant new information relating to the study becomes available which may relate to your willingness allow your child to continue to participate, this information will be provided to you when possible."

Voluntary Consent by Participant:
By signing this consent form, you are agreeing that you have read it or it has been read to you, you fully understand the contents of this document and consent to your child taking part in this study. All of your questions concerning this study have been answered. By signing this form, you are agreeing that you are the legal parent or guardian of the child who wishes to participate in this study. By signing this form you are providing written permission for the review of the students unofficial high school transcript, grades, courses taken and ACT, SAT and/or Accuplacer standardized placement scores which qualified your student for the CCP course. The federal laws state that your permission is needed for the researcher to access your students school records.

_____ Date: _____
Participant's Parent/Legal Guardian's Signature

_____ Date: _____
Participant's Parent/Legal Guardian's Signature

Appendix C

AIR Self-Determination Scale
STUDENT FORM

Student's Name_____Date_____

School Name_____

Your Grade_____Your Date of Birth_____
Month Day Year

HOW TO FILL OUT THIS FORM

Please answer these questions about how you go about getting what you want or need. This may occur at school, or after school, or it could be related to your friends, your family, or a job or hobby you have.

This is not a Test. There are no right or wrong answers. The questions will help you learn about what you do well and where you may need help.

Goal You may not be sure what some of the words in the questions mean. For example, the word **goal** is used a lot. A **goal is something you want to get or achieve**, either now or next week or in the distant future, like when you are an adult. You can have many different kinds of goals. You could have a goal that has to do with school (like getting a good grade on a test or graduating from high school). You could have a goal of saving money to buy something (a new iPod® or new sneakers), or doing better in sports (getting on the basketball team). Each person's goals are different because each person has different things that they want or need or that they are good at.

Plan Another word that is used in some of the questions is **plan**. A **plan is the way you decide to meet your goal, or the steps you need to take in order to get what you want or need**. Like goals, you can have many different kinds of plans. An example of a plan to meet the goal of getting on the basketball team would be: to get better by shooting more baskets at home after school, to play basketball with friends on the weekend, to listen to the coach when the team practices, and to watch the pros play basketball on TV.

The AIR Self-Determination Scale was developed by the American Institutes for Research (AIR), in collaboration with Teachers College, Columbia University, with funding from the U.S. Department of Education, Office of Special Education Programs (OSEP), under Cooperative Agreement HO23J200005

HOW TO MARK YOUR ANSWERS

EXAMPLE QUESTION:

I check for errors after completing a project.

EXAMPLE ANSWER:

Circle the number of the answer which tells what you are most like:
(Circle **ONLY ONE** number).

1. **Never.....**student **never** checks for errors.
2. **Almost Never .....**student **almost never** checks for errors.
3. **Sometimes .....**student **sometimes** checks for errors.
4. **Almost Always.....**student **almost always** checks for errors.
5. **Always .....**student **always** checks for errors.

REMEMBER

There are NO right or wrong answers.	This will not affect your grade. So please think about each question carefully before you circle your answer.

THINGS I DO

1. I know what I need, what I like, and what I'm good at.	Never **1**	Almost Never **2**	Sometimes **3**	Almost Always **4**	Always **5**
2. I set goals to get what I want or need. I think about what I am good at when I do this.	Never **1**	Almost Never **2**	Sometimes **3**	Almost Always **4**	Always **5**
			Things I Do – Total Items 1 + 2		
3. I figure out how to meet my goals. I make plans and decide what I should do.	Never **1**	Almost Never **2**	Sometimes **3**	Almost Always **4**	Always **5**
4. I begin working on my plans to meet my goals as soon as possible.	Never **1**	Almost Never **2**	Sometimes **3**	Almost Always **4**	Always **5**
			Things I Do – Total Items 3 + 4		
5. I check how I'm doing when I'm working on my plan. If I need to, I ask others what they think of how I'm doing.	Never **1**	Almost Never **2**	Sometimes **3**	Almost Always **4**	Always **5**
6. If my plan doesn't work, I try another one to meet my goals.	Never **1**	Almost Never **2**	Sometimes **3**	Almost Always **4**	Always **5**
			Things I Do – Total Items 5 + 6		

HOW I FEEL

1. I feel good about what I like, what I want, and what I need to do.	Never **1**	Almost Never **2**	Sometimes **3**	Almost Always **4**	Always **5**
2. I believe that I can set goals to get what I want.	Never **1**	Almost Never **2**	Sometimes **3**	Almost Always **4**	Always **5**
			How I Feel – Total Items 1 + 2		
3. I like to make plans to meet my goals.	Never **1**	Almost Never **2**	Sometimes **3**	Almost Always **4**	Always **5**
4. I like to begin working on my plans right away.	Never **1**	Almost Never **2**	Sometimes **3**	Almost Always **4**	Always **5**
			How I Feel – Total Items 3 + 4		
5. I like to check on how well I'm doing in meeting my goals.	Never **1**	Almost Never **2**	Sometimes **3**	Almost Always **4**	Always **5**
6. I am willing to try another way if it helps me to meet my goals.	Never **1**	Almost Never **2**	Sometimes **3**	Almost Always **4**	Always **5**
			How I Feel – Total Items 5 + 6		

WHAT HAPPENS AT SCHOOL

1. People at school listen to me when I talk about what I want, what I need, or what I'm good at.	Never **1**	Almost Never **2**	Sometimes **3**	Almost Always **4**	Always **5**
2. People at school let me know that I can set my own goals to get what I want or need.	Never **1**	Almost Never **2**	Sometimes **3**	Almost Always **4**	Always **5**
What Happens at School – Total Items 1 + 2					
3. At school, I have learned how to make plans to meet my goals and to feel good about them.	Never **1**	Almost Never **2**	Sometimes **3**	Almost Always **4**	Always **5**
4. People at school encourage me to start working on my plans right away.	Never **1**	Almost Never **2**	Sometimes **3**	Almost Always **4**	Always **5**
What Happens at School – Total Items 3 + 4					
5. I have someone at school who can tell me if I am meeting my goals.	Never **1**	Almost Never **2**	Sometimes **3**	Almost Always **4**	Always **5**
6. People at school understand when I have to change my plan to meet my goals. They offer advice and encourage me when I'm doing this.	Never **1**	Almost Never **2**	Sometimes **3**	Almost Always **4**	Always **5**
What Happens at School – Total Items 5 + 6					

WHAT HAPPENS AT HOME

1. People at home listen to me when I talk about what I want, what I need, or what I'm good at.	Never **1**	Almost Never **2**	Sometimes **3**	Almost Always **4**	Always **5**
2. People at home let me know that I can set my own goals to get what I want or need.	Never **1**	Almost Never **2**	Sometimes **3**	Almost Always **4**	Always **5**
What Happens at Home – Total Items 1 + 2					
3. At home, I have learned how to make plans to meet my goals and to feel good about them.	Never **1**	Almost Never **2**	Sometimes **3**	Almost Always **4**	Always **5**
4. People at home encourage me to start working on my plans right away.	Never **1**	Almost Never **2**	Sometimes **3**	Almost Always **4**	Always **5**
What Happens at Home – Total Items 3 + 4					
5. I have someone at home who can tell me if I am meeting my goals.	Never **1**	Almost Never **2**	Sometimes **3**	Almost Always **4**	Always **5**
6. People at home understand when I have to change my plan to meet my goals. They offer advice and encourage me when I'm doing this.	Never **1**	Almost Never **2**	Sometimes **3**	Almost Always **4**	Always **5**
What Happens at Home – Total Items 5 + 6					

PLEASE WRITE YOUR ANWERS TO THE FOLLOWING QUESTIONS…

Give an example of a goal you are working on.

What are you doing to reach this goal?

How well are you doing in reaching this goal?

The following questions are basic demographic questions please answer them the best of your ability.

1. I am:
   - Female
   - Male
   - Prefer not to answer

2. Which category best describes your ethnicity (check all that apply)?
   - American Indian or Alaska Native
   - Asian
   - Black or African American
   - Native Hawaiian or Other Pacific Islander
   - Hispanic or Latino
   - White
   - Prefer not to answer

3. The number of college credits I have earned through taking CCP coursework:
   - (0-6)
   - (7-12)
   - (more than 12)

4. I took CCP courses in the following subjects (check all that apply):
   - Accounting
   - Animal Science
   - Biology
   - Business
   - Chemistry
   - Communication
   - English
   - Finance
   - Foreign Language
   - History
   - Math
   - Physics
   - Political science
   - Psychology
   - Sociology
   - Other

5. Has your perception of college changed as a result of being a CCP student?
   - Yes
   - No

6. Would you recommend taking CCP courses to current high school students?
   - Yes
   - No
   - Maybe

7. How did you find out about this course?
   - Friends
   - Family
   - Teacher
   - Advisor/Counselor
   - Other _____

8. Would you recommend ESHO 100 Environmental and Society to other high school students?
   - Yes
   - No
   - Maybe

9. What were influences on your decision to enroll in this course (check all that apply):
   - Family
   - Friends
   - College Credit
   - Free class
   - Teacher
   - Gain career perspective
   - Personal Interest

10. What do you plan to do after high school?
    - Go to work
    - Join the Military
    - Attend college
    - Other _____

11. What is your high school grade point average (GPA)
    - 3.4 or above
    - 3.0 to 3.3
    - 2.5 to 2.9
    - 2.0 to 2.4
    - 1.9 or below

12. What is the highest degree or certificate you eventually plan to obtain?
    - High school Diploma or Certificate
    - Technical certificate or Diploma
    - Associate's Degree
    - Bachelor's Degree
    - Graduate Degree

13. To the best of your knowledge, what is the highest education level achieved by your parent?
    - High not completed
    - High school Diploma or equivalent
    - Some college-level work completed
    - Technical certificate or Diploma
    - Associate's Degree
    - Bachelor's Degree
    - Graduate Degree
    - Do not know

14. Do you have siblings who attended college?
    - Yes
    - No

15. Which of the following resources do you feel knowledgeable about in supporting your pursuit of your career interests? Select all that apply.
    - Financial aid
    - Scholarships
    - Apprenticeship
    - Advising
    - Networking opportunities
    - Other _____

16. What is your family's income level?
    - Under $25,000 a year
    - $25,000 to $50,000 a year
    - $50,000 to $75,000 a year
    - $75,000 to $100,000 a year
    - Over $100,000 a year
    - I don't know

17. While in high school, I am eligible for the free/reduced price lunch program.
    - Yes
    - No
    - I don't know

Appendix D

Focus Group Semi-Structured Questions

1. As a child, what did you want to be when you grew up? Why was that profession attractive to you?
2. Why did you choose to participate in this environmental science course?
3. What topics or skills do you believe this course focused on the most?
4. What were you hoping to gain from taking the environmental science course?
5. Have you gained what you expected so far? Why or why not?
6. Do you think other high school students would **enjoy** this class? Why or why not? **(like vs value the class)**
    a. Can you give some examples of what aspects you think they would or would not enjoy?
7. If you had the opportunity as a CCP student to attain an **Occupational Safety and Health Administration (OSHA) Management Certification,** would you consider enrolling? Why or Why not?

    This 40-hour course is designed to teach you how to stay safe while handling dangerous chemicals in hazardous waste operations. It covers a variety of topics related to Hazardous Waste Operations and Emergency Response (HAZWOPER), including site characterization, hazardous chemicals, radiation hazards, and personal protective equipment (PPE), and decontamination methods.
    You would learn best practices for safely handling and responding to hazardous waste emergencies and increase your knowledge about OSHA standards. Additionally, you would learn about labeling chemicals to make sure you are compliant with OSHA's Hazardous Communication Standard.
    This course is perfect for environmental contractors and consultants, well drillers, regulatory agency personnel, private-sector project managers, and others who will need to enter hazardous waste sites. There are no prerequisites. This course also satisfies the requirements of the Technician Level Emergency Response course.
    By taking this course, you would learn to protect yourself and others from hazardous chemicals and respond safely in emergencies.

8. Is there any advantage(s) you believe you have gained compared to your peers by participating in this course? If so what are they?
9. What type of job or career are you hoping to have several years from now?
    a. What interests you about that job or career?
10. What skills or knowledge do you think would be most important for someone pursuing the career you are interested in?
11. Can you provide an example of how you believe this course could be useful in your future career or education pursuits?

***Is there any additional information that you would like to share that I have not asked?