Student Agency and Collective Bootstrapping in Integrated Career and Technical Education: A Photovoice Project

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STUDENT AGENCY AND COLLECTIVE BOOTSTRAPPING

IN INTEGRATED CAREER AND TECHNICAL EDUCATION: A PHOTOVOICE PROJECT

A Dissertation
Submitted by
Panagiota Athinelis

In partial fulfillment of the requirements for the degree of
Doctor of Philosophy

Lesley University
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Dissertation Approval Form

Student Agency and Collective Bootstrapping
in Integrated Academic/Technical Career and Technical Education:
A Photovoice Project

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Graduate School of Education
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Ph.D. in Educational Studies
Individually Designed Specialization

Approvals
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DEDICATION

To “the kids”

That I have had the privilege of working with, and learning from, over the years.

Little JJ, a beautiful light that entered my life during a time of darkness.

and

Ανδριανή Ζωή
και
Αλεξ
Θα σας κρατάω πάντα στην καρδιά μου
ABSTRACT

Secondary Career and Technical Education (CTE) provides students with a full education in academic areas as well as a career area of interest, allowing students to apply their school-based learning in the real world through work-based learning. At the same time, urban CTE adolescents have historically been marginalized and placed in a deficit model. The purpose of this qualitative study was to uncover the ways in which student agency is co-created in an urban, transdisciplinary CTE high school program, as well as to identify the institutional systems and structures that support or hinder the development of student agency.

Eight students participated in the entirety of the data collection process consisting of individual interviews and focus groups; photographs, videos, and any other artifacts that the participants selected; and, the researcher’s own observations of students during their normal activities at school (audio, video, and/or observational notes). The Photovoice approach was utilized to give power to the voices of youth who are traditionally marginalized and to encourage patterns in the data to emerge through their lens and voice. The data analysis was guided by Charmaz’s (2016) constructivist grounded theory approach, through which the following interpretive theory was created: The development of student agency in integrated academic/technical Career and Technical Education occurs through ongoing, meaningful experiences and relationships that are connected, integrated, and impact the students’ sense of self in relation to the world. The mindset of collective bootstrapping is a secondary interpretive theory that supports the students’ perseverance and resilience in the face of challenges, both in and out of school, and contributes to their drive to carry themselves and others toward the dream of success in their lives. In contrast with the American individualist ideal of ‘pulling yourself up by your bootstraps,’ and the critical viewpoint that it is impossible for marginalized populations
to do so due to oppressive overarching systems and structures, the *collective bootstrapping*
mindset is one that describes the remarkable resilience and drive that empower marginalized
adolescents to pull themselves and others up with the ongoing support of a community of peers
and adults.

*Keywords:* Career and Technical Education, student agency, adolescent learning, Latinx identity,
critical pedagogy, transdisciplinary learning, academic and technical integration, photovoice,
project-based learning, constructivist grounded theory
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CHAPTER 1: INTRODUCTION

1.1 My Journey: An Overview

About eleven years ago, I stumbled into my first teaching position as a long-term ELA substitute at a secondary Career and Technical Education (CTE) school. As a business major who had recently moved back to the United States after seven years in Greece, I knew virtually nothing about CTE in the United States and was not even sure if the career change would be a fit for me. Very quickly, urban, secondary CTE became more than a work setting to me; it is my home, and it is deeply rooted in my identity as an educator. The value on education and work in my childhood home mirrors the marriage of education and work in the CTE setting. Therefore, in retrospect, the familiarity and immediate sense of belonging that I felt as I entered the secondary CTE world makes complete sense to me. The deep sense of agency and mission that I feel about building upon the strengths of CTE to bring it even further reflects directly from the values instilled in me by my family, and the opportunities that I have been lucky enough to enjoy have shaped me into who I am.

1.2 What Education and Work Mean to Me

Growing up, education was always the top priority at my home, cherished and valued above most anything else. My father, a Greek bilingual teacher at that time in one of the largest urban public school districts in the United States, established a rule at home that family should speak to me only in Greek. When I was five years old, he created a makeshift classroom for me in our basement complete with a chalkboard, a teacher’s desk for him, a single tiny student desk
for me, and posters of oversized Greek letters lined across the walls. Every night during the school year, he taught me lessons in reading and writing, and eventually started to introduce English as well. As I continued to get older, the expectations for academic achievement grew and the time I spent on learning continued to multiply, until eventually I was self-driven and did not need my parents to push me or remind me of the priorities. In addition to schoolwork, I committed to playing after-school sports for three of the three seasons (even though I was not good at any of them), was a member of a range of after-school clubs, often taking on leadership roles, and played the piano, clarinet and violin. My first ‘all-nighter’ was at age fifteen when I wrote a debate and moderator handbook for the Junior State of America club, a nationwide organization that is entirely student-run.

During the summertime, my family shifted focus from school to working at our seasonal restaurant. Being such a short season, my father and mother both modeled their expectation for commitment by working seven days per week and for an average of fourteen-hour days. Even as my father’s multiple sclerosis progressed, he insisted on being there, and as a rule did not miss a day unless he was hospitalized. My three younger siblings and I worked as much as we possibly could starting at a young age, and days off were considered a luxury that we would enjoy rarely. As young as we could manage, we began by refilling napkins and condiments, cleaning tables, and eventually worked our way to hand-tossing pizzas, frying clams and grilling paninis. The responsibilities of training new employees, correcting orders, creating the weekly staff schedule, and problem-solving around food cost, efficiency, and food quality were added to our plates as soon as we were ready. The restaurant was not just a source of income for my family; especially for my father, it was a source of pleasure and pride. For my siblings and me, it was our way of
contributing to the household and spending time with the family. Even though it was back-breaking work, we felt a sense of accomplishment and even joy from doing it.

The message to us was simple: hard work and education equal success.

I attended a public school in a small town on the Northeastern coast of the United States with an almost entirely White and affluent population. My parents made the decision to move there because the schools were so highly rated. It took me some time, but eventually I realized that my experiences and identities were different from most other children in my community. When my friends’ parents worked a lot, they would not see them. When my parents worked a lot, I was right there beside them. This gave me the illusion that my family was at a disadvantage. I remember I was embarrassed to carpool with my friends, especially in the springtime, early/late summer, and fall when the restaurant was open. My friends’ mothers would come wearing beautiful designer clothing, carefully manicured fingernails, and flawless makeup. When it was my mom’s turn, I would cringe as she exited the car to hug me wearing a faded tank top stained with drops of pizza sauce and black capri yoga pants spattered with white flour. Our Chevrolet mini-van always smelled like a mix of pizza dough and sweat in contrast with the minty-fresh new car scent and sleek leather interiors in my friends’ Lexus and Audis.

Another aspect of the community that added to my sense of Otherness was the degree to which the population was homogeneous: not only White, but a specific kind of White. The Catholic, of Irish/English ancestry, Lily Pulitzer-wearing kind of White. Their wealth was a mix of old and new, and the size of their houses along with luxurious amenities and furniture made my house feel like a tiny, dilapidated shack (it was not). Though I am White, my language, ethnicity, religion, name, socioeconomic status, and culture made me feel like an alien at the
time. Though I became quickly adept at navigating and conforming to the dominant culture, deep down I always felt out of place. Now, I look back, chuckle at myself and push down the embarrassment I feel at my total ignorance of my privilege. Sure, in comparison, I may not have enjoyed the same degree of privilege as my classmates, but when I finally ventured outside the bubble of my small town I began to realize the extent to which I myself was privileged and not so different from my friends. My religion (really just a different kind of Christian), my skin color (White), my socioeconomic status (high enough that I could live abroad and attend a private school- more on that in the next paragraph) were not all that different than my friends.

When I was sixteen years old, I was anxious to break free from the monotony of the small-town life and experience something diverse and exciting. As many of my friends were planning to spend a year abroad during their junior or senior year of high school, I concocted a plan of my own to experience the world. Knowing that my parents were too strict to allow me to live with strangers, I used my skills in argumentation from debate club, skills in money management from working in my parents’ restaurant and leveraged my parents’ value on education to convince them to allow me to spend a year abroad in Greece. After presenting them with a cost-benefit analysis and carefully crafted arguments that spanned over a few months, my parents finally agreed to the year abroad that eventually ended up extending into a seven-year experiential learning journey. I attended an American high school in Athens that offered an International Baccalaureate program, as I was attracted to the inquiry-based, flexible model of learning, a stark contrast from the rigid structure of the typical American public-school system. As I began my year in a foreign country without my parents, in a new school, and with the pressures of adapting to the culture and language, I encountered many life lessons that I carry with me today as an educator and life-long learner. Though I felt frustrated at times, I relished
and thrived in the change. Since this experience took place amidst my impressionable teenage years, it shaped me as a learner and fueled my pursuit for continuous learning opportunities, as well as my hope to inspire this desire in others.

Upon completing high school and believing I would remain in Greece, I enrolled at the American College of Greece. I chose to declare my major in Business Administration with a concentration in International Business. I thought that the business world would be a good fit for me, picturing a fast-paced, dynamic environment with plenty of opportunities for research, problem-solving, and implementation of innovative ideas. With my passion for learning foreign languages, I felt the concentration in International Business would open doors for me professionally in Greece and internationally. As I completed my degree and engaged in work experiences in different areas of business, I felt unfulfilled professionally. I also had limited academic opportunities in Greece to attain my goal of furthering my education, and as the job market continued to decline, I made the decision to return to America.

I moved back to the United States shortly thereafter and explored the option of switching my career to teaching. Unsure if it was the right choice at the time, I made arrangements to assist as a volunteer in a fifth grade classroom in a large, urban school district. The teacher who I worked with gradually released responsibility to me, beginning with observing her teaching and eventually to planning and delivering lessons. It was with this experience that I fell in love with teaching and the educational process. I felt enlightened and inspired by my first day in the classroom. I finally felt like I had found my niche. At the same time, I thought about the wealth of opportunities in my own educational background as I worked with the students in comparison with the harsh truth about disadvantages in their lives. The truth about the way the world really works hit me like a truck and shattered my naïve assumptions about equality in education. It
sickened me, angered me, while also evoking a strong sense of guilt. This made me determined to work in a similar setting to provide disadvantaged students with the tools needed to succeed and expand their opportunities.

I embarked on my path into the world of education in a temporary position as an English teacher at a regional vocational technical high school. I was thrilled to have the opportunity to work in an urban setting with a high at-risk and diverse student population. With the average reading level of entering ninth grade students falling approximately at the sixth grade level, and a portion of these students receiving Title I reading services, I was amazed at the number of students in need of support. I was also intrigued by the extensive technical program offering students the choice of twenty-four areas of trade and professional specializations, ranging from masonry to engineering. Although I did not know much about the area of technical education at the time, the concept of providing at-risk students with hands-on, experiential learning opportunities alongside academics was as a strong, unique attribute of the school and intrigued me as an educator. Through the encouragement of my mentor, I also volunteered my time after school guiding students in community service learning activities. This experience was a key building block in developing my views about the importance of educating the whole child, and in shaping my awareness that hands-on, authentic educational activities can be a powerful tool in developing students’ desire to learn.

As an English instructor, I began my year with the intention of pursuing a master’s degree in teaching English. I enrolled in a foundational teaching course a local university to learn skills in pedagogy that I could immediately implement in the classroom. A personal area of focus in my learning during my first semester was in searching for ways to engage and motivate students to learn, as I found very quickly that many of my students were
reluctant to participate in learning activities. Some even shut down completely and refused to complete assignments. I tried a variety of approaches, and although my attempts seemed to temporarily grab their attention, they still were not completely effective in sustaining students’ motivation to carry out their reading responses and writing assignments.

As I continued my efforts, one specific situation occurred that shifted my thinking to a considerable extent. One eleventh grade student had barely passed in any written work, misbehaved daily, and would sometimes refuse to even open his book to read. Thinking that he may have been experiencing troubles at home, I asked him to stay after school with me to catch up while at the same time hoping that I would have some one-on-one time with him to uncover the reasons behind his behavior. At one point during this after school session, I asked him to read a brief passage aloud to me, and I was stunned to discover that he had difficulty reading even some basic sight words. He let his guard down as we discussed his feelings of embarrassment and frustration about his difficulties with reading. This gave me valuable insight into the challenges of a struggling adolescent reader. This one event opened my eyes to one of the most significant factors behind my students’ reluctance to learn: the texts that I expected them to read and write about were often well beyond their current decoding and comprehension skills.

Since my role as an English teacher was to teach the prescribed content of the courses, which were centered on complex, challenging texts, I could not spend a substantial amount of time with students addressing the root of their struggles. The alarming literacy needs of so many students shifted my thinking about my academic goal of pursuing a master’s degree in English and I began contemplating a move in the direction of reading and literacy. I felt that learning more about the reading process would help me in meeting the needs of students in my English
classroom, opening a door to potentially transition into serving students as a reading specialist. I then enrolled in a M.Ed. in Reading program.

Since my early experiences that I just described, my role as an educator has evolved in different ways. I transitioned in and out of different roles in secondary CTE, including a reading specialist, a coach for teachers in academic and technical disciplines, and more recently a coordinator of a transdisciplinary STEAM program. Through these roles, I discovered that CTE schools inherently create tremendous opportunities for student learning and development of agency. At the same time, I became frustrated with the multiple barriers that prevent students in urban CTE settings from consistently achieving high levels of agency and success.

1.3 Perspectives, My Sense of Agency and the Privilege I Carry

In my research on student agency within an urban secondary technical school setting, I continuously consider the complex sociocultural context that surrounds my area of focus. Since the sociocultural context is multilayered, I must apply a careful lens to deconstruct each layer as well as determine the collective implications that are deeply intertwined. I can distinguish three distinct sociocultural layers within the context of my research: my own background as the observer, the characteristics of the teachers who are tangentially connected to the research, the institutional structures that create this setting, and the students who are the ultimate focus of the research.

Students in an urban technical high school setting are at the center of my focus, the first layer that I will attempt to deconstruct. They begin their schooling with a variety of disadvantages that contribute to significant needs in literacy skills within the “dominant meaning systems” (Minnich, 2005). As Rothstein (2004) explains, students with low-socioeconomic
status are often underprepared for school as they often lack access to a literacy-rich home environment and adequate health care. Literacies and ways of knowing that are valued in the home environment often are different from those valued in school. These students also experience the negative impact of the wealth gap (Shapiro, 2004), as their families often lack the financial resources to provide them with adequate access to educational experiences outside of school. Struggles with cognitive, socio-emotional, and cultural demands of school-based literacies occur for students without access to quality preschool programs (Darling-Hammond, 2010). To add unfortunate complexity to this problem, the United States has steadily decreased funding for social policies to provide for the health, financial security, and overall well-being of children and families (Hill, 2006; Russell, 2010). Education is inherently political (Freire, 1998), and systems and structures of schools perpetuate hegemony and elitism that oppress groups of people (Giroux, 2011). I have focused part of my studies on social and educational policy, characteristics of urban, poor students and their families, and the effects of these factors on overall student learning. These social, cultural, economic, historical, and political forces have been a thread tying my areas of research focus together, deepening my understanding of their unique perspectives, impacting the way in which I process and understand educational research, pertaining to the opportunity gap.

As the demands of discipline-specific discourse increase by high school, students fall further behind (Moje, 2008). In addition to their traditional academic subjects, they engage in highly technical learning experiences with demands of texts surpassing the level of difficulty of even their English literature readings. They are faced with the challenge of reading, writing, and discussing within an incredibly wide range of genres, audiences, and purposes, and have difficulty with transfer of these skills (Morrell, 2008). Rothstein (2004) discusses the important
of non-cognitive skills leading to success in college and career, and while students have the opportunity to gain these skills in their technical school-based setting, it is not enough to fill the gap between the types of non-cognitive skill growth valued in school compared to their family and community contexts (Gee, 2012). This contributes to a decrease in agency and motivation of the students, impeding their learning and opportunities to succeed. In my studies, I have spent time exploring the language, cultural, and economic elements that contribute to their literacy development. As an embedded element of transdisciplinary literacy theory is critical literacy theory, I utilize critical theories as a focus to better understand the literacy struggles of students who are not part of the dominant group and struggle with the mismatch between school and home literacies.

The second layer of my sociocultural considerations lies at the teacher level. This is an especially complex layer because teachers carry the role of being tangentially connected to my research as well as being my direct reports. There is an element of white privilege (DiAngelo, 2018; McIntosh, 1990) as a common thread that ties most of these teachers, including myself, together. With white privilege comes the unawareness and/or denial of factors that provide Whites with advantages over non-Whites, thus developing a distance between students and teachers. These widespread misconceptions and false assumptions, or “psychotic conceptualizations” (Minnich, 2005), have a detrimental impact on the learning experiences of marginalized youth. Beneath this common thread of white privilege, however, are a range of sociocultural factors that characterize individuals and subgroups of teachers in different ways and lead to further contextual complexities. I will discuss these factors of social class, educational background, and age in more detail within the third sociocultural layer because they are deeply interwoven within the larger institutional structure. Since I am an educator with White
privilege, I am a part of this group, and surely unconsciously experience my own barriers of understanding with students who are not part of the dominant group. Through studies in critical theories, the opportunity gap, and marginalized populations, I work to better understand these barriers that exist between the students and myself, as well as the category of the dominant group of educators that I fall within. At the same time, as the supervisor of the teachers in the program, I am cognizant about the potential impact of power roles on the research.

The third layer that I must consider is my own background as researcher and observer. Navigating the fine line between my dual roles is a challenge that I must always keep in consideration. The critical pedagogy perspective calls for teachers to engage in praxis, with the ultimate goal of education beginning in social justice (Morrell, 2008; Shor, 1992). Since critical pedagogy and critical theories in a broader sense have become so engrained in me, I feel a deep responsibility to ensure that my research has some level of influence as social justice. For this reason, I strive to take a transformative approach to research, as well as share my learning and findings with other educators to create even broader impact.

I also have had the experience of being a student, but I cannot personally identify with the sociocultural perspective that my students bring to the classroom because of the differences in my own sociocultural background. Rothenberg (2008) has helped me to uncover that I grew up during the age of “colorblindness,” putting blinders on to my own privileges and advantages that I have enjoyed as being a European American. Although I spent a portion of my high school education and my entire undergraduate education abroad in Greece, faced with adjusting to a different language and culture, I was never in a disadvantaged minority group. My experiences have helped me relate with students adjusting to a new language and culture, but my ethnicity has never been a barrier to learning. As an educator, my father ensured that I experienced a
literacy-rich home environment, putting a great deal of emphasis on education and language learning. My high school experience was in a diverse, multicultural setting, but all of my coursework was in an International Baccalaureate program that isolated high-performing students from lower-performing students. My classmates came from very privileged backgrounds, and those from traditionally disadvantaged groups tended to have exceptional backgrounds and opportunities. In an American college with native Greek students comprising much of the population, my background was considered attractive and unique. I then had no difficulty obtaining employment in a turbulent job market in Greece, as my fluency in the Greek language along with being a native English speaker were considered assets in the globalized world of business. Thus, my own background, heavy in advantages and opportunities, is a stark contrast to that of the students in an urban technical high school setting, yet another factor leading me to include an emphasis on critical theories in my studies.

Sociocultural elements exist within the student level, classroom level, and school-wide level (Alvermann, 2009; Franzak, 2006; Allan Luke, Woods, & Dooley, 2011), all of which are intertwined in their effects on each other and will be further complicated by the element of the researcher/observer. Differences from layer to layer result in an array of disconnections that are directly reflected in instruction and learning, and through a reconstructed lens are so interdependent and complex that they are difficult to discern. The implications of this mishmash of sociocultural perspectives have been guiding considerations throughout my research. Throughout every step of the process, I continuously ask myself: What are the sociocultural factors at play? Who is involved and how do they contribute to teaching and learning? What, if any, adjustments should I make to my conclusions based on these considerations? Through this process of continuous deconstruction and reconstruction, as well as study in critical literacy
theory, technical education, adult learning, and adolescent learning, and both the dominant and other groups that are elements of our hegemonic education system, I work to keep these factors in perspective while at the same time allowing them to inform my research in bringing to light the effects of sociocultural perspectives on the opportunity gap.

From a young age, I began to develop a sense of agency that grew stronger and stronger throughout the years. This agency developed because I was lucky to have the opportunities that my family offered to me and that my race and class allowed me to experience. At home, at school, and at my family’s restaurant, I had the chance to continuously encounter real-world problems and have access to the modeling, training, and time to practice and develop skills to solve the problems. I had the tools and space I needed to build and create with seemingly endless possibilities. These experiences only strengthened my agency, which in turn prompted me to seek bigger and more exciting experiences over time. And I had fun while doing it. But not all children have the luxury of the privilege I have enjoyed. How can public schools offer all students the chance to develop a strong sense of agency?

1.4 Problem and Purpose

As technical studies naturally lend themselves to hands-on, real-world learning, students can be deeply motivated by engaging in experiences with authentic audience and purpose. Secondary CTE schools provide students with a full education in academics as well as a career area of interest. Students have opportunities to apply their school-based learning in the real world through work-based learning. By learning to navigate through challenging technical and academic content, students have the opportunity to build higher order thinking skills transferrable to their academic and professional learning and ultimate success.
At the same time, secondary CTE students have historically been placed in a deficit model and marginalized from multiple perspectives. Formerly known as vocational education, CTE has traditionally had the reputation of being a dumping ground for students who have trouble academically and behaviorally. CTE schools tend to have a higher concentration of struggling adolescent learners as they are attracted to the hands-on, practical aspects of the trade and professional shop areas. Furthermore, since adolescence is generally accepted as being a period in development that involves psychosocial transitions related to personal identity, social relationships, and growth in higher-level thinking skills (Intrator & Kunzman, 2009), adolescents tend to be marginalized by being viewed as incomplete adults rather than having their own sense of agency within their own contexts (Alvermann, 2009; Lesko, 2012). When secondary CTE schools operate in urban settings, students are marginalized further due to class, color, and socioeconomic status (Greenleaf & Hinchman, 2009). There are many elements that contribute to this cycle of inequity, but one of the most significant is that these adolescents are perceived as deficient and are placed in the cycle of a deficit model (Christenbury, Bomer, & Smagorinsky, 2009b; Comber, 2011; Allan Luke et al., 2011; Marshall, 2009; Morrell, 2008; Rogers & Mosley Wetzel, 2014).

I have observed multiple systemic and structural barriers that have impeded CTE from reaching its full potential in pulling students out of deficit toward a model of hope and success. The most important, in my opinion, is the separation of the academic and technical disciplines in most secondary CTE schools in this State. Students learn about their chosen career area in isolation from their academic subjects, and often teachers from the academic and technical areas do not work together in any capacity to plan and teach the same students. This is a missed opportunity as the integration of the disciplines can contextualize the learning in ways that will
motivate students and take them to deeper, richer layers of learning. Furthermore, students are placed on a relatively narrow career path as early as age fourteen and can be locked in until they graduate high school. CTE legislation on the federal level calls for integration of the academic and technical disciplines, but from my experience and review of the CTE literature, it is not implemented in a way that is widespread or deep. My research and experiences drive my conviction that integrated, inquiry-based authentic learning is highly effective in impacting student learning and in cultivating agency.

There continues to be a lack of quantity and quality research in CTE education and a stereotypical deficit model that exists around this marginalized population. The sparse research on CTE integration, including integration between academic and technical studies as well as among career areas, indicates that there is not much progress in this area nationwide. Although I have put forth my best effort to make changes in schools in any ways that I can, there are overarching structures and systems that prevent any real change. These challenges continue to fuel my passion in my studies and practice, which eventually led me to my studies at Lesley University and my current role at Riverside Regional Technical School.

Three years ago, I had the opportunity to co-build a Science, Technology, Engineering, Arts, and Math (STEAM) program within this urban CTE school from the groundup. This has been a way for me to act on my desire to improve CTE and students’ sense of agency through a transdisciplinary, project-based model focused on real-world learning and action.

One goal of this study is to explore how students in this program experience transdisciplinary learning through their lens and voice, as well as the ways in which new and
existing systems and structures in the school interact with their experience and agency. By engaging in the research process alongside the students and encouraging the understandings to emerge through their experience, I hope to help bring out the powerful voices of this marginalized population and share them on a broader level. I also hope to contribute to the literature base on secondary CTE and encourage others to do the same.

1.5 Research Questions

The following questions guided my work throughout this study:

In what ways is student agency co-created in a transdisciplinary CTE innovation program?

How do institutional systems and structures support or hinder the development of student agency?

1.6 Organization of the Study

In this chapter, I discussed my own journey in the world of education and how it connects with my purpose and problems that I pursued in this study. In Chapter Two, I will review the literature in my areas of focus. More specifically, I will begin with a portrait of a successful high school graduate to illustrate the goal we work toward in secondary education, followed by a discussion about what has been done in American high schools, specifically CTE, to work toward that goal. Then, I end with a review of what education could be through reimagining the high school experience. In Chapter Three, I will explain my research design, setting and participants, as well as my data collection and analysis methods. Chapter Four will consist of the presentation of data and themes that emerged through the artifacts and reflections of the students. In Chapter 5, I will discuss my findings and offer an interpretive theoretical model of student agency development that is grounded in the data.
CHAPTER 2: REVIEW OF LITERATURE

2.1 Portrait of a Successful High School Graduate

In August of 2016, I gathered with the newly hired teacher team from the STEAM program at Riverside Regional Technical High School to create a common vision of a successful graduate of our program. This was part of our three-week professional learning/curriculum development that I was charged with planning and facilitating. Though we faced the challenging task of creating transdisciplinary curriculum, building relationships and team culture, and learning about a non-traditional way of teaching and learning in such a short time, I considered it to be critical to make time for this visioning process.

At this time, creating a portrait of a successful graduate was being done across multiple school districts in the area, and although I noticed that they all ended up being quite similar, it felt important to engage in that process as a team. Since there was limited time and the program had not yet begun, we were missing the key stakeholders of families and students as part of the process. Nevertheless, after much discussion and iterations, this is the portrait that we developed:

*Our vision is for STEAM graduates to be able to:*

- transfer knowledge to novel situations
- be comfortable with pushing themselves outside of their comfort levels to achieve new levels of learning
- use a growth mindset to break through barriers and exceed expectations
• use multiple personal and domain-specific perspectives to problem solve
• connect domain-specific knowledge to broad and relevant real-world contexts and issues
• use their knowledge towards a greater good to promote social improvement
• identify problems, create solutions, and defend their ideas using evidence and logic
• use precise language and appropriate domain-specific vocabulary orally and in writing to communicate
• collaborate with others using contagious enthusiasm, passion, and compassion
• reflect on their processes and products to gain deeper insights for possible improvement
• create goals for themselves that push them towards their best, based upon reflection and analysis
• be flexible in their thinking to allow for creativity and innovation
• engage in iterative processes of researching, experimenting, deducing, improving, and re-evaluating.

This portrait is consistent with the literature in the field about the skills needed for students to attain success in school and beyond. “In 1970, the top three skills that employers asked for were reading, writing, and arithmetic. In 2015, they are complex problem solving, critical thinking, and creativity” (Mehta & Fine, 2019). There is a call for a shift from basic skills to an emphasis on more complex, meta-skills that more closely match the ways in which our technological society is accelerating and expanding. As Ted Dintersmith (2018) articulates, “Machine intelligence is racing ahead, wiping out millions of routine jobs as it reshapes the competencies needed to thrive. Our education system is stuck in time, training students for a world that no longer exists. Absent profound change in our schools, adults will keep piling up on life’s
sidelines, jeopardizing the survival of civil society. While not preordained, this is where America is headed. Yet few understand (p.xvii).”

“Deeper learning” (Bellanca, 2015; Dintersmith, 2018; Mehta & Fine, 2019) is a popular buzzword in the realm of public education today. Bellanca (2015) provides the Hewlett Foundation’s list of the “six key attributes of deeper learning”: “master of core academic content”; critical thinking and problem solving; collaboration; communication in writing and speaking; self-directed learning; and academic mindset” (pp. 3-5). One additional element in this framework is “the transfer element” (p. 7), meaning the teachers instructing students on the ways in which they can transfer their learning in a particular context to others. Mehta & Fine (2015) describe deeper learning as “the intersection of the following three elements: mastery, identity, and creativity” (p. 15). After spending a year traveling across the United States and visiting innovative schools, Ted Dintersmith (2015) found four principles that commonly emerged in schools where he witnessed deeper learning, which he coined the “PEAK principles”- “purpose, essentials, agency, and knowledge.” (p. xx).

Looking back at our STEAM vision of a successful graduate, I see that our vision closely mirrors the authors’ descriptions of deeper learning. As I search online, I find that many other schools have similar goals. This leads me to wonder: why are these goals not reflected in the ways that schools operate? Why is deeper learning absent from so many public schools in the United States? According to Metha and Fine (2015), the lack of deeper learning in schools is a result of “historical and epistemological” and “structural” reasons (p. 35). In the next sections, I explore these questions and explain the historical/epistemological and structural considerations in more detail. I will begin by investigating perspectives on adolescence and literacy learning and CTE policy in the United States as these are factors that, depending on the perspective, can
act as barriers or supports to the actualization of deeper learning in schools. Then, I will explore frameworks for deeper learning that aim to reimagine the American high school.

2.2 Critical Perspectives on Adolescence and Learning

In this section, I begin by describing adolescence and perspectives on literacy learning as these concepts are at the center of my research. Then, I will focus my discussion on the areas of critical literacy and embodied learning as they are lenses through which I explore student agency. I will first define each perspective, then discuss their implications in two contexts: barriers in broader, systemic and structural level of schools, and recommendations from the literature for positive change on the individual classroom level.

Adolescence.

The term adolescent is a concept that was introduced into our common discourse only about 150 years ago and refers to the teenage years in human development. The concept of adolescence, and expectations of teenagers in society, varies across cultures (Christenbury et al., 2009b). According to the authors, due to the diversity of social and cultural contexts, the concept of natural development of adolescents is fictitious as adolescents have been traditionally cast in a deficit paradigm due to the assumption of biological determinism, despite the volume of research that refutes this claim. Instead of viewing adolescents as being incomplete in comparison to adults, they should be understood as having their own sense of agency within their own contexts occurring within their stage of development (Alvermann, 2009; Lesko, 2012).

In the United States, adolescence is generally accepted as being a period in development that involves psychosocial transitions related to personal identity, social relationships, and growth in higher-level thinking skills (Intrator & Kunzman, 2009). The literature in the area of
adolescent literacy learning indicates conflicting definitions of the beginning of the grade-level range included in adolescent literacy, from the fourth grade (H. Johnson, Watson, Delahunty, McSwiggen, & Smith, 2011), sixth grade (Lee & Spratley, 2010), or further questioning if it should pertain solely to high school beginning in the ninth grade (McConachie & Petrosky, 2010). Nevertheless, there is general agreement that adolescent literacy extends to the 12th grade (H. Johnson et al., 2011; Lee & Spratley, 2010; McConachie & Petrosky, 2010).

The concept of identity development is key in the adolescent years. It is a complicated stage in development as teenagers must contend with a range of identities as concurrently student and worker, considered both young and old (Christenbury et al., 2009b). Christenbury et al. (2009b) explain that the current generation of teenagers faces increased complexity of challenges, including faster maturity in a physical sense while later in financial and mental independence, as well as being the most school-based assessed group of youth in history. Contrary to widespread assumptions, teenagers desire strong relationships with adults, and these positive relationships are crucial to their identity development (Alvermann, 2009; Franzak, 2006; Intrator & Kunzman, 2009). Lewis & del Valle (2009) describe identity as an ideological construct that is socially, culturally, institutionally, and politically situated rather than as purely individual phenomenon. Though identity is dynamic, the common view of identity as a fixed concept can be harmful to marginalized groups who do not share features with the dominant group. Lesko (2012) describes the commonly applied frameworks of “development” and “socialization” as adding to the limitations in common viewpoints about adolescence.

This leads to deficit views of literacy and learning in students of non-dominant groups and is detrimental to their literacy development and consequent academic achievement (Lewis & del Valle, 2009). College and career opportunities for teenagers in marginalized groups based on
race and socioeconomic status are unequal (Christenbury et al., 2009b), and students who are stereotyped into this divergent category then tend to act according to the expectations that adults set for them, thus perpetuating their marginalized status (Alvermann, 2009).

Adolescence is critical time for identity and social development yet is marked with perceptions of deficit. In this next section, I will explore the two main perspectives on literacy development and various associated theories as they are deeply interconnected with viewpoints on adolescent social and cognitive development.

**Literacies and literacy learning: an overview.**

Literacy has been defined in a range of ways at different points in history, and these shifts have always carried social, economic, cultural, and political agendas (Gee, 2012). A range of differing theoretical frameworks and models of literacy have emerged throughout history in the United States and have had a direct impact on methods of literacy learning (Tracey & Morrow, 2012). According to Tracey and Morrow (2012), there is not one single theory or model of literacy that is superior to the others. Rather, the authors assert that it is important to consider multiple theoretical orientations when thinking about literacy and learning.

An exhaustive review of all these theoretical orientations of literacy is outside of the scope of my purposes in this chapter as my goal is to review the specific perspective of critical literacy. Thus, to define literacy for my purposes, I will discuss two categories of literacy perspectives that are discussed in the literature on critical literacy theory: autonomous and ideological views. Within these broad categories, I will discuss some relevant theories and provide some examples of classroom implications.
Autonomous views of literacy and literacy learning.

The more traditional, autonomous views of literacy assert that it is comprised of a globally accepted, isolated array of reading and writing skills that can be assessed in a precise, universal manner. Autonomous views of literacy are most closely associated with behaviorism. As Tracey and Morrow (2012) explain, behaviorism is rooted in the assumption that behaviors occur because of external stimuli, and that these behaviors can be altered by making changes to those external stimuli. Therefore, behavioral theorists view reading and writing as the main components of literacy that can be taught through drill of subskills that act as building blocks for reading, worksheet practice on discrete skills, and highly structured routines and rituals in the classroom (Tracey & Morrow, 2012). According to critical literacy theorists such as Alvermann (2009), Christenbury et al. (2009a), Comber (2011), Freire (1998), Gee (2012), Giroux (2011), hooks (1994), Langer (2009), Luke et al. (2011), and Morrell (2008), the autonomous view has a negative impact on literacy learning as it is narrow, fragmented, and neglects to address the range of multimodal literacies that students need to develop in today’s world. I discuss this range of literacies in the next section about ideological views of literacy.

Ideological views of literacy and literacy learning.

The ideological views of literacy build upon the autonomous to include variations of literacy with the understanding that it is deeply rooted in social and cultural contexts. Decades of research shows that the autonomous view of literacy is limited, consists of much more than just reading and writing and is not restricted to alphabetic print language (Alvermann, 2009; Christenbury et al., 2009b). While there are a wide range of ideological views of literacy, I highlight below the constructivist, cognitive-processing, and social learning perspectives as they are broad, foundational viewpoints that illustrate the ideological view.
Constructivist, cognitive-processing, and social learning perspectives.

As Tracey and Morrow (2012) discuss, constructivist theories are rooted in the assumptions that learning is continuous, occurring when the learner is actively engaged in the process, when new understandings are combined with existing understandings, and when inferences are made. The authors explain that in contrast with behaviorist assumptions, constructivist views assume that learning is an internal process. Therefore, as applied to literacy, constructivist views regard reading as a meaning-making process that learners actively construct themselves. One important constructivist theory that overlaps with critical literacy is inquiry learning, in which students actively engage in problem-solving in a collaborative context. Others are transactional reading theories, such as Rosenblatt’s reader response theory and Bakhtin’s notion of response, stemming from the constructivist ideological view of literacy. In this view, literate practices are considered a transaction between reader and text as an individual, meaning-making process that is an ongoing reflective conversation rather than a correct interpretation of a reading (as cited in Fecho, Coombs, & McAuley, 2012; Franzak, 2006; Lesley, 2008; Allan Luke, 2012). The application of transactional reading theories is beneficial to students who struggle with the dominant discourse of academic language, since it encourages them to draw on individual schemata to develop meaning, and then motivates students to widen the scope of their reading to develop identities as readers (Franzak, 2006).

The cognitive-processing perspective involves a focus on the invisible mental processes that occur within a reader’s brain (Tracey & Morrow, 2012). Cognitive models of reading that describe proficient reading as multiple strategic, cognitive actions that interact automatically as reader process texts; however, some critics of this view assert that it does not consider the
situated aspects of reading (O'Brien, Stewart, & Beach, 2009). Therefore, the cognitive paradigm cannot stand alone (Allan Luke et al., 2011).

Social learning perspectives have considerable overlap with other ideological views on literacy such as sociolinguistics, socio-cultural theory, social constructivism, social learning theory, and critical literacy theory. At the core of social learning theories is the assumption that social interactions promote learning (Tracey & Morrow, 2012). Lev Vygotsky (1978), the father of social learning theory and a seminal theorist in the broader constructivist realm, tells us that the elements of culture, social influences, collaboration, language, and adult interactions all work together to stimulate cognitive development. Thus, in applying this perspective to literacy definitions, literacy is inherently a social process.

More recently, the concept of literacy has broadened especially due to the concept of semiotics and advances in technology to include literacies in various types of communication such as visual, verbal, audial, and kinesthetic within cultural contexts. Terms used to denote this more comprehensive view of literacy are multiple literacies, situated literacies, and digital literacies, leading to the creation of New Literacy Studies (NLS) (Alvermann, 2009; Christenbury et al., 2009b; Comber, 2011; Gee, 2012; O'Brien et al., 2009; The New London Group, 1996). Langer (2009) uses the term “literate thinking” to describe more fully the ways in which people make meaning, decisions, and problem-solve through multiple modes of communication. Literate thinking also includes multiple perspective-taking and analysis of situations and is ultimately a social act that differs based on personal and cultural factor. It is also a foundation for teachers to begin from in guiding students’ learning.

The constructivist, cognitive-processing, and social learning perspectives on literacy learning place the learner at the center as an individual who makes sense of the world around her
through interacting with external stimuli. This human-centered way of thinking about cognitive and non-cognitive development gives power to the individual contrary to the deficit-centered autonomous views. In this next section, I will explore the critical literacy viewpoint as it directly challenges systems and structures that have roots in behaviorism and autonomous views on literacy.

**Critical literacy.**

Critical literacy is an ideological view of literacy that includes transactional theories, New Literacy Studies, and adds additional dimensions (Comber, 2011; Lesley, 2008). It uses literacy as a tool to develop individual and collective agency with the goal of social justice to critique and transform dominant meaning systems, and openly claims to be politically, culturally, ideologically, and sociolinguistically positioned to teaching and learning (Luke, 2012). Literacy, language, and education in general are inherently ideological, political, and can never be neutral or value-free (Comber, 2011; Freire, 1998; hooks, 1994; Janks, 2000; Luke, 2012; Morrell, 2008; Pace, 2006; Shor, 1992). Claims to neutrality in education only perpetuate hegemony and act as barriers to social change, and since power struggles are struggles over information and interpretation, a world that does not allow interpretation and critique suppresses human agency and freedom (Luke, 2012). According to Freire (1998), education is crucial to a democratic society, and should be viewed as a type of intervention in the world to maintain democracy through cultivating citizenship and ongoing questioning, critique, and praxis to continuously ameliorate social conditions. Since language is used as a tool of power and oppression, critical discourse analysis is a key piece of critical literacy to deconstruct these dominant discourses to expose power relations and raise questions about voice, motives, and empowerment/disenfranchisement (Janks, 2000; Luke, 2012; Rogers & Mosley Wetzel, 2014).
Critical literacy has roots in critical pedagogy, forms of community and adult education, literacy campaigns in postcolonial nations, and emerged in U.S. K-12 education in the 1980s (Rogers & Mosley Wetzel, 2014). Paulo Friere is credited as the father of the modern concept of critical pedagogy due to his education programs in Brazil in the 1970s (Luke, 2012), with his theory spreading to other postcolonial efforts such as the struggle against apartheid in South Africa (Janks, 2012). Critical literacy and pedagogy are grounded in feminist, postcolonial, anticolonial, (hooks, 1994) poststructuralist, and critical race theory, as well as critical linguistic and cultural studies, and finally, rhetorical and cognitive models (Giroux, 2011; Luke, 2012; Morrell, 2008).

Critical literacy and pedagogy should always be locally situated and continuously evolving due to historical, cultural, political, and social variables (Janks, 2012). Though it is a stance to teaching and learning rather than a prescribed program (Behrman, 2006), Janks (2000) identified four orientations to critical literacy: domination, the exploration of power, oppression, and inequality; access, providing a range of texts that reproduce both dominant and non-dominant discourses; diversity, exposure to different ways of thinking and knowing; and, design, the use of multimodal texts or semiotic systems. Her synthesis model integrates all the orientations, and as she asserts, they are interdependent and must all be present for critical literacy to realize its full potential.

Critical literacy and pedagogy aim to help students develop critical consciousness and equips them with tools to deconstruct systems and structures of oppression in the world around them. This viewpoint also fosters a sense of purpose in students as it calls for them to make sense of these systems and structures and question them. Next, I will explore the concept of embodied learning and the ways in which it intersects with critical literacy and pedagogy.
**Embodied learning and literacies.**

Theories of embodied learning overlap with critical theories and can be applied in a critical literacy lens on learning. According to Merriam, Caffarella, and Baumgartner (2007), embodied or somatic learning focuses on the importance of the body in our learning process, a concept that conflicts with the common Western view of the Cartesian split, that the mind is superior to the body in terms of learning. The authors explain that this artificial mind/body separation can be traced back centuries to Cartesian and Enlightenment thinking. As a result, we see this thinking perpetuated in present-day Western society as physical thinking and doing is regarded as inferior to cognitive, formal academic learning. Although there are different theories of embodiment, some of these theories seek to link the mind, body, and spirit in our understanding of learning itself. It is connected to experiential learning because it takes place through our reactions to experiences, resulting in meaning-making. As our bodies are involved in and react to situations, a chain reaction is set off that leads us to construct meaning within ourselves and in connection to the broader world around us; thus, fostering learning. As Woodcock (2010) asserts, the perpetuation of the mind/body dichotomy has a detrimental effect on individual agency, while in contrast, embodied literacy practices can foster agency.

Amann presents a model of embodied learning that consists of four pieces: kinesthetic, sensory, affective, and spiritual (as cited in Merriam et al., 2007). Kinesthetic learning is the dimension of somatic learning that occurs through movement of the body. Sensory learning is the process in which information is brought into our bodies through our senses and interpreted. Spiritual learning is concerned with our interpretations of “music, art, imagery, symbols, and rituals and overlaps or intersects with the other three dimensions” (Merriam et al., 2007, p. 195). Affective learning occurs when our emotions contribute to making sense of an experience.
Through studying the experiences of a struggling reader using tools from educational and psychoanalytic epistemologies, Boldt (2006) asserts that teachers should “insist upon placing human needs and desires - our own and our students’ - at the center of our practice” (p. 304). The author explains that due to the nature of society’s expectations regarding literacy proficiency, the demands lead to feelings of shame and anxiety that manifest as flooding emotions for struggling readers. In a set of essays by Boldt, Lewis & Leander (2015) published in *Research in the Teaching of English*, the authors share their views on the significance of affect in literacy teaching and learning for both teachers and students. They identify standardization of curriculum and an overemphasis on standardized testing as factors that create a cloud of anxiety over students and teachers. In her essay, Boldt urges teachers to resist the pressure of expectations of testing performance to lead them to view struggling learners as problems that need to be “fixed” instead of having the focus be on the individual learner’s development. There are some recent trends in literacy education shift to shift away from the neoliberal disembodied view toward a human-centered focus, and with a need for a greater consideration of sociocultural and political implications on learners (Leander & Ehret, 2019).

Attention on affective learning transcends the boundaries of literacy education across a range of disciplines and is not a new concept. For example, researchers at the MIT Media Lab, an interdisciplinary lab that has produced a range of notable innovations across many fields, published the *Affective Learning- a Manifesto* approximately 15 years ago. The authors argue that the overemphasis on cognitive learning that emerged with the rise of the computer, and specifically computer modeling to explain multiple phenomena, reduced learning to a focus on information processing at the expense of the affective dimension of learning (Picard et al., 2004).
The social construct of culture is an important element that is discussed in the literature on somatic learning. Through the theory of embodied cognition, Cheville posits that “the human body is at the intersection of culture and cognition” (as cited in Merriam et al., 2007, p. 196). She posits that culture is always present as we construct meaning from our experiences and cognitively reflect upon them, though the element of affect is an important aspect of embodiment that is absent from her discussion. In this view on embodiment, the human body that acts as a mediator between the culture and cognition, bringing the experiences in and assisting us in making sense of what is happening around us. Beckett and Morris (2001) explain the concept of ontological performance that emerged in their study of identity construction in two settings, highlighting the link between identity, learning, and the body (as cited in Merriam et al., 2007). In studying the identity of learners in two vastly different environments, they found that cultural factors in the individual are continuously being deconstructed and reconstructed through their interactions with others, resulting in learning about their own identities. Brockman (2001) discusses his somatic epistemology for education as a way to reimagine the center of learning with the aim of embracing universalism rather than relativism in teaching and learning, especially in multicultural settings. He explains that although a cultural-linguistic view of learning provides us with insight into the ways in which learning differs across contexts, it neglects the body as being the ultimate judge as to what should be accepted or rejected. This is a critical stance that can help us to cast aside any cultural belief systems and behaviors that are oppressive and physically harmful.

Brookfield states that critical thinking is a vehicle to examine “how we view power relationships in our lives” and explore “hegemonic assumptions” (as cited in Merriam et al., 2007, p. 146). Thus, an additional crucial layer of embodied learning is connected to our
intersectionality such as race, ethnicity, gender, sexual orientation, religion, and socioeconomic status. These aspects of our socially constructed identities contribute to power relations in society in the ways in which we view ourselves and the ways in which others view us, thus empowering or disempowering and having an impact on agency (Hughes-Decatur, 2011; Josselson & Harway, 2012; Woodcock, 2010).

Embodied learning adds an additional layer to the lens of critical literacy, and as Johnson and Vasudevan (2012) articulate, we should draw upon new understandings from research in multimodality and critical media studies to broaden “verbo- and logo-centric definitions of critical literacy to include how texts and responses are embodied” (p. 34); and, instead, view it as "performed, positioned, and produced" (p. 35). The authors caution against creating norms of school-based critical literacy that can be different than the literacies students perform in out-of-school contexts. The concept of embodiment connected to literacy provides hope in reimagining research and instruction in literacies (E. Johnson & Kontovourki, 2016). Just as transactional/constructivist theories describe reading as a meaning-making process between texts and readers, as Hughes-Decatur (2011) explains, our bodies help us to make meaning about the world around us as we continuously read each other’s bodies to construct meanings and understandings. This is deeply interconnected to concepts of self-image and identity, especially but not limited to adolescent girls, as they are in a state of constant tension with meaning-laden images around them associated with the dominant culture that they then internalize and utilize to interpret their bodies as “normal or deficient visual texts” (Hughes-Decatur, 2011, p. 72).

Thus, through the lens of embodied learning, bodies are viewed as “social texts” through which meaning is made (E. Johnson & Kontovourki, 2016). E. Johnson and Kontovourki (2016) suggest four ways in which literacies are embodied: “through disciplined literate subjects;
emotional, embodied literacy in discursive communities; bodies as social texts, represented and re-representing; and bodies ma(r)king possible affective, mobile, indeterminate literacy.” I will explore these themes throughout the following sections, to varying extents, as they apply directly in my discussion about aspects of critical literacy in schools.

Embodied and critical perspectives on learning give importance to multiple aspects of adolescent learners’ identities and help others to understand them more holistically. These understandings can allow for students to become powerfully situated at the center of their own learning in school in an intentional and deliberate manner. Unfortunately, there are multiple barriers in today’s schools that impact adolescents and their agency development.

**Barriers to embodied critical literacy in systems and structures of schools.**

One of the main goals of critical pedagogy is to promote agency in individuals to question systems and structures in society and take action to create positive change (Freire, 1998; Giroux, 2011; Luke, 2012; Morrell, 2008). The effects of many policies that concern literacy in schools result in oppression (Luke, 2012; Morrell, 2008) and the disembodiment of teachers and students (Enriquez et al., 2016). Woodcock (2010) argues that “school culture has a distinct history of and reputation for controlling bodies” (p. 360). The author asserts that control of students’ bodies can negatively affect their motivation, engagement, and act as a barrier to learning.

There are two broad aspects of systems and structures in school that are topics of focus and critique in the critical literacy literature: the era of standardization and ‘struggling’ learners.
Embodied critical perspectives in the era of standardization.

As Gee (2012) and Marshall (2009) discuss, the resurgence of autonomous literacy can be traced back to the beginning of the standards period in 1983 with the U.S. government report *A Nation At Risk*. This report was marked by language of urgency and alarm regarding the underperformance of teachers and students in the United States compared to other nations and called for consistency across the nation in terms of student achievement (Hamilton, Stecher, & Yuan, 2008; Harris & Herrington, 2006; Marshall, 2009). *A Nation At Risk* spurred a chain of policies that led to the *No Child Left Behind Act* (NCLB) of 2001 (Gee, 2012; Marshall, 2009) as well as the Common Core State Standards that were released in 2010 and have been adopted, though in various stages of implementation, in 45 states as of 2012 (Kober & Rentner, 2012).

The formulation of the Common Core State Standards can be traced back to the following key policy events: George W. Bush’s President’s Education Summit with the Governors in 1989 (Porter, McMaken, Hwang, & Yang, 2011), through which national education goals were developed (Hamilton et al., 2008; Watt, 2011); President Bill Clinton’s 1994 *Goals 2000: Educate America Act and Improving America’s School Act*, both calling for states to develop content and performance standards along with state assessments; and, the 2008 work of the International Benchmarking Advisory Group to examine international benchmarks for student achievement (Watt, 2011). As Watt (2011) explains, this 2008 work generated five action steps that acted as foundational building blocks to the Common Core State Standards Initiative: the development of national core standards in English Language Arts and mathematics; states providing resources to schools that are aligned with the standards; an increase of standards in quality of teacher preparation; state-level accountability of schools; and the measurement of student achievement against global data.
In Hamilton et al.’s (2008) review of the literature on standards-based reform systems, there are three themes that emerge: states continue to disagree on what should constitute the elements of strong content and performance standards, that “standards-based reform” has turned into “test-based reform” in that the assessments rather than the standards are the forces that drive instruction, and that standardized testing impacts the practice of teachers and administrators in both positive and negative ways. Concerns raised in this review include tension regarding decision-making driven by pressures of accountability at the state, district, and teacher-levels, that systems of punishment and rewards tied to testing can have negative effects on practice that ultimately do not support student learning, and that the current assessments do not address all standards. Thus, as Darling-Hammond (2004) asserts, the promising aspects of standards, such as higher rigor and equality across the nation to create positive reform, have been overshadowed by a growing literature base indicating that high-stakes testing and accountability have caused these “unintended consequences” (p. 1049).

Similar parallel movements occurred in the United Kingdom and Australia (Lakes, 2007; Allan Luke et al., 2011). From a critical perspective, the authors assert that these educational policies are a direct result of the rise of neoliberalism, or the political philosophy centered on privatization and deregulation, during this period along with further shifts toward a more market-driven competitive economy. This affects schooling as neoliberals assert that businesses and markets should control social policies and schools, thus reducing the federal role in education as well as social policies. As the global economy in the 1990s had less of a need for technical workers and a large demand for non- or semi-skilled service workers, legislation such as NCLB and the push of neoliberalism has led to a back-to-basics movement in schools. Diane Ravitch, a major contributor to the movement toward learning standards and standardized testing in the
1990s, shifted her philosophy in the following decade and became a vocal critic. According to Ravitch (2010), the back-to-basics movement is characterized by an approach to education reform through a one-size-fits-all philosophy and common standards for teaching and learning, ignoring local teaching and learning contexts and conflicting with research-based understandings of literacy learning.

The back-to-basics and standardization movement and the resurgence of neoliberalism contribute to the perpetuation of inequality in schools and disembodiment of learning through its philosophy and practices in instruction and assessment. Proficiency is currently defined through high-stakes, standardized tests that categorize students into different levels (Christenbury et al., 2009b; Darling-Hammond, 2010; O'Brien et al., 2009) and has led to the quantification of education (Rose, 1989). Rose (1989) asserts that these tests do not assess reasoning skills, but students’ exposure to this way of assessing particular skills, and consequently do not align with students’ true reading and writing abilities. He argues that these tests are especially dangerous since they assess such a narrow picture of learning that they take the attention of educators away from what students really need, and because they ignore the social contexts that exist in authentic learning. According to O’Brien et al. (2009) these categories set low expectations, trap students into forming identities as readers around them, and do not give students the opportunity to show their ability to read in multiple authentic contexts and draw upon their diverse sets of background knowledge. Furthermore, the resurgence of the autonomous view of literacy through standardization, in essence, standardizes the body as well (Hughes-Decatur, 2011). Traditional, structured notions of teacher-student roles are perpetuated through expectations of silence, staying physically seated, and controlling emotions within this paradigm of the disciplined body (Hughes-Decatur, 2011; E. Johnson & Vasudevan, 2012;
Woodcock, 2010). Through this lens of disembodiment, dominant meaning systems are maintained by limiting the body’s space for expression and the opportunity to engage in meaning-making to empower and foster agency.

A review of adolescent literacy research by Franzak (2006) indicates that mandated testing has a negative or no effect on literacy skills, that teachers spend too much time on test preparation, and that it fragments the curriculum (Marshall, 2009). These findings are reinforced more recently in meta-analyses of learning practices and their effect on student learning (Fisher, Frey, & Hattie, 2016). Since high-stakes testing has an impact on school score reporting and teacher evaluation, the phenomenon of test score pollution, or the narrow focus of overemphasis on test-preparation curriculum, is rampant. In terms of teaching and learning in the classroom, this phenomenon takes the form of lower rigor through drill of basic skills and rote memorization of tested subjects (Fu & Graff, 2009; Greenleaf & Hinchman, 2009; hooks, 1994; Johannessen & McCann, 2009; Marshall, 2009; Rose, 1989; Schoenbach & Greenleaf, 2009), authoritative, lecture-based instruction (hooks, 1994), and takes resources such as funds and time away from untested subjects such as the arts and history (Comber, 2011). A reduced emphasis on the arts and physical education disembodies learners and maintains the dominant discourse of power and oppression by removing opportunities to make meaning through the body (Hughes-Decatur, 2011). Within these tested subjects, the autonomous view of literacy perpetuates inequality through a narrow focus on the teaching, learning, and assessment of the dominant cultural ideology (Giroux, 2011). Thus, rather than as defined through narrow standardized tests, proficient reading should be viewed as a situated, multimodal practice as authentic purposes motivate students to read and make meaning of texts (O'Brien et al., 2009).
**Embodied critical perspectives on struggling learners.**

Dominant meaning systems that exist in American society, such as concepts of individualism and blame of marginalized populations, have been perpetuated by capitalism, the media, and politicians, leading to widespread ignorance that racial injustice continues to exist, thus maintaining issues of sexism, class elitism, and racism that have a profound effect on students’ learning (hooks, 1994; Rose, 1989). As hooks (1994) argues, language is at the center of domination as a symbol of oppression and cultural imperialism. In addition to language, the embodiment of marginalized groups contributes to this system of inequality as it reinforces dominant viewpoints on expectations and assumptions of their Othered bodies (Hughes-Decatur, 2011; E. Johnson & Vasudevan, 2012; Woodcock, 2010). Students from marginalized groups due to class, color, and socioeconomic status are denied access to quality education (Greenleaf & Hinchman, 2009). There are many elements that contribute to this cycle of inequity, but one of the most significant is that these adolescents are perceived as deficient and are placed in the cycle of a deficit model (Christenbury et al., 2009b; Comber, 2011; Comber & Kamler, 2004; Allan Luke et al., 2011; Marshall, 2009; Morrell, 2008; Rogers & Mosley Wetzel, 2014). As Darling-Hammond (2004) explains, a strong research base indicates the trend of social promotion that has been replaced by grade retention linked to standardized testing does not lead to higher achievement for struggling learners; instead, there is an increase in negative effects such as lowered self-esteem, special education referrals, “push-out policies” and dropouts.

Marginalized students are subjected to a transmission model of learning in which they are reduced to test-takers and consumers of knowledge (Darling-Hammond, 2010; Giroux, 2011; Shor, 1992) and disciplined in their bodies within the time and space of their schooling (E. Johnson & Kontovourki, 2016). Freire (1970) calls this concept the banking model of
education, meaning that students begin with empty minds that are filled by teachers with the dominant ideology (as cited in Freire, 1998; Gee, 2012; Giroux, 2011; hooks, 1994; Luke, 2012; Shor, 1992). This culture of positivism controls curriculum development and provides students with a narrow education, and students and teachers are made to believe that their learning, curriculum, and textbooks are value and context free (Giroux, 2011).

Franzak (2006) asserts that this cultural hegemony is reinforced in standardized testing of adolescents and results in bias toward White privileged students. Due to this narrow conception of academic excellence, a false meritocracy is created, and students who do not have the tools to conform to the dominant curriculum due to economic, cultural, and social reasons are labeled as deficient and cast aside (Rose, 1989). Consequently, the dominant literacy schema unjustly excludes and oppresses urban and impoverished populations (Morrell, 2008).

According to Worthy et al. (2009), higher-track classes tend to be taught by better teachers with high expectations for students, and the instruction contains more opportunities for critical thinking. Lower-track classes tend to be characterized by drill in basic skills, slower pacing, lower expectations for student achievement, and teacher-centered instruction. Social constructs such as race, gender, and class have an influence on the reader’s experience and connectedness to texts, and teachers often confuse students’ cultural identities as indications of deficiencies, (Franzak, 2006). Teachers tend to place blame on students and lack awareness of their differing expectations for marginalized groups, the effects on students, and connections to larger issues of equity (Comber, 2011; Fu & Graff, 2009; Worthy et al., 2009).

Teachers, students, and parents operate within these deficit discourses due to overarching systems and structures, and it is imperative that all groups break out of this cycle to close the achievement gap (Comber, 2011). The concept of research applied to literacy learning
cannot be reduced to quantitative data, and the current system of assessment through the search for the ‘gold standard’ and scripted interventions that are chosen simply because the data is easy to quantify are only contributing to the widening of the literacy gap (Christenbury et al., 2009b; Rose, 1989). The autonomous view of literacy sets forth a vicious cycle of deficit and blame, acting as a blinder to adolescents’ true motivations, abilities, and hopes (Christenbury et al., 2009b). Comber (2011) asserts that especially in today’s world, the fixed view of literacy within standardized testing is becoming increasingly contradictory to the needs of students and the evolving nature of literacy due to two factors: higher levels of student diversity in schools, and the explosion of new literacies that have come from technology. Furthermore, international research indicates that “Standard English literacy in and of itself is a necessary but insufficient condition for working-class and ethnically diverse young people to achieve higher education or find unemployment” (Comber, 2011, p. 8). Therefore, policymakers and schools should shift away from the autonomous to an ideological view of literacy, specifically through critical literacy theory, to break out of the deficit cycle and provide all students an equitable education.

Luke and Freebody’s (1990; 1999) Four Resources Model is a framework that can be helpful in thinking about language development and instruction. The authors present four learner roles that they assert should be fostered in students: Code-Breaker, Text Participant, Text User, and Text Analyst. The Code-Breaker role is focused on decoding text while the Text Participant role is about constructing meanings from text. The Text User role addresses active participation and interactions with text, and the Text Analyst role allows for students to deeply analyze individual text as well as across different texts. The four Roles are not meant to be focused on sequentially but instead should be simultaneously fostered in students. With this flexible framework in mind, teachers have a guide to ensure that they are encouraging the development
of different aspects of language in the learners and helps students become more metacognitively aware of their own development.

*Embodied critical literacy in the classroom: Promise of hope and agency.*

Critical literacy in the classroom is an opportunity to break from the deficit cycle of systems and structures in schools and empower adolescent learners by fostering student identity, choice, agency, citizenship, and risk-taking (hooks, 1994). Though current systems and structures in education tend to disembody youth, there exists the opportunity to refuse and reject this trend on an individual level and become agentic beings: beginning with an open dialogue on the importance of bodies in education and the perpetual meaning-making process (Hughes-Decatur, 2011).

Empowering pedagogy is multicultural, dialogic, and student-centered; it is teacher-facilitated, but executed openly and democratically with students (Shor, 1992). Both teachers and students begin establishing a classroom community through reflection and thinking critically about themselves, growing as learners alongside each other (hooks, 1994). Specific learning activities grow from continuous questioning, research, and problem-posing that emerges from reading, writing, and discussing topics from multiple perspectives and a range of multimodal texts with the intent of challenging dominant discourses and systems of inequality and oppression (Freire, 1998; Giroux, 2011; hooks, 1994; Janks, 2012; Morrell, 2008; Shor, 1992). Since students read a range of text types within a range of disciplines, they have the opportunity to access and critique the dominant discourse through critically analyzing language and content, while at the same time learning from non-dominant discourses and building new understandings (Behrman, 2006; Schoenbach & Greenleaf, 2009). Reading and writing are positioned as social rather than individual practices (Comber & Kamler, 2004) that encourages active participation.
by all students (O’Brien et al., 2009) and integrates digital literacies in meaningful, authentic ways (Alvermann, 2009; Gainer, 2012; Greenleaf & Hinchman, 2009). Consequently, critical literacy is not only about critiquing and deconstructing texts; rather, it includes reconstructing them in new digital spaces that create inclusion in authorship, ability to reach wide ranging audiences, and unlocking new, hybrid genres (Janks, 2012; Morrell, 2008). In addition, critical literacies as embodied ways of knowing, while not always conscious performance, can be acts of performance that are felt, expressed physically and emotionally, and act to create new ways of knowing about selves, others, and the world (E. Johnson & Kontovourki, 2016). Students should have a safe space to explore literacies that are relevant to their own realities to have the opportunity to engage in discussion about their bodies, from which they can make meaning in ways that help to create positive identities and new knowledge (Woodcock, 2010). This process of inquiry and reflection does not end with learning; rather, learning is the starting point to social action in the community as a way of publishing and spreading new knowledge (Morrell, 2008).

Within the critical literacy paradigm, students and teachers become transformers rather than passive consumers of knowledge (Giroux, 2011), with learning as a culturally responsive, co-constructed exploration of concepts and ideas that have real-world meaning and purpose (Intrator & Kunzman, 2009). Thus, students’ diverse home literacies are combined and valued in the classroom, adding layers of rich perspectives that benefit the learning of all students (Alvermann, 2009; Lewis & del Valle, 2009). This melding of dominant and non-dominant literacies has a positive impact on the motivation and engagement of traditionally marginalized students by increasing their curiosity and allowing them to connect personally to the curriculum (Intrator & Kunzman, 2009). In addition, students develop strong habits of mind, higher-order skills in critical thinking and problem-solving, and stronger academic knowledge and skills that
further impact their motivation (Shor, 1992). As Intrator & Kunzman (2009) assert, students’ involvement in decision making at both the classroom and broader school levels has proven to have a positive impact on school improvement, yet another example of the potential of critical literacy to move marginalized adolescents from the cycle of the deficit model into a paradigm of hope.

Perhaps one of the most significant barriers to bridging the opportunity gap that lie within critical and transdisciplinary paradigms are institutional contexts: the systems and structures that exist in the levels of government and policy, school districts, individual schools, and classrooms (Fecho et al., 2012; Giroux, 2011; Morrell, 2008). There is an alarming disconnect between educational research and policymaking in the United States, setting the nation apart from the more integrated practice common in many European nations that experience higher levels of educational achievement (Bogenschneider & Corbett, 2010). This disconnect is one of the major reasons why the NCLB and other legislation does not coincide well with research findings, perpetuating inequality and the opportunity gap.

2. 3 Career and Technical Education Policy: A Critical Analysis

Institutional systems and structures have a direct impact on individual and collective agency, as they dominate and control the choices and actions of both teachers and students. In addition, students do not all enjoy the same opportunities for education due to the opportunity cost or gap: a result of purported meritocracy, with unequal educational opportunity between the white privileged class and the marginalized, non-dominant classes (Darling-Hammond, 2010; Hill, 2006; T. Perry, Steele, & Hilliard, 2004; Russell, 2010). In Career and Technical Education
(CTE) settings, there is a need to examine these systems and structures to create equitable opportunities for all students.

Policies at the federal, state, and local levels have influenced the evolution of Career and Technical Education (CTE) and paralleled social, economic, political, and historical forces. Secondary Career and Technical Education refers to secondary schools, mainly traditional public as well as public charter, providing high school education in traditional academic subjects as well as technical content areas. CTE has also been referred to as vocational or technical education in the past, with the new term of CTE conveying the shift in this educational model to include not only training options in the trades, but career options in broader fields such as technology (Oakes & Saunders, 2011), such as engineering and medical assisting.

Formerly called vocational education, this alternative educational track has traditionally been geared toward preparing low-achieving, non-college bound students to learn a trade and immediately enter the semi-skilled workforce, thus representing a stigmatized, marginalized population (Rose, 1989). The Perkins IV federal policy of 2006 changing the name to Career and Technical Education reflects the aim for transformation into a high-quality, rigorous pathway for readiness in college, career, and citizenship (Oakes & Saunders, 2011). Although policy at all levels of government have prompted some model CTE schools that result in high academic and technical achievement as well as success in both career and college, many CTE schools have failed to successfully implement all the policy elements and continue to underserve this marginalized student population (Kidwai, 2011). The timeline of CTE policy, beginning in 1917, mirrors the political, historical, and social forces of the times.
The Vocational Education Act of 1917.

Though the concept of apprenticeship dates to ancient times, the modern notion of vocational education was conceived in the 20th century (Wonacott, 2003). In the dawn of the 1900s, schooling in the United States was reserved for the White elite, with less than 10% of the school-aged population enrolled (Rose, 2004). The concept of vocational education was established at the federal level through The Vocational Education Act of 1917, also referred to as the Smith-Hughes Act, in response to the nationwide shift toward compulsory education. This legislation provided funding for different types of educational tracks, leading to semi-skilled labor pathways or to intellectually challenging and post-secondary bound. Students were considered to have different levels of intelligence and capacity, often based on their ethnicity and class, and were placed in these different pathways accordingly. Thus, even though the Smith-Hughes Act was presented to the public as a way to provide more opportunities for education, it essentially narrowed them for many people (Oakes & Saunders, 2011) and resulted in the academic/vocational split in public education. Damon (2010) explains that Charles Prosser, who was active in the field at the time and now regarded as the father of vocational education, was largely responsible for this legislation through a report to the United States Congress. Damon notes that the Smith-Hughes act marks the first United States federal policy in the realm of CTE and the segregation of vocational students from general education students, as well as the separation of further policy and practice in the field through instituting separate Vocational Boards of Education at both the federal and state levels. Other than the mandate that funds must be used toward vocational teacher salaries, there were no accountability systems for spending of the money.
Compulsory education was introduced by the government in the United States mainly for economic and sociocultural purposes. While there were democratic movements at the time to provide access to education to the masses (Hill, 2006), this policy was enacted for reasons other than pure benevolence or efforts toward equality for the non-elite groups. On the contrary; the Smith-Hughes Act was enacted to maintain inequality in society and segregate based on race and class. The industrial revolution opened many semi-skilled jobs in the economic market that needed to be filled, along with a parallel influx of immigrants into the United States (Oakes & Saunders, 2011), thus creating the factory model that persists in today’s schools. Hill (2006) and Russell (2010) explain that compulsory education was a way to ensure that people had basic levels of literacy and mathematical skills to be equipped to enter the changing landscape of the labor market, and also to maintain a common cultural national identity with shifts in the racial and ethnic makeup of the country. A powerful ideological aspect of this policy was Emile Durkheim’s influential theory of division of labor, or that people are naturally unequal and are destined to fill a particular need in society (Russell, 2010); thus, the Smith-Hughes Act was a way to deal with the issues of race and class by socializing the purported intellectually inferior minorities and immigrants into low-level jobs (Oakes & Saunders, 2011). Language and culture are crucial to national identity, and the notion of citizenship in education is a way to access the dominant culture; consequently, this assimilation model affected policy and continued to grow in the 1920s-1930s (Russell, 2010).

In addition to the cultural implications of policy, Hill (2006) discusses the strong connection between economics and education in America. In a capitalist economy, the goal of employers is not to cultivate a society full of active, democratic citizens; instead, the priority is on acquiring complacent employees who do not question inequalities in class and power systems
and accept their pre-destined level of labor. Thus, the capitalist notion of the link between education and economy signifies not a desire to foster citizenship in all youth for future activism in society, but an acknowledgement that education provides opportunity for work with the purpose of providing for individual families and contributing to a prosperous economic system as a whole.

These sociocultural and economic goals are reflected in the enactment of the Smith-Hughes Act. It ensured the segregation of the elite while at the same time providing a system for the division of labor. Since employers prefer to hire people who have the necessary skills to lower their training costs (Hill, 2006), this policy provided for businesses and the economy as a whole. Though it was beneficial for students who otherwise would not have had any access to education, it marked the beginning of tracking on a federal policy level that continues to persist in schools today. As students are placed in educational pathways preparing them to go directly into the workforce or to continue to college, it can narrow their opportunities to change their area of focus. More specifically, in secondary CTE settings, students are placed in specific career tracks often in ninth grade and may not have the option of switching to another career area or have a limited time period in which to do so. While this is necessary for reasons such as the number of hours needed for certification in certain trades and hours required for cooperative education eligibility and provides an opportunity for deeper learning in a specific career area, the other disadvantageous results of this policy continue to impact CTE students.

*The Vocational Education Act of 1963.*

Following the Smith-Hughes Act, the next notable policy in Career and Technical Education came with The Vocational Education Act of 1963 which was amended in 1968, 1972,
and 1978 (Texas Education Agency, 2014). The Vocational Education Act of 1963 was propelled by social and economic conditions of the time. According to Mitchell (2011), the era beginning in the 1950s prompted shifts in education policy, specifically due to court decisions for racial desegregation beginning with *Brown v. Board of Education*; the Russian launching of Sputnik, resulting in a national sense of global competition to be addressed through a renewed focus on student achievement; and the rise of teacher unions. The period of the 1960s marked a transformative era in terms of civil rights progress and was reflected in education policy of that decade. The Vocational Education Act of 1963 carried the theme of racial, ethnic, and gender equality, accompanied by the less overt agenda of narrowing the opportunity gap to maintain an international stronghold, and mirrored those same areas of focus in the Elementary and Secondary Education Act in 1965. The most pivotal and influential piece of The Vocational Education Act of 1963 and subsequent amendments is in the emphasis on equality. Specifically, this policy mandated the use of federal funds to allow access to the curriculum for students of disadvantaged groups, including mental and physical handicaps; low socio-economic backgrounds (Damon, 2010; Threeton, 2007); bilingual; and those in career tracks not traditional to their gender (Wonacott, 2003).

**The Carl D. Perkins Act: New contextual landscapes for learning in CTE.**

The language of crisis regarding student preparedness for the workforce in *A Nation at Risk* (1983), coupled with the shift from industrialization to the age of technology, prompted the Carl D. Perkins Vocational and Technical Education Act of 1984 (Damon, 2010). Subsequent reauthorizations of the Perkins Acts in 1990, 1998, and 2006 (Perkins II, III, and IV), reflect economic shifts in a steadily increasing technology-based market and the educational climate of
standardization and accountability (Damon, 2010; Lakes, 2007; Threeton, 2007; Wonacott, 2003).

According to Rob Riordan, co-founder of High Tech High, parallel to the Perkins Acts was the School-to-Work Opportunities Act of 1993 and focused on the integration of career and academic training. There were two significant projects that sprouted from this legislation: the New American High School and the New Urban High School. “In these projects there was something approaching an equivalency between college and career education—technical skills were on a par with academic skills—or the distinction between the two was seen as a false dichotomy. The Act reached its planned sunset in 2001. NCLB was the nail in the coffin, as there was no equivalency—vocational students had to achieve proficiency on standardized tests, but “academic” students were not required to develop any technical (or career) skills” (personal communication, March 16, 2019). Unfortunately, the emphasis on accountability and testing associated with NCLB not only made work on academic and technical integration grind to a halt, but also took the focus away from student learning.

The reauthorization of the Perkins Act in 2006 was a tumultuous process for political reasons. In his political analysis, Lakes (2007) describes the standardization, privatization, accountability, and reduction of social policies in education as the “conservative restoration… a right leaning hegemonic alliance among two groups: neoliberals and neoconservatives” (p. 109). While neoliberals and neoconservatives found common ground in their mutual interest in the standardization and heightened accountability in education, they have conflicting viewpoints on a variety of topics, including Career and Technical Education. Thus, a battle between neoliberals, who argue for market control and reduction of federal interventions in school and society, and neoconservatives, who aim to preserve the traditional federal role in schools, threatened the very
existence of vocational education. Lakes explains that the Bush Administration tried to block the Perkins reauthorization with support from neoconservative interest groups, such as the Fordham Foundation, and had plans to phase out funding and eventually eliminate vocational education because of the renewed focus on academic achievement. The reauthorization eventually passed through Congress and was instead crafted to promote and reflect the NCLB agenda. Lakes outlines four neoconservative motives carried by Perkins IV: modernization, competition, alignment with NCLB, and accountability.

Especially through the Perkins IV reauthorization in 2006, education reform in vocational education aims to reinvent its image as Career and Technical Education (Kidwai, 2011), from an alternative route to receiving a high school diploma for students who did not fare well academically, to a high-quality, rigorous pathway for readiness in college, career, and citizenship (Oakes & Saunders, 2011). To promulgate this effort for a new identity, Perkins IV changed the name of vocational education to Career and Technical Education, and professional organizations supported this shift through the renaming of the *Journal of Vocational and Technical Education* to the *Journal of Career and Technical Education* (Oakes & Saunders, 2011). Career and Technical Education today is funded at the federal, state, and local levels (Wonacott, 2003), and is overseen by the federal Office of Career, Technical, and Adult Education (OCTAE). Data from a range of studies indicate that there is no statistical difference in achievement or college preparedness between CTE and non-CTE students; nevertheless, there continues to be a stigma associated with technical education (Dare, 2006).

Perkins IV in 2006 mirrored priorities of the No Child Left Behind Act of 2001 and set forth additional mandates that have immense impacts on teaching and learning in CTE schools. Two important, interrelated components of NCLB that affect CTE policy and schools...
are accountability and standardization (Lakes, 2007). Students in these settings are required to meet the same academic standards as students in traditional high schools as evidenced in high-stakes standardized assessments that are requirements for graduation (Damon, 2010; Stephens, 2011; Threeton, 2007; Wonacott, 2003). Phelps (2002) discusses other requirements of NCLB that also extend to CTE schools: teacher quality, professional development, and gender equity.

Perkins IV, as the first federal CTE legislation tying funding to accountability indicators (Damon, 2010; Stephens, 2011), adds additional layers of accountability to schools in addition to being held responsible for all NCLB-related mandates. Besides demonstrating performance in academic skills on high-stakes assessments, CTE schools are charged with meeting indicators of: number of students enrolled in postsecondary training and education; number of students obtaining employment; and performance in technical competencies (Damon, 2010). Perhaps the most significant theme in Perkins IV is the demand for integration of technical and academic skills (Morgan, Parr, & Fuhrman, 2011; O'Connor, 2012; Rose, 2004).

On July 31, 2018, the continued value and importance of Career and Technical Education was reinforced by the signing of the Strengthening Career and Technical Education for the 21st Century Act, or Perkins V (Advance CTE: State Leaders Connecting Learning to Work, 2019). Focused on increased access to CTE programs of study for broader populations of students, a balance of power on the federal and state levels in CTE implementation, and clearer definitions and accountability, this most recent reauthorization of Perkins does not provide the same amount of groundbreaking changes to CTE as Perkins IV; rather, its significance as a policy document lies more as evidence of the federal government’s support for CTE programming in the United States (Advance CTE: State Leaders Connecting Learning to Work, 2019).
From policy to implementation: Effects of CTE legislation.

The damaging practice of tracking was formalized at the federal policy level with vocational education and was a direct result of The Smith-Hughes Act in 1917. According to Wonacott (2003), although vocational education was presented to the public as a way to democratize education, it created multiple levels of liberal and vocational tracks, perpetuated a class system based on race, ethnicity, and socioeconomic status, and set the stage for the academic and technical divide.

Though the Smith-Hughes Act was enacted over 100 years ago and a large body of subsequent research indicates that tracking has negative effects, it is still a contested issue in schools today. In the context of schooling, the term “marginalized” is a socially-constructed concept to describe students who struggle with academics connected to their background that set them apart from the dominant cultural schema (Franzak, 2006). Marginalized students are labeled as struggling learners and are subjected to discrimination and segregation through the practice of tracking, or ability grouping, that sticks students with a label of deficit has been found to have a negative effect on students socially, academically, and cognitively (Cooper & Jackson, 2007; Fu & Graff, 2009; Gee, 2012; Intrator & Kunzman, 2009; Luke et al., 2011; Rose, 1989; Worthy et al., 2009). Students who are placed in lower tracks tend to have scored low on culturally and socially biased assessments, such as IQ and standardized tests (Rose, 2004; Worthy et al., 2009), and/or come from racially and ethnically diverse backgrounds, as well as low socio-economic backgrounds (Fu & Graff, 2009; Gee, 2012; Intrator & Kunzman, 2009; Rose, 1989; Worthy et al., 2009). Socially constructed findings, based on assessment data resulting from NCLB, are that struggling adolescent learners tend to be of low socioeconomic background, of racial or ethnic minority groups, English Language Learners, and/or boys. These
groups struggle with academic literacy because there is a mismatch between their primary and school-based discourse communities (Fu & Graff, 2009; Gee, 2012; Johannessen & McCann, 2009; Lesley, 2008; O'Brien et al., 2009); thus, since research shows that literacy-rich home environments and parents' educational background in the dominant discourse have a significant impact on children's success in schools, then tracking, racial and class-based inequity is perpetuated (Gee, 2012). Their embodied experiences that can be empowering outside of school are stripped of value, silenced, disembodied, and lost in the classroom (E. Johnson & Vasudevan, 2012). As stated previously, this phenomenon is referred to as the opportunity cost or gap: a result of purported meritocracy, with unequal educational opportunity between the white privileged class and the marginalized, non-dominant classes (Darling-Hammond, 2010; Hill, 2006; T. Perry et al., 2004; Russell, 2010).

Students who carry the deficit label are also placed in pull-out intervention programs for remediation in math and reading for ‘at risk’ youth that have proven to be ineffective (Cooper & Jackson, 2007; Johannessen & McCann, 2009; Rose, 1989). According to Greenleaf & Hinchman (2009) and reflected in NCLB, American schools look for quick solutions and reject research recommendations and programs that do not ‘remediate’ students within one year, instead of accepting models such as the successful New Zealand intervention that puts emphasis on more sustainable, authentic learning. Thus, reading intervention programs are characterized by a heavy emphasis on basic skills and drill (Johannessen & McCann, 2009) and rote memorization, especially in terms of learning phonics and grammar in isolation, though research over the past hundred years has shown that it does not transfer to improved reading and writing (Rose, 1989). Due to the nature of pulling students from other classes for remediation, they are denied the opportunity to learn a range of academic disciplines (Cooper & Jackson, 2007), acting
as a barrier to students’ opportunities to build discourse knowledge and engage in critical reading and writing (Rose, 1989). Consequently, this leads to the widening of students’ learning gap and creates the phenomenon of “segregation by intellectual rigor” or “pseudoinclusion” (Greenleaf & Hinchman, 2009, p. 6).

The negative effects of tracking and remediation on students are multilayered and shattering. Days full of remediation have a negative effect on their motivation, engagement, and lowers their self-concept as learners (Cooper & Jackson, 2007) and sense of agency (Morrell, 2008) at this crucial stage of identity development. This occurs because students lack personal connectedness to learning activities (Intrator & Kunzman, 2009) that are not engaging or cognitively stimulating and do not allow students the opportunity to apply learning in meaningful ways (Johannessen & McCann, 2009). These marginalized students are further affected by awareness of negative perceptions toward them by other students and teachers, leading them to feelings of; shame, isolation, and failure; low-self concepts as learners and behavior issues, and, in turn, leading to dropout and long-term limitations in career goals and opportunities for college (Morrell, 2008; Worthy et al., 2009).

Perkins III, IV, and V represent efforts to bring Career and Technical Education out of the margins and toward a more positive, respected image. Though progress has been made, CTE continues to be a marginalized educational track.

**Mending the academic/technical divide: Opportunities for student success.**

In the seminal 1916 text, *Democracy in Education: An Introduction to the Philosophy of Education*, John Dewey described education as essential for the working of a democratic society, and argued for integration of liberal and vocational education through authentic, hands-on,
inquiry-based learning contexts (as cited in Wonacott, 2003, p. 7). Rose (2004) argues that society must reverse the artificial notion of the mind/body dichotomy and acknowledge the complex cognitive and physical demands on blue-collar and service workers. Though 20th century federal policy led technical education further into the mind-body separation and caused a schism between academic and technical education, the call for integration in Perkins IV provides opportunity for CTE to rise from deficit to opportunity. A range of research studies indicate that the most effective Career and Technical Education programs that best prepare students for college and career are those that pair rigorous academic and technical studies (Dare, 2006), and many researchers and educators promote the end of the artificial separation (Bray, Green, & Kay, 2010; Darling-Hammond, 2010; Lakes, 2007; Oakes & Saunders, 2011; Rose, 2004). These advocates also discuss a range of unique advantages for integrated CTE due to opportunities for authentic learning in real-world, problem centered contexts: student choice to cultivate curiosity; developing higher-order thinking, academic, and employability skills; fostering 21st century learning skills of critical thinking and problem solving, communication, collaboration, and creativity and innovation skills; increased sense of agency; evidence through performance- and portfolio-based assessment; and, increased student motivation, achievement, and postsecondary success.

In 2015, Achieve Inc. and the National Association of State Directors of Career Technical Education Consortium (NASDCTEc) co-authored the report *Building a Strong Relationship between Competency-Based Pathways and Career Technical Education*. In this brief, they discuss the missed opportunities for meaningful student learning due to the academic and technical divide in CTE and look to competency-based pathways (CBP) as a way to break down the silos and allow students a personalized educational experience grounded in real-world
They recommend the following structures be instituted in CTE schools to support this vision: “Contextualized learning environments for all students; self-directed pathways anchored in students’ career interests and inclusive of the full breadth of CCR knowledge and skills; high-quality experiential learning opportunities that allow students to apply their learning in real-world contexts; project-based learning as a platform for contextualized teaching, student-directed pathways, and experiential learning; and CTE as a component and complement to CBP assessment systems that authentically measure student learning (Achieve Inc & National Association of State Directors of Career Technical Education Consortium, 2015, p. 1).

The literature base in CTE and literacy skill integration is sparse; however, a study by Park & Osborne (2007) that integrated explicit reading instruction in high school Agricultural Science courses found that this method not only increased students’ content area performance, but also had a positive impact on students’ attitudes and motivation to read. Furthermore, authentic, integrated CTE experiences result in higher expectations and equity for all students, as well as increased postsecondary attainment for special populations compared to traditional secondary education (Oakes & Saunders, 2011; Wonacott, 2001). Unfortunately, there are very few recent studies on academic and technical integration and even fewer that have a level of depth and rigor that would help to inform our understandings about the effects and best practices in academic and technical integration. The CTE field is in dire need of quality research, especially in academic and technical integration.

*Challenges for teachers and schools in CTE reform.*

Though seemingly endless opportunities for student learning lie in integration of the academic and technical disciplines in CTE, many technical schools in the United States have not
made the appropriate shifts over the past few decades (Kidwai, 2011). One of the major causes of this problem is that the demands of technical education reform pose significant challenges for teachers. Since the definition of “highly qualified” under NCLB only applies to “core academic areas”—including the arts and foreign languages— it does not apply to technical teachers, leaving it to the discretion of individual states and resulting in disparities in CTE teacher preparation (Phelps, 2002). Many teachers, both academic and technical, lack education in integration as it is virtually absent from teacher preparation programs (Meeder & Suddreth, 2012; Morgan et al., 2011; O'Connor, 2012). This lack of preparation leads to hesitation and even resistance to integration stemming from a lack of understanding that academic and technical skills are the responsibility of all teachers regardless of content area (Meeder & Suddreth, 2012; Threeton, 2007). A report by Achieve, Inc. that surveyed state-level coordinators of Common Core State Standards (CCSS) and CTE directors in 22 states found a gap in integration. Nevertheless, eight themes for successful execution were uncovered: “developing a common understanding of college and career readiness; forming cross-disciplinary teams for CCSS planning and implementation; ramping up communications and information sharing; creating or updating curricular and instructional resources; enhancing literacy and math strategies within CTE instruction; fostering CTE and academic teacher collaboration; establishing expectations for and monitoring CCSS integration into CTE; and, involving postsecondary CTE in CCSS implementation” (Meeder & Suddreth, 2012, p. 3). Just as the literature base in general teacher education and professional development indicates, teacher professional development and ongoing collaboration in CTE is paramount for student success (Morgan et al., 2011). Hence, although all of the eight strategies for effective integration place responsibility on teachers, school structures provide them with little to no opportunity for professional development or time
for collaboration regarding curriculum, instruction, and assessment (Bray et al., 2010; Meeder & Suddreth, 2012; Morgan et al., 2011; Park & Osborne, 2007; Stephens, 2011) due to a lack of specificity in Perkins IV. Perkins V provides clearer guidance regarding elements of quality professional development but does not mandate or give any specific recommendations of how to implement and make time for more meaningful professional development (Advance CTE: State Leaders Connecting Learning to Work, 2019).

According to Achieve & the National Association of State Directors of Career Technical Education Consortium (2015), the following elements can support schools in successful integration and CBP implementation: “incorporating CTE at the outset to break down the deeply entrenched silos that exist at every level of the education system, particularly between CTE and academic leaders and educators; ensuring equitable student access to high-quality CBP across CTE areas; building capacity for districts, schools, and educators to transition to an integrated CBP system; overcoming data and reporting challenges to capture student proficiency where it happens, including beyond the traditional school walls; recognizing that some elements of CTE programs are still beholden to time; and, crafting a thorough, well-executed communications plan to build shared buy-in and common understanding among key stakeholders” (p. 1).

Further policies and programs need to be implemented to address these barriers to integration, as well as research that is virtually absent on the topics of CTE licensure and preparation, in addition to CTE academic and technical integration.

2.4 Reimagining the High School Experience

In this section, I will begin by reviewing one of the key factors for school reform: a redefinition of the role of teachers in public education along with the professional learning
needed for this transformation to occur. Then, I will explain the notions of Discourses and
disciplinary literacy as they relate to transdisciplinary learning. I will continue by discussing
transdisciplinary approaches to deeper learning. Finally, I will briefly look to successful
examples outside of the United States.

Teacher professional learning.

Teachers have the special responsibility of educating youth and guiding them toward
growth as agentic citizens of the global community. As founder of High Tech High Robert
Riordan states, “Schools must foster teacher agency if they hope to develop student agency”
(personal communication, June 14, 2014). Thus, if we want our children to develop into
strategic, independent, flexible critical thinkers and problem-solvers who act to make a positive
impact on the world, then we must focus our efforts as teacher educators to foster this kind of
thinking and action in teachers.

Since research indicates that the most important school-based factor for student learning
is the teacher, it is imperative that the role of teachers shifts to agentic and transformative
(Darling-Hammond, 2010). It is ironic that although technology is becoming ever-present in our
global world and inequality continues to plague our society, there is resistance in the field of
education to follow this shift through embracing the ideological view of multiliteracies and
critical views of literacy (Alvermann, 2009). Critical researchers indicate that teacher preparation
and ongoing, consistent professional development should be grounded in teacher inquiry and
reflection (Fecho et al., 2012; Shor, 1992) to develop critical consciousness (Giroux, 2011), or
conscientization (Freire, 1998). Giroux (2011) explains that in the frame of critical
consciousness, teachers should be viewed as cultural workers who must continuously reflect on
their own biases, the dominant meaning systems, and the contexts surrounding the specific
educational environment to develop pedagogy that will inspire students to think critically about themselves and the world.

Especially before and while teaching in diverse, urban areas, teachers should participate in preparation programs and workshops that begin with a deep exploration of the local linguistic and cultural funds of knowledge such as through home visits, discussion, writing, and critical discourse analysis to ensure that their curriculum is inclusive and culturally responsive (Comber, 2011). Teachers should also shift from a paradigm of disconnection to a classroom community of connection with students, including showing their vulnerabilities as human beings, caring for students’ well-being, conveying the feelings of joy and emotion in learning (Freire, 1998), and healing the mind/body dichotomy to educate the whole child in mind, body, and spirit (hooks, 1994).

Progressive teachers, both in K-12 and higher education, have a responsibility to oppose the bureaucratization and deskilling of their profession, or domestication, as well as the reduction of teaching to just technique and method from a purely scientific perspective (Freire, 1998; Giroux, 2011). Researchers and practitioners in the field of literacy must become more proficient in the language of policy, as well as develop a critical language to counter these issues, to be armed to fight for political change (Morrell, 2008). According to Emdin’s (2016) concept of reality pedagogy, curriculum should always be created by teachers with their own students in mind. To attempt to standardize curriculum is to perpetuate inequity in schools.

“Adults construct meaning and use learning as a means of adopting different ways for thinking, feeling, or acting” (Wang, 2008, p. 29). Passive learning does not amount to much learning at all, and it is crucial that we design adult learning experiences that challenge the learners to continuously construct their own meanings and create new knowledge. School leaders
and coaches should look to approaches for learner-derived curriculum development: andragogy, self-directed learning, reflective practice, social learning, and collaborative learning (Wang, 2008).

Knowles’s (1980) theory of andragogy reminds us of the power of self-directed learning and collaboration as critical foundational elements for adult learning: “adults need to understand why they are learning something, before they will attain ownership in the learning process; adults have a sense of responsibility for their learning; adults’ experiences should be valued; adults have a readiness to learn; adults are life-centered learners; adults are internally motivated” (pp. 57-63). Essentially, adults, just like adolescents, learn best when the learning is relevant, meaningful, and useful to them.

Wang (2008) cautions us against the many pitfalls to avoid in planning adult learning experiences. The use of lectures for delivery of material without time built in afterward for reflection and transfer of learning is extremely ineffective. Learners return to the busy routine of day-to-day work and do not implement the new learning. Another issue is in sending everyone to the same training, regardless of whether it is needed by everyone. Finally, there is an overreliance on having external ‘experts’ facilitate professional development with the risk of overlooking exceptional expertise that exists within the organization. Conducting a needs assessment and truly listening to the needs of learners is paramount.

**Transdisciplinary learning contexts and approaches.**

Transdisciplinarity is a broad term that is used to describe approaches to research as well as teaching and learning. In the realm of research, it refers to transcending rigid, disciplinary boundaries and engaging in inquiry beginning with real-world problems, then utilizing tools
from a range of disciplines to solve these problems (Leavy, 2011). In the field of education, it is a form of curriculum integration that begins with student inquiry into a theme or problem in authentic contexts, drawing content from a range of disciplines to facilitate learning. Put simply, the goal of integrated curriculum is for students and teachers to make connections between content and the real world (Drake & Burns, 2004).

**Discourses.**

To understand the purpose for shifts toward curriculum integration, I consider it important to briefly discuss the notions of Discourses and the disciplines. According to Gee (2012) "Discourses are ways of behaving, interacting, valuing, thinking, believing, speaking, and often reading and writing, that are accepted as instantiations of particular identities by specific groups...they are socially situated identities" (p. 3). Discourse communities led to the development of disciplines in education that became more and more specific over time, resulting in the compartmentalization of knowledge and a hegemonic curriculum (Minnich, 2005). Thus, as Leavy (2011) asserts, the promise of a transdisciplinary shift toward a problem-centered, integrated view of knowledge has the potential to blur the boundaries of the disciplines.

Drake & Burns (2004) explain that curriculum integration exists in a range of forms characterized by the extent to which the disciplines are combined, with the transdisciplinary approach as the most integrated form. They assert that integration leads to more engaging curriculum that is relevant to students’ lives and the world around them, providing them with both academic and life skills. Though the authors discuss multiple paths to implementing transdisciplinary learning, I will focus on problem-based learning as it directly applies to my pilot study.
Gee (2012) explains that everyone develops a primary Discourse, or private identity, beginning in childhood that can stay relatively the same, develop, change, or disappear. As people move past childhood, they develop a range of secondary Discourses, or public identities. People bring their other Discourses to any given Discourse in which they perform, leaving room for individual agency. Thus, as Janks (2000) asserts, people hold multiple identities within different Discourses that may clash in varying degrees, such as in the struggles of marginalized student populations between home-based and school-based Discourses.

The concept of Discourses led to the development of disciplines in education that became more and more specific over time, resulting in the compartmentalization of education and knowledge (Minnich, 2005). Current efforts are being made to reverse this phenomenon, in the realms of research and education, through the notion of transdisciplinarity to shift toward a problem-centered, integrated view of knowledge (Leavy, 2011). Minnich (2005) explains that some shifts have been made in higher education to a more transdisciplinary and diverse curriculum, however, this transformation of knowledge has not yet trickled down to K-12 education. Disciplines in the middle and high school grades remain highly departmentalized and maintain unique rules and frameworks within a hegemonic curriculum (Shanahan & Shanahan, 2008), contributing to the gap in opportunity to learn (T. Perry et al., 2004).

Critical discourse analysis in the classroom is an important way to begin unlocking the relationship between power and language (Allan Luke, 2012; Rogers & Mosley Wetzel, 2014).

**Disciplinary literacy.**

The concept of disciplinary literacy emerged as a specific, applied representation of the broader notion of Discourses. Disciplinary literacy is a term used to describe a rethinking and expansion in the concept of content literacy to include the unique, specific demands of literacy in
the disciplines (McConachie & Petrosky, 2010). The concept of disciplinary literacy has emerged as a response to the need to improve adolescent literacy (Shanahan & Shanahan, 2008). A consequent focus on content-area literacy followed, with a focus on the use of generic reading strategies typically used in the elementary grades applied directly to content-area subjects of middle and high school (Draper & Broomhead, 2010). This method of content-area literacy instruction was also unsuccessful due to the complex literacy demands of the disciplines that cannot be met through teaching reading comprehension strategies in isolation (Lee & Spratley, 2010).

Lee & Spratley (2010) assert that although disciplinary literacy is associated with the shift from learning to read to reading to learn, it should not be merely a tool for learning in content-area subjects, but the central goal of learning in the disciplines (Draper, 2008). Recent studies in disciplinary literacy have begun to uncover the specific, unique nature of literacy in each area of learning through collaborations between literacy experts and specialists in the disciplines, although this body of research is still in a phase of development (Draper, 2008; Draper & Broomhead, 2010; McConachie & Petrosky, 2010; Shanahan & Shanahan, 2008). Some research studies cite that a balance of instruction in literacy tailored to each discipline in combination with continued instruction in general literacy comprehension strategies in appropriate, selective contexts is an effective route in improving adolescent literacy (Buehl, 2011; H. Johnson et al., 2011). National reading and writing achievement data as well as studies in the field indicate that not only struggling readers, but students of all levels of achievement and ability levels require direct, explicit instruction in disciplinary literacy across the academic content areas to attain success (Lee & Spratley, 2010).
Proponents of disciplinary literacy present it as a form of critical literacy (Moje, 2008) in that it aims not to instill or build knowledge in students about the disciplines, but rather challenges students to deconstruct it to understand how knowledge sets are developed and fashioned within those disciplines (H. Johnson et al., 2011; Moje, 2008). This process makes the discourses transparent and invites conversation and thinking within the classroom community (Schoenbach & Greenleaf, 2009), while allowing students to access and create new knowledge by drawing upon language and cultural understandings, within the expanded discourses of new media literacies (Blake Yancey, 2009). The concept of fostering identities as readers and writers within each specific discipline carries the purpose of guiding students in developing the specific lenses needed to learn as apprentices to experts in the fields of the academic disciplines, such as science and history (Buehl, 2011) and contribute to the development of individual and collective agency. Further to the development of literacy identities of students in the disciplines for the purpose of learning how to navigate within them, these identities lead to critical thinking skills and the concept of becoming metadiscursive, or understanding the meanings within discourse communities as they relate to power and social positioning (Moje, 2008).

The development of disciplinary literacy skills, specifically in critical thinking, lead students to success in college, career, and citizenship (Lee & Spratley, 2010), stemming from some common core principles. First, disciplinary literacy carries the concept of *learning on the diagonal*, combining thinking habits along with building sets of content knowledge (McConachie & Petrosky, 2010). Second, it creates authentic learning opportunities that allow students to interact with the disciplines in real-world contexts (Draper & Broomhead, 2010), with teachers and students in the roles of mentor and apprentice. Third, the authenticity of the educational experiences along with the roles of teachers and learners lead to a strong culture
and high expectations for learning in the classroom (McConachie & Petrosky, 2010), positively impacting student motivation and engagement (Buehl, 2011). Finally, as instruction and continuous formative assessment inform and drive each other (McConachie & Petrosky, 2010), students engage in learning experiences that match their unique learning needs.

The critical deconstruction of the disciplines, and apprenticeship within them, is a powerful tool for transdisciplinary learning. Being able to navigate within different discourse communities provides students the opportunity to successfully operate within them.

At first glance, it may seem that an emphasis on disciplinary literacy would work counter to transdisciplinarity. However, since a transdisciplinary approach requires one to engage in inquiry to explore and solve real-world problems through selecting tools from a range of disciplines (Leavy, 2011), proficiency in the language and processes of multiple disciplines is imperative. In Chapter 4, I will provide examples of student projects that illustrate the importance of the co-existence of disciplinary and transdisciplinary approaches to learning.

**Challenges in the application of (trans)disciplinary literacy.**

The bulk of federal monies continue to be directed to early literacy initiatives (Jacobs, 2008), and a wider range of useful reading interventions and assessments have been developed and continue to be administered chiefly in the elementary grades. Parental involvement in schooling dwindles significantly as students reach middle and high school, leaving adolescents at a disadvantage when they require even more assistance and support at home (Shanahan & Shanahan, 2008). Students in ethnic and racial minority groups and from low socioeconomic backgrounds tend to have even less parental involvement in their schooling, (Rothstein, 2004), widening the adolescent racial achievement gap even further in terms of literacy growth. Due to
the pressures of high-stakes testing, many teachers race to cover volumes of surface-level knowledge instead of engaging in deep, meaningful teaching of select concepts (Darling-Hammond, 2010).

Perhaps the most significant challenge in the implementation of disciplinary literacy lies in the preparation of middle and high school teachers. Elementary school teachers require coursework in reading instruction as they generally teach a range of subjects to the same group of children during the school day, while teachers at the secondary level specialize in the content of a discipline and rarely are required to learn about instruction in literacy within their discipline as part of their teacher preparation programs (Shanahan & Shanahan, 2008). Thus, teachers are so entrenched in the disciplinary nature of education that they do not even realize that they are contributing to the opportunity gap (T. Perry et al., 2004), resulting in a mismatch between instruction and student needs. This lack of awareness has led to misconceptions about literacy for content-area teachers as a change in their role from a teacher of a subject to a teacher of reading, without realizing the nature of disciplinary literacy as it applies to their content-area (Buehl, 2011). As a result of a lack of awareness and training in literacy instruction, there has been widespread resistance among middle and high school academic content-area teachers in embracing and implementing disciplinary literacy in their daily teaching (Jacobs, 2008; Moje, 2008). An additional complex factor for teachers at the secondary level is in the structure of the high school day, with short class periods and limited time to instruct students in both the content and its literacy demands (Moje, 2008). These complex challenges in the implementation of disciplinary literacy in the middle and high school levels must be addressed to make progress with adolescent literacy learning while providing the space for transdisciplinary learning to occur.
Next, I will discuss three approaches to transdisciplinary learning: problem-based, project-based, and service-learning. These three vehicles for curriculum design can support teachers and schools in making the shift toward transdisciplinary learning.

**Problem-based learning.**

Problem-based learning is a student-centered approach that organizes learning around investigation of a complex problem (Jarrett & Stenhouse, 2011). Though this approach to learning can take many forms, there are some general characteristics that are strong elements of this learning model: it begins with a real-world topic or problem; it is driven by student questions on the topic; teachers organize the curriculum around student inquiry, drawing from a range of disciplines; teachers take on the role of facilitator and guide; and finally, students utilize metacognitive skills and consider multiple perspectives to investigate and solve the problem (Drake & Burns, 2004; Strobel & van Barneveld, 2009).

In Stroebel & van Barnevald’s (2009) meta-synthesis of meta-analyses of problem-based learning and traditional classrooms, they found that the problem-based approach is more effective in terms of long-term growth in skill development and is preferred by teachers and students, while a more traditional instructional model is effective for short-term tasks such as performance on standardized tests. Furthermore, Drake & Burns (2004) assert that problem-based learning has a positive impact on student motivation and engagement, student behavior and attendance, and their ability to make connections across the disciplines and in authentic contexts. The authors explain that this contributes to growth in higher-order and critical thinking skills, creativity and collaboration, and instills a sense of citizenship in learners.
**Project-based learning.**

Project-based learning is closely associated with problem-based learning. The main difference is that project-based learning emphasizes the action associated with the creation of products within a project, which problem-based learning can be more theoretical in nature.

Dewey asserts that experiential learning contributes to growth in learners; however, he explains that not all experiences are equally impactful and that their success rests on the design and components of the learning (as cited in Tinkler, Gerstl-Pepin, & Mugisha, 2014). One of the most widely used frameworks for quality project-based learning design is the Buck Institute’s Gold Standard PBL Essential Project Design Elements and is comprised of the following: challenging problem or question, sustained inquiry, public product, authenticity, critique and revision, student voice and choice, and reflection. In the center of the Gold Standard wheel are the key knowledge, understandings, and success skills (Larmer, Mergendoller, & Boss, 2015).

In this approach, students learn skills and content through extended projects in which they explore a problem or question and investigate possible solutions. Project-based learning can occur in one classroom or content-area as well as across disciplines.

**Service-learning.**

Service-learning (SL) takes PBL a step further by integrating action as a central element of the inquiry process (Jarrett & Stenhouse, 2011). SL combines the goals of academic learning and community service (Celio, Durlak, & Dymnicki, 2011; A. Taylor, 2014). Though service-learning is common in K-12 as well as postsecondary settings, adolescence is regarded developmentally as an especially vital time to utilize the approach since these learners are just
beginning to make sense of their own voice and position within and beyond their communities (Goethem, Hoof, Orobio de Castro, Van Aken, & Hart, 2014).

In terms of student learning, the aim of service-learning is to develop skills beyond pure academics such as in the socioemotional, personal, and civic aspects of the learner (Conway, Amel, & Gerwien, 2009; Goethem et al., 2014; Kinloch, Nemeth, & Patterson, 2015). It creates a social and meaningful context for learning along with the groundwork for instruction in social justice (Conway et al., 2009; A. Taylor, 2014). Teachers benefit from being co-collaborators as it provides opportunities for cultural awareness in their students’ local community, shifting their mindsets about their teaching toward more culturally responsive curriculum and instruction (Tinkler et al., 2014). Simultaneously, as the SL framework helps learners think critically about the world around them (Drake & Burns, 2004), the model sets out to benefit the community as new learnings are co-constructed and actions are made to ameliorate local problems (Kinloch et al., 2015; Winans-Solis, 2014). Essentially, the ideal SL partnership is a continuous, collaborative process in which the students, teachers, and the community learn and grow together to form a shared identity (Chang, 2015), leading to individual and collective agency for social change (Chang, 2015; Jarrett & Stenhouse, 2011).

Theoretical underpinnings and approaches to SL.

Transdisciplinarity, along with its more applied forms of problem-based and service-learning, has roots in a range of theoretical orientations with contributions from a multitude of theorists. As a result, a range of approaches to service-learning have emerged.

Social learning and experiential learning theories are at the core of service-learning as they contextualize learning in the social aspects of community (Conway et al., 2009; A. Taylor,
From this constructivist viewpoint, influential theorists such as Dewey (1910) and Vygotsky (1978) assert that true learning can occur only through social interactions and experiences in meaningful, authentic contexts (Jarrett & Stenhouse, 2011; Tinkler et al., 2014). Furthermore, Dewey theorizes that hands-on learning in project-based settings fosters curiosity and knowledge production, leading to higher levels of reflective thinking and action as citizens (Jarrett & Stenhouse, 2011).

Service-learning also carries dimensions of socio-cultural and socio-historic elements. As students, teachers, and the community collaborate and generate knowledge, space is created for new understandings and connections to cultural, historical, and socioeconomic aspects of society (Kinloch et al., 2015; A. Taylor, 2014; Winans-Solis, 2014). It is considered a postmodern orientation as participants explore the complex, interconnected world and create multiple meanings (Winans-Solis, 2014).

Paolo Freire’s work in the area of critical theories contribute to this liberatory view of service-learning in which participants engage in critical reflection about inequities of power and knowledge in society, working collaboratively to foster agency, disrupt systems of oppression, and partake in counter-hegemonic actions for justice (Kinloch et al., 2015; E. W. Taylor, 2009; Tinkler et al., 2014; Winans-Solis, 2014). The field of New Literacy Studies also informs service-learning theories as it views literacy as an ongoing meaning-making process that can take on a multiplicity of forms, requiring learners to critically reflect on and make meaning from multiple perspectives in multimodal texts (Chang, 2015).

Reimagining the high school experience for deeper learning calls for a redefinition of the role of teachers in public education along with the professional learning needed for this
transformation to occur. This includes an unpacking and understanding of Discourses and disciplinary literacy as they relate to transdisciplinary learning. The curriculum design approaches of problem-based learning, project-based learning, and service learning can serve as frameworks for schools to guide their work. Across the United States, there are many examples of innovative schools that provide deep and meaningful learning experiences for students (Bellanca, 2015; Dintersmith, 2018; Mehta & Fine, 2019); however, there is a need for legislation to support this work and tackle systemic inequities on a broader scale. In this next section, I will discuss some examples of countries that have implemented such legislation on a national level.

**A Shift Toward Innovation: Lessons from Abroad.**

As Darling-Hammond (2010) explains, nations such as Singapore, South Korea, and Finland are successful in preparing students for postsecondary endeavors and closing the opportunity gap due to universal social policies and more specifically, through revising systems and structures in education to provide equitable access. In contrast with the unequal distribution of school resources, focus on high-stakes testing, and lack of quality and consistency in teacher education in the United States, these successful nations provide equal access to quality education for all students, use authentic assessment measures, and focus substantial resources and importance on teacher preparation and ongoing professional development. In this section, I will discuss the examples of Singapore and Finland: two countries from which we can learn about ways to implement stronger educational programs.

Singapore’s educational system has brought about high academic achievement in students, with PISA scores at #1 in the world in 2015 ("It has the world's best schools, but
Singapore wants better," August 30 2018). Despite their success in helping students prepare for standardized tests, Singapore is making significant shifts in its educational system. In 2018, the Ministry of Education (MOE) announced its ‘Learn for Life’ initiative with the goal of providing students with a more well-rounded education. Some major reforms include reducing the number of high-stakes assessments, providing teachers with more professional development and planning time around student centered-learning, and abolishing detailed student rankings (Singapore Ministry of Education, 2018). Also, there is more emphasis on “21st Century Competencies” and providing students with more real-world, workplace-focused applications of learning ("It has the world's best schools, but Singapore wants better," August 30 2018). The Minister of Education, Ng Chee Meng, is urging schools to provide students with more unstructured time for exploration and innovation to foster motivation and lifelong learning (Koh, December 29 2017).

Legislation. Put simply by Heng Swee Keat, the finance minister of Singapore from 2011-2015: “It’s not just about teaching how to be smart, but how to be a better human being” ("It has the world's best schools, but Singapore wants better," August 30 2018).

Like Singapore, Finland puts great emphasis on recruiting and training high-quality educators and provides ample time and access to professional learning opportunities and curriculum development (Finnish National Agency for Education, 2017). Finland is another example of a nation that has enjoyed high student achievement in high-stakes testing but is nevertheless making shifts to provide students with a more authentic learning experience. There are five main projects connected with Finnish education reform: first, there is a focus on integrating more digital learning tools into schools as well as a push for more active, student centered learning. There is also a renewed focus on improved quality and access to Vocational Education and Training Programs (VET) to prepare students for the workplace, tertiary
education programs, and art and culture to stimulate student creativity. Finally, there is a push for more collaboration between higher education and corporations to achieve a stronger relationship between research, education, and business innovation (Finnish Ministry of Education and Culture, 2016). Of these five core areas, the VET reform and curriculum reform are the most relevant to this discussion about Career and Technical Education in the United States.

VET in Finland is regarded as a high-quality educational pathway by 90% of the population and is popular, with 50% of students applying to VET programs that are focused on competency- and work-based learning (Finnish National Agency for Education, 2018). More recently with the Finnish education reform, VET programs have been reduced in number and grouped in more broad-based categories, providing students with a wider range of employment opportunities upon graduation. The structures and funding that support VET programming have also been streamlined and made more efficient (Center on International Education Benchmarking, 2018; Finnish National Agency for Education, 2018).

In terms of curriculum reform, Finland is putting more emphasis on student-centered, project-based learning and creating a more joyful experience for students in the new core curriculum. Assessment is shifted from a focus on standardization and high-stakes testing to assessment as a way to improve learning experiences, especially through student self-reflection. Another area of emphasis is on school culture, and specifically in ensuring access to high quality, personalized education for all students. Students are taught to embrace differences, collaborate with diverse learners, and participate in establishing a safe learning environment for all. Another important area of emphasis in Finnish education reform is on promoting the integration of content across disciplines and teacher collaboration across those content areas. Every year, it is mandated for students to engage in at least one multidisciplinary learning module, providing
them with the opportunity to experience learning in a meaningful, connected way (Finnish National Board of Education, 2016).

In comparison to Finland and Singapore, Perkins legislation in the United States promotes many similar ideals such as integration across the disciplines, access to high-quality education for all, competency- and work-based learning, and a desire to provide students with a range of opportunities to enjoy successful futures. Perhaps the United States could use these lessons learned from Finland and Singapore to take the next step and provide more effective guidance and supports in implementing these ideals in secondary CTE settings.

Schools across the United States continue to develop their portraits of successful graduates and the literature reinforces the importance of meta-skills as our technology-driven society continues to accelerate at a rapid pace. Career and Technical Education policy calls for academic and technical integration, but continues to be entrenched in the social, historical, and political forces that have resulted in tracking, standardization, inequities parallel to broader educational policy in the United States. The literature asserts that the creation of deeper learning experiences is essential to the reimagining of schools in the United States. Transdisciplinary learning, through a range of possible frameworks and approaches, is a way for teachers and schools to work toward deeper learning. There are a range of innovative schools throughout the United States that hold examples of deep and meaningful learning as well as national examples from abroad.

In this next chapter, we will journey into my research site, a school that has prioritized efforts toward deeper learning for student agency. I will share my research design, information about the school, the participants, and the data collection and analysis process.
CHAPTER 3: METHODS

3.1 Overview

Before conducting research, it is imperative to first examine one’s own philosophical worldviews to determine underlying beliefs (Creswell, 2014). I carry a hybrid of pragmatist, constructivist, and transformative views. I am a pragmatist in the sense that I am drawn toward problem-based, real-world application of research. At the same time, I am also a constructivist: I believe that knowledge is built through the multiple meanings and truths that exist in any understandings that arise from research, always varying within social and historical contexts. At my core, my desire is to be a transformative researcher so that I can contribute to attempts for social justice through collaboration with marginalized populations. Thus, for my dissertation, I allow the interpretivist and critical paradigms to guide me in my work with the goals of creating understandings and emancipation (Glesne, 2011). At the same time, my pragmatist and constructivist lenses live within this paradigm as I strive to co-construct knowledge with my participants and focus on the problems that we collectively deem to matter the most.

In this chapter, I will briefly discuss previous work that informed my methodology for this study, and specifically a pilot study that I conducted in 2015. Next, I will review my guiding research questions and provide a brief overview of my research design.

3.2 Previous Work Informing Methodology

In 2015, I conducted a pilot study in the context of a summer program grounded in a service-learning model for incoming ninth-graders at a technical high school titled “Agency in
Transdisciplinary Contexts.” One aim of this project was to explore patterns and meanings of, and elements of a transdisciplinary learning approach that contribute to, development of agency in teacher and student participants. Another purpose for the project was for me to engage in new learning and understandings about the research process to contribute to future studies, including this dissertation.

Since I had a built-in research site in the summer program at my school, and the program was grounded in a transdisciplinary approach to learning, I decided to explore the concept of agency as it existed in this transdisciplinary context. I also wanted to take advantage of the opportunity to delve more deeply into the concept of transdisciplinarity, with the goals of determining its practical applications and the exploring the literature bases in its applied versions.

This summer program took place every year in July for three weeks and was intended as a way to help incoming ninth-graders transition to this technical high school in an urban school district. It has been a grant-funded program for many years, but this particular summer it was funded solely by the school. All incoming ninth-graders were invited to join the program but more aggressive recruitment was targeted toward students who were slated to be in Special Education, English Language Education, and/or Title I Reading and Math. The purpose for this more targeted recruitment was to provide extra assistance to students who might need it the most.

Approximately 90 students from urban, diverse backgrounds participated in the program the summer of 2015. These students were assigned to one of four classrooms taught by teams of three teachers: one language arts specialist specializing in either English Language Arts, Reading, English Language Education, and/or Special Education; one math or science; and one
technical area teacher. Additional staff included a parent liaison, who focused on making connections with families before and throughout the duration of the program, and a paraprofessional who assisted with a range of tasks. Student leaders, who were tenth-twelfth grade students at the school, volunteered their time to assist in the program as mentors and classroom assistants. Two co-coordinators, including myself, were responsible for providing the vision, planning, and facilitating the program-level elements. An area of emphasis for us was to provide professional development and to spend much of our time in classrooms to coach teachers.

Before the start of the program, we planned and facilitated professional development for teachers and student leaders. The student leaders participated in activities focused on building leadership skills, the service-learning model, and planning community activities during after-school and two full-day sessions in June. The teachers participated in one full-day session to explore the service-learning model and begin planning curriculum in their teaching teams and alongside their student leaders. Through my observations, I noticed interpersonal conflict within teaching teams and varying levels of understanding of the service-learning approach, but there were no available funds to provide further professional development for teachers before the start of the program.

Each summer, there was a theme centered on a real-world problem that guided the work and projects. The theme of the program that year was Access to Education. During the regular program hours from Monday-Friday, 8:30am-12:30pm, teachers guided students through the service-learning process to investigate the problem, generate questions, refine the problem to a specific area of focus, and develop a public awareness campaign to promote change. During this process, we also introduced the students to two community partners: the local food bank and a
domestic violence organization. We provided the students with the option to participate in afternoon service-action activities with these two partners. In addition to working on their main project in class during the day, students guided the planning of the afternoon service action activities through the lens of the theme of Access to Education. They focused on healthy eating through the food bank and providing children living at the domestic violence shelter with fun, educational activities. Some of those activities included reading aloud to children as well as interactive, outdoor structured games that allowed the children to develop skills in collaboration and communication.

A significant piece of instructional time on Fridays was dedicated to career and technical education awareness activities. Reflection was also an important element of the program, as students wrote daily reflections in their notebooks and the students participating in afternoon service-actions took part in a reflective group discussion at the end of each activity. On the last day of the program, families and community members were invited to view the students’ public awareness campaign presentations.

I utilized a range of qualitative research methods throughout the course of this study, including pre- and post-surveys, participant observation, and semi-structured interviews with students, student leaders, and teachers. During this process, I noticed the power of photographs and videos in telling a story and giving voice to different perspectives and was intrigued to explore Photovoice, an approach to research that I will describe later in this chapter.

I also found that including the voices of different stakeholders gave rich perspectives on the research question. For this current research project, I hoped to include teachers as well.
However, too many ethical issues would be involved in simultaneously observing teachers through a research lens and through an evaluative lens as their supervisor.

3.3 Guiding Research Questions

Building upon the work I conducted in the 2015 pilot study, I used the following questions to guide me in this current research project:

In what ways is student agency co-created in a transdisciplinary CTE innovation program?

How do institutional systems and structures support or hinder the development of student agency?

3.4 Design

I used a community-based participatory research (CBPR) approach to examine patterns of student agency within this transdisciplinary, secondary CTE innovation program.

Participatory action research aims to generate new knowledge through the active participation of both the researcher and participants in the research process (Glesne, 2011). As Leavy (2017) states, CBPR is an orientation to research rather than a specific set of tools and is centered around addressing a problem through a social justice lens. Participatory action research helps to maintain a strong critical lens by providing voice to a population that is marginalized in multiple ways. I will discuss the element of marginalized voices through CBPR in more detail later in this chapter.
3.5 Research Setting

The broader school community.

The research site is a regional technical high school serving approximately 1,600 students in Grades 9-12 from four surrounding cities and towns. As labeled by the State Department of Elementary and Secondary Education, approximately 80% of the student body is Hispanic and comes from a large urban, low-income community in the Northeastern region of the United States. The students are marginalized in the broader society in a variety of ways, including their age, race, language, socioeconomic status, and status as vocational-technical students. By actively involving the students in the research project, I hope to bring out their voices and fight against the dominant narrative that puts them in a deficit model.

The school was established in 1963 as a regional technical high school serving slightly under 1,500 students in Grades 9-12 from four surrounding cities and towns. According to the State’s Department of Elementary and Secondary Education (2017), approximately 80.6% of the student body is Hispanic, followed by 17.4% White, and 1% or less Asian, African American, and Multi-Race, not Hispanic. Other special populations to note are: First Language not English: 40.8%; Students with Disabilities: 20.4%; High Needs: 66.9%; and, Economically Disadvantaged: 52.1%. There is an equal number of male and female students in the school. There are approximately 201 staff, of which 87% are White and 10% Hispanic.

According to the school’s website, the students in the current school spend 50% of their time in traditional academic classes and 50% of their time in Career and Technical Education programs approved by the State Department of Elementary and Secondary Education. During the ninth-grade, students participate in Exploratories, or trial periods in different trade or technical
areas. Students then submit their top choices and based on specific selection criteria, are placed in a career area such as plumbing, cosmetology, or information technology.

The STEAM program at Riverside Regional Technical High School.

STEAM is an innovation program within the regional technical high school and is the focus of my research. To preserve anonymity and confidentiality, I will refer to the school as Riverside Regional Technical High School. The program is relatively new and entered its third year of operation in the Fall of 2019. Like the traditional career programs in the school, the STEAM program emphasizes hands-on learning. However, it differs greatly in its approach, integrating academic and technical disciplines through project-based learning. Students spend time in classroom and studio environments, within and outside of the building, developing technical, academic, and meta-skills such as problem-solving and creativity through inquiry. According to the STEAM program’s innovation plan (2017), the vision is that “the curriculum blends the mind of a scientist or technologist with that of an artist or designer, enabling students to explore the area where STEM, the Arts, and the future intersect.”

The STEAM program has innovation status, meaning that the State allows for “increased autonomy and flexibility in one or more of the following areas: curriculum, budget, school schedule, and calendar, staffing policies and procedures, professional development, and school district policies.” As stated in the school’s innovation plan, the aim was to launch the program for 50-80 ninth graders the first year, and add on a grade level each year after that with an anticipated full enrollment of 200-320 students after four years. There are three central ideas that ground the program’s philosophy: “students should be exposed to as many concepts and fields of study as possible; taking responsibility for one’s own learning; and putting ideas into practice.” Thus, the experience of the STEAM program student diverges significantly from that of the
traditional career and technical student, who is placed in a specific trade or technical track freshman year and alternates between the shop area and academics every week throughout the four years of high school.

In grades 9 and 10, students develop academic, technical, and employability skills by engaging in transdisciplinary projects. Transdisciplinary means that all the academic and technical disciplines, or content-areas, work together in a deeply integrated way to mirror the real world. Students explore a real-world problem and use their learning from their academic and technical areas to find solutions to it. At the end of every transdisciplinary project, students share their learning outside of the classroom through an Exhibition of Student Learning. Not only do the students create all the projects and entertainment for the Exhibition, but they also design, coordinate, and run the event themselves. Through their projects, students explore and develop skills in STEAM through various aspects of biotechnology and engineering. All students experience full academic coursework that is directly linked to the STEAM fields. Another unique aspect of the program is that all students will have the opportunity to take coursework in music and music technology. In Grade 11, students choose either biotechnology or engineering as their area of concentration, to fully develop their ability to work in teams to support their career goals in the STEAM fields. Students are supported, coached, and advised by their instructors, mentors from post-secondary institutions, innovators, and employers in the STEAM fields.

**Staffing.**

In the launch year of the program, there were nine core teachers working exclusively in the program. Since the biotechnology and engineering technical areas in the existing school were
to be eventually be absorbed by the STEAM program, there was one biotechnology teacher and one engineering teacher dedicated to the ninth grade. These teachers were already working in the existing school. There were two more existing biotechnology teachers and two engineering teachers slated to be phased into the program as new grade levels are added. These teachers were still included in the program meetings and planning process before they transitioned in. In addition to biotechnology and engineering, there were six more teachers hired with expertise in the following disciplines: mathematics, music, biology, English Language Arts, sound engineering, and history.

Now, in its third year, there are eleven teachers in total, although only five of the original twelve teachers remain. The teachers have varied backgrounds in the following critical areas:

- Comfort level with risk and change
- Flexibility in thinking and operating outside their discipline
- Agency as individuals and as educators
- Experience working in an integrated, innovative, project-based environment
- Disciplinary background, expertise, and style
- Pedagogical background, expertise, and style
- Experience as teachers
- Familiarity with the students’ backgrounds and communities
- Experience in career and technical education
- Familiarity with the local school context

The learning cycle: An overview.
• **Transdisciplinary Projects:** There are three transdisciplinary projects in each year of the 10th and 11th grade.

• **Exhibition of Student Learning:** the goal is for students to share their work with others outside of our classrooms and occurs at the end of every transdisciplinary project.

• **Intersessions:** Intersessions are periods of time between each transdisciplinary project, usually between one-two weeks, and are focused on the following:
  - Passion projects that students want to create to extend their learning
  - Support for students who need it in any of their academic or technical courses
  - Test-taking skills for MCAS

*The daily schedule.*

One of the many aspects of the program that is not traditional is that the learning needs determine the schedule rather than the schedule determining the learning. Students still spend the required amount of time in each content area, but the duration of each class session may vary. For example, a science lab working with live organisms may require that students work in the lab for a longer period one day and a shorter period the next. Also, as the students get closer to the Exhibition of Student Learning for each transdisciplinary project, there are much longer blocks of open project time. This varied schedule is also more consistent with what students will encounter on the job, as they will be doing different things each day and there will not be a predictable bell to signal the next block of work. The schedule is communicated to students through a weekly email.

*Assessment.*

STEAM is a fully competency and mastery-based program. What this means is that the focus is placed on assessing and giving feedback on *growth in specific academic and technical*
skills. Instead of completing assignments and moving on at the end of the project or marking period, students continue to work on the skills until they have reached mastery (80% or above). The skills are fully aligned with the State Frameworks for the technical and academic areas. Teachers are encouraged to go beyond the standards by exploring Frameworks outside of this State as well as creating their own standards and learning goals. The assessment cycle is as follows:

- Students participate in many different assignments and activities to work on each skill
- Students reflect on how they are doing with each skill by finding evidence in their work and explaining
- Teachers work with students to review their evidence and give detailed feedback to help the student work toward the next stage of proficiency.
- Students are assessed using the proficiency scale below. All this information is in LiFT, a learning platform that is tailored to project-based, competency-based programs.
- At the end of every trimester, a mailing is sent to the students’ homes with the LiFT report as well as a traditional numerical grade translation.

<table>
<thead>
<tr>
<th>The Riverside Tech STEAM Assessment and Grading Scale</th>
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<tbody>
<tr>
<td><strong>Emerging</strong></td>
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<tr>
<td><strong>Developing</strong></td>
</tr>
<tr>
<td><strong>Mastery</strong></td>
</tr>
<tr>
<td><strong>Exemplary</strong></td>
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</tbody>
</table>
Advisory.

Each STEAM student is paired with a STEAM Teacher Advisor. Though every effort is made to keep the advisor to stay with the same cohort of students for all four years, there has been a need to make changes from year to year as the program continues to develop. While all STEAM teachers are supporting every student, the Advisor has a unique role in that he/she:

- continuously keeps track of progress and coordinates supports and extensions whenever needed
- helps set goals for themselves and specific plans for reaching those goals
- teaches skills to be successful in college and in the workplace
- helps in developing college and career plans

Students have their Advisory period twice per week for approximately one hour each session.

Guiding principles.

During the summer before the program’s launch, the teacher team worked together to develop a portrait of a successful graduate as well as guiding principles to make the vision of the program visible and explicit. It was also an opportunity for the team to engage in professional learning through this design exercise. After many iterations, the team decided on the following:

We will...

- embrace the Core Values of the school- Growth Mindset, High Expectations, Supportive Environment, and Life Long Learning.
- meet the needs of all students while putting students at the center of learning.
• take responsible risks and embrace experimentation and innovation.
• apply content area/disciplinary thinking and knowledge as lenses through which students process and solve relevant, real-world problems.
• connect with the world beyond school.
• value all disciplines equally within our program.
• collaborate as designers of student learning.
• continuously review and respond to the teacher and student learning environment for improvement.
• consciously implement solutions to minimize the impact of institutional barriers on student learning.
• have genuine integration among disciplines to provide a connected, meaningful student learning experience.

Currently, the teacher team is working on refining these guiding principles to make them more concise. Nevertheless, these design principles continue to guide the team throughout the development of the program.

My roles.

Before the launch of the STEAM program in 2017, I was hired as an English Language Arts teacher in the program. However, due to a combination of the school administration’s urgent need for help in implementing the program as well as their desire to act on my recommendations that resulted from this project, they asked me to plan the summer teacher professional development. That fall, the school administration officially put me in the role of professional learning coordinator for the program, and the following year I became the coordinator for the program overall. This past summer, I entered yet another role as the
program administrator. Due to my supervisory role this year, I did not include the STEAM teachers as participants in the study as the ethical issues with being both a researcher and evaluator presented too great of a risk. Instead, I decided to focus solely on the student perspective.

In this study, I seek to understand the ways in which agency is co-created in this program. In addition, I investigate the ways in which institutional systems and structures act as barriers or supports in the creation of such agency. I rely on the voices of the students themselves, as the participants of this study, to help me explore these questions. Students are involved in the entirety of the data collection process, including the selection of artifacts for analysis as well as reflecting on the artifacts to construct meanings.

3.6 Participants

I decided to focus on recruiting students from the Grade 11 cohort as they have been with the program since its inception in 2017. They have helped to co-create the program and have had more time to develop agency and have more insights into the program than the Grade 10 students. Since there are only thirty-six students in the cohort, I planned to accept any students who chose to participate.

I met with the thirty-six Grade 11 students in the innovation program in small groups during their daily morning meeting time and Advisory block to explain the study and allow time for questions. I then provided Informed Consent forms to the students who express a verbal interest and collected any forms with parent signatures the following day up to two weeks after. My aim was to focus on recruiting students to create a cross section of the Grade 11 STEAM program student body, specifically considering gender, race, ethnicity, socioeconomic status, special population
designations (i.e., English Language Learners and Students with Disabilities), and past academic performance. Nine students indicated interest and returned the completed informed consent forms. Since only two boys volunteered, I utilized selective sampling to recruit two more boys, bringing the total number to eleven. By the end of the data collection process, three students dropped out, coincidentally bringing the group to an even number of four boys and four girls.

**Risks.**

Since the participants are students in the program that I oversee, I considered that they may feel pressured to participate. I have worked with them over the past two years and have developed relationships with them, therefore, I was aware that they might agree to participate to please me. Also, even though I am not their teacher and have no influence over the grades they receive in their classes, I knew that they could mistakenly make that assumption.

To minimize the risks, I continuously assessed the risks. I made sure to initially make clear with all students that their participation, or decision not to participate, would not affect their grades in their classes or their relationship with me. I also made sure that all teachers in the program received that message and reinforced it if students have questions about their grades connected to the research. Before I held my first informational meeting with students, I met individually with each STEAM teacher to discuss the study with them. I made clear that I did not intend to include them as research subjects and I shared my research design with them. I asked if they had any questions and asked for them to come to me at any time if they had any questions about the study. After speaking with all the teachers, I changed the times for the student focus groups/interviews from after-school to during the Advisory block as they suggested it would be less disruptive to the extra-help sessions that teachers hold after school.

I wrote memos to examine my biases, my role as participant-observer, and the potential risks
to my participants. Also, as part of the CBPR approach, I met with the participants frequently to reflect on our experiences. This consisted of checking in about the status of the data collection as well as to troubleshoot any challenges that arose. In addition, I reminded the participants at the beginning of each meeting that they had the option to opt-out of the project, without any negative repercussions.

3.7 Data Collection Methods

I utilized Photovoice and semi-structured interviews as the main methods for data collection in this study. My data consists of individual interviews and focus groups; photographs, videos, and any other artifacts that the participants selected; and my own observations of students during their normal activities at school (audio, video, and/or observational notes).

Photovoice.

Photovoice is a CBPR approach that gives voice to marginalized populations by providing them with cameras to collect data to gain insights into their world and propel social change (Goodhart et al., 2006). I was first inspired by Luttrell’s (2010) photovoice project with elementary school students to provide students with voice, agency, and power in sharing their literacy experiences in the classroom. In my research, I asked students to use photographs to illustrate the elements in their environment that foster or impede the development of their own sense of agency. I began the process in October by holding group sessions with students to explore the concept of agency and data collection methods. I provided students with the following description on the informed consent form:

IR: Throughout our day, we have lots of different experiences that make us feel proud, successful, and capable of anything, and others that do not. It will be your job to show these
experiences, good and bad, through taking pictures and bringing me anything else from your daily life. Some examples of what you can bring would be projects or writing, but be creative, you know best!

The Process.

The participants engaged in the data collection process in a variety of ways over the course of eight weeks, from mid-October to mid-December 2019. There were four focus group sessions over the course of eight weeks, multiple brief informal check-ins, researcher observations, and semi-structured interviews. While the meetings were productive and successful overall, there was one main obstacle that arose continuously: limited time. This did interfere with the pace of the work and the amount of time per meeting, but I did my best to adjust as we went.

Focus group session #1.

Session #1 took place during an Advisory period and began with a whole group discussion on the purpose of the study, our roles, and best practices for content gathering and subject consent in taking photographs. After working a bit with the group, I realized it was premature to delve immediately into the complex concept of agency and decided to scaffold the understandings with other language: power and voice vs being marginalized and oppressed. I intended to introduce the concept of agency and my research questions to them later, but eventually decided against it as the power and voice concepts resonated with them and generated data around student agency in a more organic way. Over the course of the next few weeks, the students informally and organically refined the language to empowerment and disempowerment.
After the whole group discussion, I guided the students through an activity with the purpose of co-constructing a group definition of agency and as a light entry into the data collection process. As a whole group, we briefly discussed power and voice vs being marginalized as a whole group to get to a baseline common understanding. Then, I split the students into two groups and asked them to think about examples of when they feel they have power and voice and examples of when their power and voice is taken away. Some students worked individually while others worked collaboratively. They wrote down one concept per sticky note and posted them on the corresponding piece of chart paper (See Figure 1).

*Figure 1. Focus group activity on power and voice in students' lives. Photograph by Panagiota.*

We ended with a full-group conversation about the students’ noticings from the brainstorm on and a debrief on the activity. The general sentiment was that they enjoyed the activity because they were able to co-construct their own understandings, physically move...
around the room and have the flexibility to work independently or with others. I left them with the assignment to begin taking pictures, with an emphasis on gathering and storing the data rather than selecting which artifacts to share with the group. The depth of the students’ brainstorm and discussion was more than I expected for our first session. The existing relationship and familiarity among the students and me could be a contributing factor for this successful initial meeting.

Focus group session #2.

The content of the second focus group session was not as exciting as the first and a bit disjointed, but nevertheless was productive during an abbreviated Advisory period. We discussed options for data storage and organization and decided on a shared Google folder system for the sake of simplicity. After having some time to experiment with taking pictures, students had clarifying questions about what ‘counts’ as data for this project. The students brought interesting viewpoints to the topic, such as wondering whether photographs taken in the past could be used, if a photo collage or video would be acceptable, and if reflections on the data could be written in the form of a poem. We also explored different techniques and technologies that could be used for recording reflections such as voice-to-text applications. I introduced the concept of memoing as a helpful part of the research process, but eventually ended up abandoning it as students were struggling to balance collecting artifacts and reflecting on the data with their school and home responsibilities. As our conversation naturally ended, the students spent a few minutes chatting about most eventful moments of the homecoming dance that they recently attended.
Focus group session #3.

After some informal check-ins with the students, both individually and as a group, a pattern of challenges emerged with taking photographs. Therefore, the focus of most of the third meeting was on that topic. I facilitated the discussion by asking students to share any challenges and followed up with open-ended questions to the group to encourage students to offer solutions to the problems that were raised. For example, one student shared that she was struggling with certain teachers not allowing her to use her phone, which she was using as a camera, in class. As a group, we discussed strategies for communicating with the teachers to explore the potential of a middle ground. Another hot topic was forgetting to take pictures between sessions. We spent some time discussing the various responsibilities that students were balancing and thought about strategies and tools that help with organization, especially those with a lot on their plates. Solutions that came from the discussion included daily recurring reminders on their cell phones as well as an accountability partner system. This meeting was cut short as students needed to break away to work with teachers for extra help and/or committee work as we met during their Advisory period.

Informal check-ins.

I conducted weekly/biweekly group check-ins with the participants to share their experiences with data collection, both successes and challenges, and troubleshoot next steps together. We typically met during morning meeting, at the beginning of the school day, for about ten minutes. We also corresponded over email.
**Focus group session #4.**

Our final focus group meeting was a three-hour session on a Saturday morning to review their artifacts and discuss their thinking. I asked students to choose photographs and artifacts that they feel are particularly important to share and reflect upon and save in their Google folder. There was a total of sixty-two pictures that were selected for reflection by the group, eleven of which I added myself. I printed the pictures and enlisted the assistance of two of the students to plan and lead the session. They led the group debrief with all the participants and asked them to share their experiences, reflections on their experiences, and explore common themes. Then, students gathered at least one photograph to reflect on individually. They had the option of either writing, audio recording, or video recording their reflections.

**Observations.**

I also observed the students regularly during their normal school day as part of my job. These observations and interactions occurred organically and informed my reflections on student agency, my conversations with the students around agency and similar topics and added other dimensions to the concepts that were emerging from the data.

There were three instances in which I gathered data through observation in a more deliberate manner for the purposes of this study. I gathered the data through video and audio recordings as well as photographs. There were times in which I directly interacted with the students and others in which I simply observed. I selected these moments as I anticipated that they would be informative for this study and happened to be available during those times.

One instance was when a group of students, some of whom were participants in this study, were invited to a teacher curriculum work session. The teachers were stuck in the process
of constructing the transdisciplinary question for the second trimester and wanted the students’ input to help them discover and finalize a strong question.

The second was during the kickoff activity for the second trimester project that was driven by the transdisciplinary question: *How can we thrive in this changing world?* In addition to getting students excited about the project, the aim of the kickoff activity was for students to gain confidence about being creative in this project and in the STEAM program. As this was a station-rotation activity with the students divided into groups, I observed the groups that had the highest concentration of the study participants. At the end of the activity, the teachers needed one more person to facilitate a small group reflection and asked me to join. I recorded the conversation, transcribed it, and added it to my files for analysis.

The third moment was a day-long visit from a group of educators that were being hosted by a university in Boston as part of a conference on innovative education. The educators were from a few countries in South America and consisted of officials from a ministry of education and school leaders who are developing innovative educational programs. A group of our students, some of whom were participants in this study, were active participants in leading the visit, including a tour and discussions with the visitors.

*Individual semi-structured interviews.*

The following week, I met with each student individually to delve deeper into their experiences of empowerment and disempowerment both in and out of school. I generated my interview questions after a review of the video recording of the final focus group session, their photographs and their reflections (See Appendix B). My questions were mostly sparked from patterns that I saw initially emerging, ideas and experiences that I thought were important to learn.
more about, as well as other more sensitive topics that I considered to be better to address in a more private setting. These interviews lasted from twenty minutes to forty-five minutes. After interviewing all eight students, I met briefly again with three of the students for some follow-up questions based on topics that emerged across the conversations.

*Roles.*

The students took the lead in the data collection process by deciding what to collect, when to collect, and what to select for reflection. They decided on the best method for data storage and managed that data themselves. I served as a guide and support in terms of purpose, procedures, encouragement, and troubleshooting challenges. The only data that I provided was from the three instances in which I deliberately observed and recorded; however, I did this to help them document moments that they were not able to document themselves because of their roles in the events. I also offered the photographs from those days as options from which to select for reflection rather than offering my own reflection. If I had more time available during the school day, I would have documented more than those three instances for the students.

In Photovoice studies, it is common for the researcher to be a full participant in the data collection process, including interpreting individual photographs (Latz, 2017). In this study, I feel that it would be inappropriate for me to make interpretations of the students’ photographs. They are the only experts on their experiences, and for me to make assumptions and attempt to explain their photographs would essentially be my own privilege and power encroaching on their space and voice. I distinguish this from the analysis of the students’ reflections and interpretations, which I consider to be appropriate for the researcher in this study. I
view the data analysis as a way to extract the most powerful and salient patterns from their own processing of their experiences and take their voices to wider audiences outside of their reach.

3.8 Data Analysis

I utilized critical grounded theory as the main method for data analysis in this study. In this section, I will begin with a brief overview of critical grounded theory and my reasoning behind selecting it. Then, I will discuss the data analysis process, including challenges that I faced along the way.

Critical Grounded Theory.

Grounded theory uses a generative approach to developing a theory (Amir, 2005). Though there are variations of this method, from Strauss & Corbin’s (2007) highly structured, positivist version compared to Charmaz’s constructivist form (Creswell, 2006), it is characterized by an inductive process of increasingly specific coding through field notes and memos with the ultimate purpose of discovering a theory (Montgomery & Bailey, 2007). Positivism is a midcentury epistemological view that places value on quantitative evidence to explain phenomena in the world as well as an emphasis on creating unbiased knowledge through a clear, rigid separation of researcher and participants, and considers other ways of knowing to be invalid (Charmaz, 2014). Charmaz (2014) considers positivism to be “narrowly scientific” as it disregards data generated through other ways of knowing and that “their beliefs in scientific logic, a unitary method, objectivity, and truth legitimiz[ed] reducing qualities of human experience to quantifiable variables” (p. 6). Thus, the difference is stark between positivist and constructivist epistemologies, as the constructivist places value on joint meaning-making of researchers and participants, accepts qualitative data as useful and valid, and challenges researchers to bring
forward and examine their own biases rather than put them aside under the guise of being bias-free. Hence & Skewes McFerran (2016) assert that although grounded theory and participatory approaches seem to be opposing paradigms, a critical grounded theory approach anchored in Charmaz’s (2014) constructivist view can work well together. Strauss & Corbin’s approach is grounded in a positivist view on research and can be highly structured and prescriptive in its overemphasis on adhering to specific technical procedures to ensure validity of the findings. Charmaz’s (2014) critical grounded theory method allows for more flexibility in the procedures while ensuring that the theories that emerge are grounded in the context of the study, allowing for the nuances of the participants’ voices and experiences to remain on the surface.

I chose grounded theory as my data analysis method because I consider it to be a useful way to take themes and findings from the data one step further to the level of generating theory. This provides the opportunity to look at my research problem in a holistic, comprehensive way. My desire to generate research that could be helpful to policymakers and practitioners and to contribute to the CTE research base are the main elements that propelled me to enter this doctoral program. Hence the grounded theory approach appears to be a strong fit with my purpose as it can help me in hopefully creating something that can be helpful to others in a concrete way. Since my research problem is an area that lacks theoretical models, a theory connecting the concept of academic and technical integration with student agency could be a strong contribution to the literature in CTE. As it is a way for “discovery of the underlying social process” (Montgomery & Bailey, 2007), it would be fitting to use this approach for my purposes in education since its foundation sits on social processes.
The Process.

Though the data analysis process occurred alongside the duration of the data collection process in the form of memos, the structured grounded theory analysis began after the final semi-structured interviews in mid-December 2019 and continued through February 2020. Although I considered involving the students in some aspects of the data analysis, I ultimately decided against it due to the sensitive and private nature of some of the data that emerged from the individual interviews. Since the group is small and they were deeply involved in the data collection process together, I could not find a way to safely conceal the identity of individuals who shared the delicate information.

My first step was to transcribe the data from the focus group sessions, observations, and interviews. I used the online transcription tool Trint to automatically take the voice and audio files and turn them into text. Then, I went into each file in Trint, manually assigned names to the speakers in the text, and listened to the recordings to make corrections to the text itself. This process was more time-consuming than I expected, especially as there were many errors in the automatic transcriptions of the Spanish L1 participants. Still, the tool provided a useful base for the transcription and the features for playing back the audio/video while editing the text were user-friendly and helped me with my overall accuracy.

Next, I uploaded the transcripts from Trint to the CAQDAS program NVivo 12. I took Charmaz’s (2014) advice on first-cycle coding in grounded theory research and initially coded the data line-by-line, resulting in 509 initial codes. I used a mix of In Vivo and Process Coding methods as they are recommended as preferred coding methods for grounded theory research (Charmaz, 2014; Saldaña, 2016). Due to the quantity of initial codes, I found it difficult to scroll through the codes and visualize them grouped as larger concepts. I utilized Saldaña’s (2016)
recommendation to engage in post initial-coding transitions before jumping into second-cycle coding, and specifically tried the Tabletop categories method (p. 231). Using this method, I took the 509 initial codes from NVivo 12, converted them into a Microsoft Excel file, printed them onto paper, and cut them into individual strips. I put them on a large, flat surface, one-by-one, and grouped them into conceptual categories by hand. This helped me transition into focused coding. As Saldaña’s (2016) stated, it was much faster than doing it on the CAQDAS program, especially due to the unwieldy number of initial codes from the line-by-line process.

Though I quickly finished the Tabletop categories process, I ended up with 41 concepts from the 509 initial codes and grappled with different ways to consolidate those 41 concepts into a few larger themes. This was a grueling process that was riddled with self-doubt, worries about not representing the students’ powerful voices and messages well, and rounds and rounds of recategorizing the codes. Nevertheless, there were some big ideas that continued to emerge for me no matter how many ways I organized the smaller concepts. I consulted with Saldaña’s (2016) coding manual for ideas about next steps and decided to try “shop-talking” through the study (p. 231) with two family members and a colleague/friend from my doctoral cohort. Finally, I talked with one of my committee members, and he helped me to see the themes more clearly and with more confidence. In the following chapter, I present the themes with accompanying descriptions through the students’ voices.
CHAPTER 4: FINDINGS

4.1 Overview

In this study, attending closely to student perceptions and voice, I explored the ways in which students in an urban innovation program within a regional, secondary Career and Technical School experience and understand transdisciplinary learning. The following questions guided me through this research process:

In what ways is student agency co-created in a transdisciplinary CTE program?

How do institutional systems and structures support or hinder the development of student agency?

My purpose is threefold: to bring out the powerful voices of this marginalized population and share them on a broader level, to contribute to the literature base on secondary CTE, and encourage others to do the same.

I utilized Photovoice as an approach to engaging in the research process alongside the students and encouraging the understandings to emerge through their experience. Eight students participated in the entirety of the data collection process consisting of individual interviews and focus groups; photographs, videos, and any other artifacts that the participants selected; and my own observations of students during their normal activities at school (audio, video, and/or observational notes). I then relied on Charmaz’s (2016) constructivist grounded theory approach for my data analysis.

In this chapter, I will present each of my four findings in separate sections. Within each section, I will discuss the findings through the students’ lenses and voices in related sub-themes.
and categories. Throughout the findings, I weave their stories and sentiments together at times, and at other times I discuss them separately when I deem that it is important to clearly bring out and emphasize the struggles and hopes of the individual students. Whenever possible, I present the themes in their own words to preserve and respect their voices as well as to give the reader a sense of the students’ speech and language patterns. Although participant demographics are typically presented before the findings, I have folded them into my first finding as they are directly interconnected with it. See Table 1 below for a snapshot of the findings and major associated themes. I will end with a summary of Chapter 4 and transition into Chapter 5.
<table>
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<th>Findings #3</th>
<th>Findings #4:</th>
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<td>How We Learn: Connectedness and Integration</td>
<td>Our Mindset: Resilience and Positivity</td>
<td>Seeing Our Future: Clear Pathways to Impact and Success</td>
</tr>
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<td>Themes</td>
<td>Emotional and physical proximity of family systems</td>
<td>Connectedness</td>
<td>Coping with trauma</td>
<td>Visualizing a successful future</td>
</tr>
<tr>
<td></td>
<td>Perspectives on local community systems</td>
<td>Integration</td>
<td>Conquering challenges</td>
<td>Anticipating barriers</td>
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<td></td>
<td>Roles and responsibilities</td>
<td></td>
<td></td>
<td>Hopes and fears</td>
</tr>
</tbody>
</table>
4.2 Finding #1: Who We Are and What We Carry

*Who We Are and What We Carry* is the first finding that I will explain. When discussing empowerment and disempowerment in their lives, the students shared a pattern of experiences and reflections that tie directly to their childhood and lives outside of school. After a review of the student demographics (language of classifications included are directly from the State’s Department of Elementary and Secondary Education, I will share their stories of power and voice in their childhood and current family systems. The themes of *Emotional and Physical Proximity of Family Systems, Perspectives on Local Community Systems, and Roles and Responsibilities at home* emerged as being important factors in what they carry with them in their lives. Events and experiences with family, home, and community contexts impact their readiness for learning and their mindset about themselves and the world around them.

**Demographics**

All eight students are in Grade 11 in a STEAM program in a CTE high school and range in age from 15-18. There are four males and four females. Six of the eight students’ first languageis Spanish and two of the eight speak English as their first language. Three are designated as Limited English Proficient (LEP) and one as Formerly Limited English Proficient (FLEP). Four of the students were born in the United States, while three were born in the Dominican Republic and one in Guatemala. The students’ race/ethnicity are as follows: one Hispanic/Latino and African-American/Black, one White, and six Hispanic/Latino. Since the students describe themselves as Spanish or Hispanic rather than Latinx, I will use the same language when I refer to their race/ethnicity, apart from their official designations in the chart below. Five of the eight students are designated as Low Income/Economically Disadvantaged. Three have
Individualized Education Plans (IEPs) in place to support their instruction due to learning differences and one has a 504 Plan to allow for accommodations. See Table 2 for a summary of the student demographics. The participant names are pseudonyms that they self-selected for the purpose of anonymity and confidentiality.
<table>
<thead>
<tr>
<th>Name (pseudonym)</th>
<th>Age</th>
<th>Grade</th>
<th>Gender</th>
<th>Place of Birth</th>
<th>Race/ Ethnicity</th>
<th>First Language</th>
<th>Limited English Proficient</th>
<th>IEP/ 504 Plan</th>
<th>Low Income</th>
</tr>
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<tbody>
<tr>
<td>Nick</td>
<td>17</td>
<td>11</td>
<td>M</td>
<td>Dominican Republic</td>
<td>Hispanic/ Latino</td>
<td>Spanish</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Rose</td>
<td>16</td>
<td>11</td>
<td>F</td>
<td>United States</td>
<td>White</td>
<td>English</td>
<td>No</td>
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<td>11</td>
<td>M</td>
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<td>No</td>
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<td>F</td>
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<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
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<td>16</td>
<td>11</td>
<td>M</td>
<td>United States</td>
<td>Hispanic/ Latino</td>
<td>Spanish</td>
<td>Yes</td>
<td>IEP</td>
<td>Yes</td>
</tr>
<tr>
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<td>F</td>
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<td>Spanish</td>
<td>FLEP</td>
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<tr>
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<td>11</td>
<td>F</td>
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<td>Hispanic/Latino</td>
<td>Spanish</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Paul</td>
<td>16</td>
<td>11</td>
<td>M</td>
<td>United States</td>
<td>African-American/Black Hispanic/Latino</td>
<td>Spanish</td>
<td>No</td>
<td>IEP</td>
<td>No</td>
</tr>
</tbody>
</table>
Physical and Emotional Proximity of Family Systems

All eight participants described elements of *Physical and Emotional Proximity of Family Systems* as a key factor in their individual power and voice. Levels of home stability, quality of relationships with family members, reliability of support systems, and incidence of traumatic events impacted their feelings of power and voice. I will refrain from including visual artifacts that include images of the students in this first section of Finding #1 to provide an extra layer of anonymity for their protection. I have taken measures in other sections that contain photographs of students, either by covering their faces if it was impossible to link the image with a student pseudonym without revealing their identities or omitting their names in the captions.

**Defining emotional and physical proximity of family systems.** I use the word proximity to characterize the spectrum of connectedness and disconnectedness that occurs within family systems. This closeness and distance can occur emotionally, such as through displaying affection or animosity; and physically, through spending quality time together or abandoning the child. The closeness and distance also manifest in different ways. For example, a parent might be physically distant by geographic location but may be in close emotional proximity by talking to the child regularly, praising them for their accomplishments and offering advice during difficult situations. At the same time, the parent might be in close physical proximity by living under the same roof but distant emotional proximity by abusing the child.

**Instances of close, positive, and consistent proximity.** Two of the participants in this study have family systems that consistently maintain close, positive, physical and emotional proximity throughout their childhood and up to their current point in adolescence. They have always lived with both of their parents and siblings and shared that they feel loved, cared for,
supported, and deeply connected with and integrated into their family system. Both families have a middle-class status financially, and compared to their local communities, have an even higher status in terms of class.

**Paul.** Paul explains that his parents faced their own, unique challenges in their youth, chiefly around the areas of race and poverty. He depicts those challenges in a positive way, saying that “I know that they love me. They care for me. They want to do what's best for me. And with the different experiences, they have differing opinions on what's best for me.” He also “takes advantage” of all the support and opportunities that they provide him. He reflected fondly on his relationship and visit with his extended family in the Dominican Republic, describing it as “a fun time.”

**Ren.** Ren commented on some squabbles with his two siblings, but overall expressed that time with his family as a preferred out-of-school activity. “I usually hang out with my brother and some friends from the school here. And we just go to like…movies or someone's house just to hang out. And most of times I hang out with my family.” Neither of the participants reported any significant trauma in their lives.

**Instances of close, positive, and inconsistent proximity.** Two participants have family systems that currently maintain close, positive, physical, and emotional proximity with at least one adult in their family and may have had some transitions and inconsistency in their childhoods.

**Nick.** Nick spent his childhood living with his mother in the Dominican Republic. When he was in the fifth grade, his mother got married to his stepfather who “brought us here [the United States].” He did not volunteer any information about his birth father. Though he faced some challenges with the move to the United States, he views it in a positive way overall:
It was different. It was like something different that I never thought about it. You know, and there was- it was great. You know, experiences, as you learn a new English and new language and- yeah. So it's fine now. I like it.

His sense of family and connected system of support helped him to successfully deal with the transition to his new life in the United States. One of the strongest contributing factors was the way in which his stepfather integrated him into his life, and during our conversations, Nick spoke about his stepfather with respect and adoration. In summarizing his current family system, he mused that:

We're happy. All my family we’re like, so close. We love each other. And as like, every time we get together it's like oh, we're always been like this positive like, moment and stuff. We're always happy we go out together.

Nick feels the strength of the consistent emotional and physical proximity in his new family structure in the United States and is especially impacted by a solid father figure.

**Jack.** Jack lives with him mother, brother, stepfather, and stepsiblings. He views home as a positive environment filled with love, fun, and structure. His mother is an active participant in his education and a positive force in his life. He did not share any further information about his family.

**Instances of negative physical and emotional proximity.** The remaining four participants have consistently significant negative physical and emotional proximity in their lives. They have all faced traumatic life experiences that are especially significant in at least one of the following ways: intensity/severity; duration; and overall impact on themselves and other family members. Before I recount some of their stories, I find it important to clarify that these adolescents have not been completely abandoned and have had strong adults, including a parent
and/or an older sibling, supporting them in their lives as best they can. They shared bright spots in their memories of their families which I will interweave in this section.

**Becca.** Becca has had a tumultuous childhood that spurred a string of traumatic experiences in her life. In our fourth focus group meeting in which the students selected pictures to reflect upon and share with the group, she began with a picture of a man sitting on a couch and smiling: “…that's my dad. That's the last picture I took of my dad before he died a week after. So, yeah.” This was a difficult moment for her as she typically does not talk about her father’s death with anyone, but the rest of the group was supportive and respectful as she exposed a sensitive part of her life to them. She also selected a picture of a class activity that had the yin and yang symbol on it and used it to process through her feelings about loss and change:

Yin and Yang and the fact that good things are happening and bad things I'm trying to like, you know...they're, like fighting over- over, like even our own bodies like...you can think you're healthy, but you really sick and you don't even know about it. Yeah.

Becca’ refers to bodies and sickness as she processes the sudden death of her father. She tries to make sense of the lack of control that we have over our bodies when we are ill and pass away, and that constant internal battle to try take control in any way possible.

Becca moved away from what she described as a “rich city” in the Dominican Republic with her mother and brother to depressed areas in the United States. They moved between two states until they finally settled in their current location. Her older sister stayed behind in her home country. While financial instability plagued the participant’s family, her life became complicated further when her brother married a woman from the Dominican Republic who joined their household. This period was marked with conflict among all members of the household as they tried to integrate their lives with each other and set boundaries. Mom liked to
keep the home in a certain way and frequently clashed with the daughter-in-law. Meanwhile, her brother began to raise concerns about Becca’s new relationship with a boyfriend, resulting in a contentious and strained relationship. To solve the perceived problem of a negative influence in her life, Becca’s mother decided to send her to the Dominican Republic to live with Becca’s brother’s wife’s family. She felt uncomfortable living with “family” who were essentially strangers to her and kept to herself, spending most of her time in her bedroom alone. Her next traumatic experience began with her sister-in-law’s stepfather’s actions, accusations that she slept with him, and the way in which her mother handled it:

…she [mom] kept saying, like, I was the one I slept with her [daughter-in-law’s] stepfather. And my mom got to a point that I was I talked to my mom. I was like, that’s not happening. You know me. I’m not like that. But like, you know, it’s on you if you want to believe it, because I’m not going to, you know, argue about it if I know what I’m doing. Because this guy once got drunk and he came in my room and he went he left…I told her what happened. And she believed me but like, she didn’t believe me after…And that wasn’t the first time [he] tried. So like he was trying with someone else, too. The one of her cousins that was staying for a few weeks…

After that, Becca moved in with her older sister who provided her with a stable home and support. She now lives with her mother and her brother and his wife live in a separate home. She explained that her relationship with her brother continues to be hot and cold because of “what I did,” meaning what she was accused of doing with her sister-in-law’s stepfather. Nevertheless, she continues to make the effort to maintain contact with him.

**Doris.** Becca and Doris share the experience of the death of a parent and the ripple effects that come with this type of loss. Doris had a happy life in her home country of Guatemala that
she shared with her tight-knit family: her parents and four siblings. She selected a photograph of her village to share as a representation of the joy, belonging, and tranquility that she felt there (See Figure 2).

Figure 2. Hometown in Guatemala. Photograph by Doris.

Things changed when her mother became sick and died from cancer three years ago.

Doris described the physical and emotional schisms in her family that followed:

So my dad is in Guatemala…[and my] siblings. And my another brother, he is here with me. I'm living with him. He is twenty-two. It feels so- I'm don't know- I mean, really, we were a family where we always were together. When she died and passed away like my brothers and sisters- they took [it] like [in] their own way (inaud). Yeah. So it feels so bad.

She has a good relationship with her brother, but she does not see him much because he works a lot. In contrast with Nick’s experience, her new life is lacking the supports at home that
could help her in her transition to her new life in the United States. “New language, new people…it's a lot. It was like, oh, also a new schools, because I transfer…” Dad is still a warm presence in her life and he feels proud of her. They talk regularly and she shares her excitement about school and her accomplishments with him. At the same time, she yearns for the emotional proximity that she once had with her father: “he's not here with me. So he's not supporting me-like- let's say emotionally.”

In Doris’s case, the lack of physical proximity with her father, along with the emotions they both feel due to the loss of mom, resulted in emotional distance with her only living parent. Her brother’s emotional presence helps to partially fill that void of a lack of parental presence in her life.

**Rose.**

Rose’s parents are usually emotionally connected with her and are highly involved in her education. Her mother frequently contacts me and her teachers to check on her progress and problem-solve together about ways to support her. Both of her parents are caring and put Rose first. They are thrilled with her accomplishments in school and shower her with praise. In addition to the positives, Rose also shared her struggles at home, consisting of periods of less emotional and physical proximity:

It's me and my mom and my dad. I have no siblings. My, so my mom has like, can get really depressed sometimes. And [mental illness] that's like something that's been consistent with my entire family for all my life. I had to grow up quite a bit faster because of my mom, and my dad was always working so he wouldn't be there…And my dad now works two jobs instead of one. So I don't see him that often. But when we do see each
other, we may argue and stuff, but we still have a connection and I can still go to him and talk to him about stuff.

Though there are factors in Rose’s family that affect the consistency of her emotional proximity to her parents, overall, she has a solid and reliable support system at home.

**Veronica.** Veronica emigrated to the United States when she was five years old along with her three-year-old sister and father, creating a physical distance with her mother who stayed in the Dominican Republic. Her father now has ten children in total scattered in two states and is currently living with his youngest children and their mother. Veronica’s experiences with her father have been riddled with neglect and abuse. “My dad is- (sighs) oh my god. I really do not get along with my dad.” Her relationship with him was “never good” and they’ve “always have a like, a bad relationship since I was small.” Veronica sees similar relationship patterns between her father and younger siblings. She made attempts during her childhood to gain his attention and support, sharing her school accomplishments with him but never receiving the approval she sought. When she was eleven years old, her strained relationship with her father coupled with him constantly fighting with her stepmother because “he cheats a lot and stuff like that” made home life unbearable for Veronica. She ran away from home:

… then the day that he found me he [dad] went with the cops. And then they brought me back to his house like I didn't even last a day there...my dad started arguing with me because supposedly the TV was too high and it was at 8:00 and the TV was only at 10 [volume]. I remember the TV was at 10. And you know that's not high, that's literally so low. He said I wasn't letting anybody in the house sleep and stuff. And I was like, it's not even high it's low. You took out the internet, you've disconnected my phone and I don't have anything to do. And he started yelling at me. And then I remember it was- he started
fighting with me and then he hit me. And then I hit him back because like, I had to defend myself because he was hitting me, like if he was fighting a whole man [emphasis added], like it was crazy.

And then I went my sister and I was like telling her I wanna call Tia, my aunt, my sister's mom so she could like take me and stuff and my sister did not want to, she was like, no. And then I ran up to the neighbors and they were like oh I don't wanna get into problems with him because you know that my dad is the landlord. And then my stepmom called her sister and they bought me a whole flight they sent me to DR. And then in the airport, they saw me like, you know, and they were like oh what's going on, blah blah blah.

Veronica stayed in the Dominican Republic for four months due to her green card limit in the United States. She is currently in contact with her father when “like he'll text me to go take care of his kids and then I go, because those are my siblings. I love them, even though.” Her mom continues to encourage her to “have a good relationship with him, even though she knows he’s not good.”

A year and a half ago, Veronica’s mother moved to the United States. Veronica, her sister, and her mother have been since living together under the same roof.

My mom is like the nicest person ever. My mom understands. I could do- you could do something, bad. She like sits you down. And she be like- this is wrong. This is why it's wrong. This is all you can do to do better. And I expect you to do this and this and that. So, like, she has hope you know on everybody. Even if you can be the worst person in the world.

After years of physical and emotional distance from her mother, she feels a sense of love, stability, and support in her home.
All the students included in this study identified physical and emotional proximity as a key factor in their individual power and voice. Though they had varying levels of home stability, quality of relationships with family members, reliability of support systems, and incidence of traumatic events, they all included sentiment of hope and agency to move through hardships and leverage learning from their experiences into something positive for the future. Their agency is co-created through those experiences as well as their family members.

**Perspectives on Local Community Systems**

Six of the participants in this study come from Riverside, the largest sending city to Riverside Regional Technical School, and two come from Morton, the second largest sending city. Riverside is the second poorest city in the state while Morton is less poor. Riverside Public Schools, separate from the standalone Riverside Regional Technical School, was taken over by the state due to poor performance. Ren lives in South Riverside which he reports is considered the ‘good part’ of Riverside and makes sure to make that distinction when talking about it as separate from North Riverside. The students shared their perspectives and experiences in their home city.

Paul and Rose live in Morton and both reported that they feel like they live in a “nice neighborhood.” Paul expressed that in Morton:

People aren't really rude or cruel. People are nice. A lot- a lot of people seem to think that because I don't live in the same way- a lot- some kids in Riverside that I've talked with now like- they haven't said it but I could tell that they're thinking that because you don't live where we live. You don't understand. But that's not true. I do. But how you choose it? How do you choose to deal with your circumstances? That's a different story. Yeah.
Rose loves being able to walk to her local library, one of her favorite afternoon and weekend spots to hang out. Because of spending so much time at Riverside Regional Tech and feeling integrated into that community, she feels a bit distant from the Morton community.

All the students who come from Riverside are aware of the problems in their community and reflect on how they and others are impacted. As Becca shared, “I feel we have to fix a lot of things.” Ren commented on the condition of the roads based on a photograph that Veronica took and brought to a focus group, that “I see happening here is this some of the streets are not being fixed. They just keep potholes. And then everyone complains that their cars like their like popping a tire because of these potholes.” According to Nick, “in Riverside people just throw trash all over the place, like the streets are broken down. The street are ugly. They just don’t take care of the planning or more.” Last year, a large gas explosion rocked the city of Riverside, killing one person and leaving many homeless for months, including many of the participants in this study. Though they did not choose to discuss the explosions directly, it is understandable that they would feel uneasy about the city’s infrastructure and as Nick said, that the city does not care enough to improve their city planning (see Figure 3).
The notion of people not caring about the community and the concept of safety came up frequently in the focus groups. Jack has been a victim of theft and is vigilant about keeping his backpack close to him. The participants discussed the topic of driving in Riverside, which is particularly prominent in their minds as they are at the age in which getting a driver’s license is possible. Veronica revealed that:

…driving is like really scary, scary to me because like I've been in an accident before. So and some of my family like been in accidents and they've been in comas. So like to me
it's like scary because like in Riverside we don't have like people that care about- they drive reckless…It's pretty hard to like- you know here, a lot of people just drive either way- you it could be like a yellow light and there supposed to stop. They be like wooooo. And then that's when accidents happen. You feel me like I still drive, like I'm confident enough in myself to drive and do whatever I gotta do it's just like, I think like in my head I'll be like, Oh my God, I know what's going to happen because it's so easy to crash. Like I have already been in the position. Like it is my turn to turn to somebody comes like, you know, yeah. And then people I can't trust people to follow the rules.

Ren suggested that Riverside should have “…like more higher security because people there's always drug dealers around. In North Riverside, no offense. And there's always like problems that are happening. Accidents, fires. That's what I would love to have to change.”

Doris and Nick describe the Riverside community as “great.” They talked about the opportunities that the community provides for them and Nick spoke on common perceptions of Riverside:

The community is good. Not every time we have to think about the bad side of it. Because if you want to be bad, because it's because you want to be bad. Not because other people put you to be bad, you know? This community I like it a lot cause it's- not even because of Spanish, but it's a mix of both Spanish and American people. It's good to have like every like culture together. So it can be like a strong word. Some people are racist or, you know it's like, you don't get along with this. Like, you know, some people don't like Spanish people, you know, and they just disagree just for you to be in it so like they think you don't belong in like, you know this country or- Some people but not all, like you don't see that [racism] here a lot.
Nick views racism as an important but distant issue that occurs more often outside his community that has a strong Latin foundation, giving him the sense of belonging and acceptance.

Like their feelings about physical and emotional proximity of family members, the students can identify positive and negative aspects of their community. They feel a sense of agency to act along with their peers to make Riverside a better place.

**Roles and Responsibilities**

The notion that an adolescent’s only responsibility is to behave and do well in school does not translate to many of my participants’ lives. In addition to doing well in school, some of the participants have many responsibilities outside of school and wear many hats, such as taking care of family members, domestic responsibilities, keeping the family connected, and working to support the family financially.

**Fewer Responsibilities: Paul, Jack, and Ren.** Paul, Jack, and Ren have less responsibilities outside of school compared to the other participants. In their free time, they spend time with family, friends, and by themselves and do leisure activities. Jack loves playing video games and Paul is fascinated with stop motion animation. Ren and Paul play sports. They also have structured home environments that allow them to do their schoolwork and get support from family members. Paul and Jack’s families have developed especially structured and supportive home environments to support them due to their autism spectrum disorders. Though Ren has struggled with Attention Deficit Disorder in the past, his family has been a significant factor in helping him work through it.

**Extra Responsibilities: Rose.** Rose shared that she “had to grow up quite a bit faster because of my mom [mental illness], and my dad was always working so he wouldn’t be there.”
Coping with mental illness herself, Rose cares for her mom and the home when her mom is experiencing periods of struggle. As an only child, she does not have the responsibility of caring for siblings as well. Because of this and her family’s strong emotional proximity and support, she has free time to enjoy her time outside of school. She often spends time alone in the library and with her boyfriend. She also is interested in the Arts and does creative projects in and out of school. She told me that:

some adults tell me you're really smart and you really like wiser than my age. But then I also have the adults telling me that I'm a little childish and that I need to grow up. And I'm just like, what? I'm kind of like in the middle between. I don't know. And mayyyybe?"

Rose’s views on how adults view her mirrors her alternating roles in the family, since even though she needs to step up and support her mom and dad at times, she still has space to be a kid.

**Extra Responsibilities: Becca.** Becca has a full plate at home since her mother works a lot. She expresses her gratitude for mom’s support by doing what she can to care for her, and makes up for the lack of physical proximity by provide emotional proximity through her actions:

My mom works until like 4. So I usually make something to eat and she goes to sleep like that. So we don't really talk or whatever. So I'll make her breakfast sometimes. Just when I made her breakfast. I'm glad I left like a little sticky note. Like this is your breakfast. Because I felt bad so I was as I was already in bed. It was like 1:00 a.m. and I was like. Let me just do her breakfast. I have to clean the house because that's my responsibility. …once I get home, like I have to a ton of things, I go to sleep and…I have to make time
because I'm supposed to do my homework. So sometimes I'll be doing my homework at 3:00 in the morning...So like all of that just takes my time.

Recently, Becca “opened like a little business online” in which she sells clothing through social media. She currently has it public only to her existing contacts and hopes to grow it.

Becca thinks a lot about her immediate and extended family, particularly her brother, and makes efforts to communicate and strengthen relationships. “I'm trying to because they're my family. You know if I don't try probably no one's gonna do it. So yeah that's what I'm doing.”

Becca juggles the roles of being a student, support to her mom, and connector with the rest of the family. Despite the extra responsibilities, she still manages to find time to spend some time with friends and work on building her business.

**Adult Responsibilities: Doris.** Doris realizes the weight of her brother’s responsibility to support the home that she shares with him and contributes to the household as much as she can. “At my house, I'm always like doing simple stuff, like doing dishes, cleaning, and I'm doing my homework.”

She works at McDonald’s when she is not at school and uses her income to help “pay rent, bills, my phone, other stuff.” She is also saving money to visit Guatemala this summer to see her dad and siblings. She has not seen them since she and her brother moved to the United States three years ago and is optimistic that she will be able to save enough money for the visit. Other than working, going to school, homework, and taking care of domestic responsibilities at home, she spends limited time with friends and is often alone. She expressed that “some people don't have time [for sports and other extracurriculars] because they have to work after school and even if they want to.”
At age 18, Doris is technically an adult. However, she carries significantly more of the weight of household responsibilities than typical Grade 11 students and has been doing so since the passing of her mother.

**Adult Responsibilities:** Veronica feels responsible for supporting the household, her mother, and siblings.

I really don't have a support system, to be honest. I do with my mom like my mom, like she works so much and she has to because like she needs to support us. My dad doesn't help. My dad does not- not even a dollar for food or nothing. So it's just like me and my mom. And sometimes, like, I need to be a kid because I do not have a kid's life. Like, I'm basically like a whole adult.

Veronica is outgoing and social at school but shared that she does not have time for social activities outside of school. She works at the same McDonald’s as Doris and provided me with a description of a typical work schedule for her:

…sometimes they call me like when we don't have school I'd be doing a 10 hour shifts, maybe 11. Days of school I be only 7 hour shifts or 8. I get home at like 11 or something like that. Sometimes on a regular basis, 3-10[pm] or 10:30. I get- when I got out of here [school] I have to go straight to my job. I punch in. I got to [work] [at 2]:52, :53 of it right when I get there like they need me to punch in because they need my help. I work five days or four. And then when they need somebody to come in because they're short the first person they call is me.

This does not leave much time for homework or rest. “I sleep so like, maybe around 12, because when I get home, I take a shower and I do my homework. And nah I don't my
homework. I just go straight to sleep and then I'll do it fast in the morning or something like that.” Once per week, she meets with a mentor, an engineer from a local company youth program, who helps her get caught up with her work.

Veronica also makes time for helping her stepmother with her siblings from her father’s side. She spends quality time with them and provides them with affection and support.

Despite varying levels of responsibility at home, the students leverage those responsibilities as tools to further develop their sense of agency.

4.3 Finding #2: How We Learn: Connectedness and Integration

Finding #2: How We Learn: Connectedness and Integration emerged from the participants’ voices about what works and what does not work for them in their learning. The meanings of the words connectedness and integration are similar and could be used synonymously at times in various discourse communities. However, I believe that the nuanced differences between the two are important, especially in relation to the themes that surfaced from the students’ reflections on how they learn. I use the term Connectedness to describe the ways in which disciplinary learning, opportunities for learning beyond the classroom walls, human relationships, and the students’ understanding of themselves and the world in which they live are parts of complex networks and systems. I use the term Integration to illustrate the extent to which students feel a sense of belonging within these systems and the people within them, along with the agency to interact and impact these systems. One of the ways in which this occurs is through the integration of the disciplinary connections they make and application of the tools from various disciplines in real-world, transdisciplinary contexts. A thread that ties the themes of Connectedness and Integration together is the combined impact of connected and integrated
experiences in their development of agency and sense of self in relation to the world and their futures. I will discuss this thread in more detail in Chapter 5.

**Connectedness**

The concept of *Connectedness* is about students connecting themselves, their learning, and their futures to something bigger and more meaningful. The students shared a range of examples of their feelings of connectedness through their learning in the STEAM program that extends beyond the classroom walls.

**Connected learning helps with understanding.** According to Becca, “the fact that all of our classes are connected, it helps us even more to understand all of those together” and gives her power and voice. Doris echoes Becca’s sentiments: “it’s related with the same question. So I love to do that. It helps me [learn] because I had I got, like better understand the question. So has helped me a lot.” She commented that an area for improvement is that the classes could be even more connected to the question.

Ren expressed that “I just like our projects and our new questions that we have. I like how you guys format the way, how you guys want STEAM to be.” In their own words, these examples represent ways in which all the participants referred to transdisciplinary learning, with a big driving question or problem, as helpful in deepening their understandings, making learning exciting, and helping them visualize themselves connected to a larger world.

Four of the students explicitly discuss their experiences with the interconnectedness of disciplines. For example, Doris shared that “Well, for me, this is good because all the classes are like connected each other and I love that’s us, like we work in the same thing, but in different ways.” She gave examples of working on her grammar connected to her writing for her projects
as opposed to practicing the concepts through isolated, disconnected activities. “And in history. I mean, we're learning what happened in the past, not the stuff, but it's related with the same question.” Becca talked about understanding the concept of sine waves better because she was learning about them in math class and engineering class at the same time. They begin to see the Disciplines as a web that connects to the larger world rather than silos.

**Learning beyond the school walls.** The connections that all the students expressed as having a benefit to their learning extend beyond the theoretical in the classroom. Learning by physically seeing the issues and opportunities in the world is exciting and motivating to them as well.

For example, Veronica and Nick, both biotechnology majors, shared that their trips to Fortin Pharmaceuticals, a leading global pharmaceutical company, help them understand what it looks like to work in a lab as well as what kinds of problems scientists are working on now. Ren talked about the impact of working on a project with the American Electronic Textiles Organization (AETO), a research facility that is developing e-textile technologies. He also added the impact of seeing other applications of engineering through tours to the University of Technology, considered one of the best technology universities in the world, and Venus Water Technologies, a large company that specializes in water products and solutions. Becca mentioned on a few occasions that her interest was piqued about clean energy after a visit to a local historic canal system:

> It was exciting to see, like those huge things working altogether. Well, it's the samething. It has the same process of what we've built in engineering but with like small things like this. So it's pretty much the same thing. It was like really exciting. [What’s exciting] I would say the fact that people have used those for like hundreds of years. And
the fact that they use the water to power things to build, to make clothes, I think, or like to build different kind of stuff to survive during that time. So it's really interesting.

She continued to describe her connections with the impact of clean energy through a related solar project that was a focus in her ELA class “Because I've learned that we could we could actually use our power within our cities, in our school.” Connections to the past, present, and future with learning along with connections across disciplines were made possible for Becca through internal and external, meaningful learning opportunities.

These examples from the students’ perspectives illuminate the way in which learning beyond school walls allows them to connect disciplinary knowledge with real-world connected work settings. Having multiple experiences across a range of settings helps students begin to visualize themselves more clearly in specific career roles. All these factors contribute to more motivation, engagement, and ultimately their learning.

**Integration**

All the students participating in this study described the ways in which they feel like integrated, agentic members of the Riverside Tech STEAM community and the vital roles of their teachers and classmates within that system. As an extension of that community, they expressed the ways in which the integration of their learning with professionals in institutions outside Riverside Tech augmented their learning and sense of selves in the world. A thread that runs among the school, professional, and other discourse communities is that students are being integrated into those communities rather than tangentially connected. In addition, the integration of the disciplines in their school-based learning come alive in an even deeper transdisciplinary
sense as they see them in action and have opportunities to interact with them in those different settings as well.

**The Riverside Tech STEAM community.** All the participants expressed that they feel safe, supported, and valued in the Riverside Tech STEAM community. Compared to his previous experiences in school, Paul said “I felt like I've had more connections, more people, more friendly.”

Nick described it as “like a family” and Rose extended the reflection of his sentiments: we're so close knit because we don't go outside of STEAM [for classes in Riverside Tech]. And I think that makes us like a family almost because we're so well that, you know, if we don't even if we don't like some of the kids that may be in our classes or anything, we still are kind and nice to them.

Rose and Paul had difficult experiences in middle school with being bullied and felt like the adults did not care enough to take action to protect and support them, in contrast with their feelings of safety and belonging at Riverside Tech. “They are a lot more strict on it [bullying] here,” Rose expressed. Becca and Doris compared Riverside Tech to other schools in the area and indicated that they feel lucky to be in their current setting. On the topics of racism and bullying, Veronica asserted that issues do not arise often “here in school because like we prevent that alot, like the teachers.” When discussing his feelings about the school community, Ren emphasizes the continuous support that he feels from his teachers and classmates and reciprocates as often as he can.

During a visit with educators from other secondary schools and the University of Technology, one of the guests asked the student tour guides to describe the school culture in a few words. Rose and Veronica, who happened to be part of the group, shared the words “family”
“opportunity” “freedom” and “building. According to Rose, building means “building skills of knowledge and also physically building projects.” Veronica elaborated on “freedom and said “freedom to be ourselves, try new things. We are not afraid to be judged.”

Veronica loves being a student leader and feels proud to tour visitors and talk to them about the school and her work. In her words, “This school makes me want to come to school, you know?”

According to the students, the strength of the STEAM community and culture come from teachers, classmates, and the unique ways in which they experience learning. I will explore these components further in the next sections.

**Support and collaboration on school-based learning.** All the participants shared their experiences interacting with their classmates and teachers in STEAM and their feelings about them. As teamwork and collaboration is emphasized in the program, some of the students made note of their successes and struggles with working in teams.

For example, as an English Language Learner, Doris has struggled with feeling confident enough to speak in class because she worries about making mistakes. She feels comfortable with peer collaboration in STEAM because “when we work on teams and everybody have to share ideas. Write it down and explain it. Because I'm telling what I think. And I mean, for me, it's not easy to tell what I'm thinking.” Becca also described a shift in her collaboration skills since being in STEAM. She revealed to me that she has always had trouble working with others because she gets “annoyed” with people easily and likes things her “own way.” However, the culture of collaboration has contributed to her beginning to see the value in working with others:
Because they [teachers] keep telling us that you have to cooperate so I'm like, Okay. I hear people say yes. And we've tried like I tried to combine my idea with the other person. So to get like a better one, like building like with each others. So yeah.

Ren, who has historically struggled with learning in school, told a story of system of support and collaboration that he felt in a particular class. He noted that at times he “just know[s] what to do right away” and then helps his classmates. When he is having difficulty, his “teachers and friends tell me not to give up even when I’m struggling on work.” He proceeded to explain that two of his classmates “told me not to worry about it and just take things step by step. And then the teachers both helped me understand the lesson a little bit more. And so I can get the work finished.”

Veronica pointed out another classroom structure that supports the sense of community and the culture of supporting others:

Maybe me and you have like our differences, but like, I see you doing something good. Let's say you are helping Ernie or something like that. And must be like, oh, is there anybody you want to give a shout out? So I'm like, well, I want to give a shout out to Maria because she was really helpful to Ernie. So then everybody's gonna be like ohh that's cool and then we like snap our fingers and stuff. So I feel like does like something that empowers all of us. So I guess have a voice.

While Doris, Ren, and Veronica represent different learner profiles, their strengths and needs as learners are supported and extended through teamwork in the classroom. Based on the student testimony, this sense of community highlights the importance of trust and feeling comfortable enough to show their vulnerabilities with each other. In conjunction with the
community culture, the opportunities for social learning, including both peer and adult interactions, the students benefit from routines around community building.

**Student conflict in the learning community.** Paul, Veronica, and Nick illustrated patterns of conflict in the community. Paul feels that “a lot of kids my age don’t know what they’re doing” and “shoot themselves in the foot” by not taking advantage of the learning opportunities and views them as “holding it [the program] back…They kinda complain that STEAM is this way, but they're doing exactly what they're complaining STEAM does. They say, oh, STEAM isn't doing this or they're not catering to what I wanna do.” Veronica experiences the disruptive behavior of other students to be “oppressive” and having a negative impact on her feelings of power and voice.

As students choose their career area concentration in Grade 11, Veronica and Nick talked about a new subculture developed within their career area, in which they spend 50% of their school day. Nick called it an issue of “some people just don't get along with each other.” Veronica described it as a problem of “our personalities don’t click” because “there is a group that wants to be learning, like doing this and that, that, then there is a group that would be fooling around.” At the same time, she notices moments of cohesion, support, and common purpose:

…we're like, we're all into the- when we're all into the work. Like we all work together. This person needs help. Like this person comes and helps, and like we all try to be there for each other when we need to be there. So yeah.

Nick shared that “I would love to have a class meeting and about what we could change. And how can everything change in biotech? So we could all be like a fact, like a better family,
you know?” He feels hopeful that the group can come together and figure out ways to improve their class culture.

Paul, Veronica, and Nick highlight issues around community culture, individual relationships, and varied levels of student investment in STEAM and their own learning. While all three students express some level of frustration or concern about it, their tone is not one of complaining but rather identifying the problems and taking action to improve them.

**Support in finding their way in the world.** Becca and Doris find solace and support in their lives through her system of friends from STEAM. Becca shared that “I know we keep it between us like just pushing each other. When we are like falling apart. We just tried to like, you have to keep going.” When I asked her what kinds of things make her “fall apart,” she replied:

Very simple. We have a lot of things going on at home. Some of us or from the school, like we just like we help each other. If someone wants to talk with me, we meet at someone's house, usually my house and I'll cook something and just talk about it.

When the topic of earning a driver’s license came up at our final focus group session, Nick, Jack, Rose, Veronica, and Ren engaged in an honest discussion in which they revealed their fears, failures, and successes in the process. They proceeded to offer words of emotional support and specific advice about studying for the test. Jack expressed his views on preparedness and conquering fears through his own experience:

So I've learned one thing that like- in order to like face your fears, just imagine every possible scenario. What could happen to you? And then you be like less scared of it because you- you are prepared for that. And rather like just, just try to find some humor in order to like reduce fear.
This example about giving advice about obtaining a driver’s license illustrates the bigger concept of community: students feel comfortable and safe to share their worries, failures, and successes around common experiences and take the time to provide their tidbits of wisdom to each other. They take a collective rather than competitive approach to supporting each other in finding their way in the world.

Teachers. All the participants talked about their teachers as being a significant factor in their development of agency, specifically through giving them a voice in their learning, a sense of belonging, a belief that they can succeed, and the tools to get there. In Veronica’s words, “I feel like you guys [STEAM staff] all are trying to do your best to, like, empower us. Or like try to make us feel like we belong to something.” She also acknowledged that she appreciates that teachers “make opportunities” for them to have meaningful learning experiences that connect to the world outside of school.

The students expressed that the teachers listen to them, value their opinions, and use their suggestions to make decisions for their learning. Paul explained that “the hook of STEAM” is that “it’s more personalized…it caters to your interests,” therefore “it’s their [teachers’] job to care.” Becca shared her thoughts on her teachers and why they give her power and voice:

The fact that they reach out to us. Or like to do things we want but learning at the same time instead of like putting your things only on you, you guys. Yeah. And I feel like that gives us like we feel comfortable talking to, to you. And like for example if we're like having problems with something we can just reach out to you. We have like the confidence between the teachers and the students. Yeah like, I think that's important because some schools really just don't care about it.
Veronica discussed similar sentiments about “being heard” by her teachers, and they listen to her ideas about how to improve her motivation in class and implement their ideas. When I feel like in class I’m- they say I’m not being productive or something would be like, oh, I have an idea. I feel like we’ll be more interested in this. And then like for the next class, the teacher thinks about it and then they try to, like, make it happen.

She then recounted a moment in her ELA class in which she started to lose interest in a book that they were reading. “I told her we should do something hands on, like during the book and stuff.” Soon after, students were using art and building supplies to physically construct their interpretations of the text. She and her classmates also suggested a new mindfulness routine for the beginning of class to help them transition into the learning mindset.

Rose contrasts the STEAM experience with traditional schools when the only voice in the room that has power is that of the teacher’s:

And they give it to you and you have to sit there trying to figure out. And I feel like that sets boundaries for students because it's making them seem like they don't have a mind of their own. And I think that's what's where schools do feel like a factory when we're being told what to do.

Nick commented that he has been motivated by teacher encouragement to try new things outside of his comfort zone that are challenging, when a teacher “always put me like this- this good energy about it…oh yeah, you should do it, you should do it, it’s a good opportunity.”

During our last focus group meeting, Jack reflected on a photograph taken by Doris on the window of one of the teacher’s classrooms, saying that the “quotes on the window actually make you more inspired rather than looking outside” (See Figure 4).
The students’ testimony reveals that from their perspectives, the teachers have a significant impact on their development of agency. The students identify a mix of high expectations, personalized support, value on a strong sense of community, and the teachers’ genuine respect, care, and interest in the students’ ideas and opinions that contribute the high impact of their teachers on them.

Figure 4. Inspirational classroom window quotes. Photograph by Doris.

Rose reflected on one of the photographs that I contributed to the final focus group, in which she and a small group of students, including two participants in this study, were invited to help the teachers who were struggling to determine a guiding question for their transdisciplinary project for the second trimester (TDP2). “And that was really pos- that was like a really positive impact because it was nice to see that the teachers are reaching out to us to see what our opinion
was on what we want to learn and what we want our question to be based off of.” Though Ren was not part of the small group that narrowed the questions down, he took the survey of the two finalist questions that was sent to all Grade 11 STEAM students and mentioned it as being a time in which he felt power and voice as well.

This example that students brought forward as an instance of when they felt power and voice further illustrates the depth of integration of the students into the STEAM community, and specifically as agentic members of the community with voice in their learning. In this example, teachers step back and allow students to take an important role in major curricula decisions. This activity also serves a dual purpose of helping students understand the ways in which the disciplines can connect and thus become integrated under a transdisciplinary question.

The Riverside Tech community is a strong subtheme of Integration. As I explained in this section, the impact of the teachers is a significant part of the students’ development of agency. Along with that, collaboration with, and support from, adults and peers in the community makes
and contributes to success with school-based learning and finding their way in the world. Some of the students identified conflict within the community and a desire to make improvements.

**Integrated structures and ingredients for motivation and learning.** During our initial group chart paper brainstorm of what gives and what takes away the students’ power and voice from their perspective, one of the sticky notes that landed on the power and voice paper was “crave for knowledge.” That sticky note sparked my curiosity as to what the students would say about how they get to the point that they “crave” learning opportunities. The students’ reflections on how they learn suggested to me that creativity, open exploration, failure, iteration, and attainment of success are key factors in increasing their motivation and growth mindset.

Rose shares her views on creativity and how her interests come alive for her in school and spill into her time outside of school as well:

I've always been a really creative kid. I like building things outside of school. I build things, do art and stuff. where since we have engineering, we have to, people have to draw, even in biotech. We have to draw things out sometimes. Draw what we saw in changes and stuff. And that encourages me more to want to do more art, because before STEAM, I wasn't doing that much art anymore. And now I'm just designing things and I'm having fun doing it outside of school. So kind of like went into my outside of school life, too.

I feel like creativity is like one of the biggest things that drives the world. And people just completely forget about it. It's like once you hit high school, usually there's no say in most high schools. There's maybe band and chorus, but there's no like Arts program. For engineering sketch you're making, like building. So with creativity, you you draw like whatever is in your head. You put a piece of paper, what you want to be where, how
you want it to look. Like when you're painting on a like canvas, it's literally like that.

What do you want on it? Where do you want it? Do you want it?

Rose can conceptualize and articulate the ways in which creativity and the Arts intersect with biotechnology and engineering, for herself as an individual and in the broader world. She goes on to explain how her sense of creativity helps her succeed through cycles of failure and iteration in open science experiments.

[In biotechnology] we always are going to have to think of new ways to do things because like we've done the ELISA [experiment] three times already. And we've pretty much failed every single time. We've gotten results but they are not the type of results we were hoping for. And we have to keep thinking or a new way to do the project and how to do it because if you're going to have to come up with a way to do it, because it's just not working with the way the kit says it to work. You also have to be creative especially if they [teachers] ask you to actually write your own procedure.

In her comments about the ELISA experiments, Rose reveals her sense of agency that is developed through teachers incorporating an inquiry approach in science experimentation while also ensuring that students can follow Standard Operating Procedures (SOPs) in the lab. Also, after several attempts at generating useful results, Rose’s teacher encouraging students to question the accuracy of the SOP provided to them by ‘experts’ who developed the science kits and try it in a different way. Thus, students learn to read and write scientific procedures.

Ren likes openness and structured choice in learning. He elaborated that “there are some like prompts that we have to follow, but it's really fun to be able to take something and then create something out of it that's your own. I kind of like to get creative.” Nick commented on a photograph of himself using visual art to express his feelings about positivity and negativity. “I
think I have this (inaud) here is a crazy because I wasn't even even know what I was making in that moment.”

As students who have traditionally struggled with learning, Ren and Nick both indicate that a balance of openness and structure help them succeed.

Nick described a project in which he struggled and emerged with a sense of confidence and ability to succeed:

But I didn't got it, I didn't got I had like a few struggles with it. And now and now I can actually explain and have a lot of you have more details. [It] means a lot to me because I knew what I was doing. And I pipette my gel the, the protein into the gel and I got my results. Now, what I could change about this project is that I could do it even more very better than I did it the first time, because I would love to 'splain this project because the first time it didn't wet it. Then it went well. But now I could 'splain to you and think and think about what I could change in life and how I could change this to the world.

Veronica “love[s]” her career area concentration and Nick feels that “it means a lot to me because I actually learned from it.” He identified a cycle of his interest being sparked, leading to effort, leading to success.

According to the students, elements that contribute to their motivation to learn include inquiry-based projects, openness and structured choice, opportunities for creativity, and challenges that embrace failure and encourage iteration.

Unproductive struggle.

Rose also feels that in the Riverside High STEAM program, “the teachers are really good at empowering us because they're just like, they want us to do our best and they don't push us
past the point where, like, we get overly stressed, but they push us enough to push us farther.”

All the students also articulated ways in which failure and struggles in learning lead are not productive and have a negative effect on their sense of agency. These are instances, both in STEAM and in other schools, in which they continuously fail and do not yet have the tools to attain success.

For example, Rose is still facing challenges with understanding precisely where she is in her learning. She attributes this to the ways in which the proficiency rating system works rather than the frequency and quality of teacher feedback.

When sometimes like, not like the grading system, but being told that like a you're like developing. It's kind of hard to understand where you are developing wise because you could be really close to mastery or you could be really close to emerging. And that's where like the percentages is easy to understand because you know that you're like closer to being mastery.

Nick talked about feeling “stuck in the [class]room like forever” when the class is long and there is too much teacher talk and not enough active learning. “And like sometimes you're tired. Sometimes you know you do this. And you don't want to have somebody talk to you for like an hour, you know?” He also shared that “sometimes in some classes I'm like down…Like a work that I don't know how to do. I like to put my effort on it to see if I could do it. If you could do, I could do it.” He also expressed frustration when he continues to try to understand something new, but even with teacher support his confusion does not get clarified. For Becca, it is “when I couldn’t do my homework, I couldn’t understand it.” Similarly for Ren, “the times when I don't feel like I have power is when I don't know what I'm doing and sometimes struggle and have to ask questions, even though asking questions is not bad.” Doris’s struggles are chiefly
language-based, and while she is in a place where she is beginning to feel more success as an English speaker, she reflected on previous experiences when she was in a different setting and at earlier stages of L2 development:

I didn't know too much English. It was hard for me like to ask teachers what am I doing. I mean, relations with other students and all that stuff. I feel like this is what- sometimes I don't understand what's going on in the class. So I feel like I'm stupid because I don't get anything from this.

Doris gives us a window into her world as an English Learner that mirrors the experiences of many others who are working through struggles with confidence and self-efficacy as they take on the challenge of learning new ways of being and communicating within a different culture.

Like Doris, Ren, and Nick, Paul also experiences moments of self-doubt and emotional shutdown. Paul’s low points are usually connected to his feelings of not being successful with independently planning and organizing his work:

[my] lowest moment where I like I have a lot of work and I feel like if I just done something different, I could get it done. Like when I know that I can do something, but like I just because of poor planning or just underestimating the work, it kind of falls apart like I have to do- this is due tomorrow and this is due this day to that day. I get overwhelmed. I'm like, okay, I can do this. And then I try to do it. And it's just like I'm like my pride tells me I don't want to- I don't really want help. I wanna be able to do it by myself. I kind of mess it up.

Though the specific circumstances around these moments of frustration differ from student to student, the common thread that emerges from their comments is that productive
struggle becomes unproductive when students do not feel the confidence and/or have the supports and tools to find their way through.

Integration with the world beyond classroom walls. This sub-theme is about interactions that are deeper than going on field trips. It is about students being actively involved with and making an impact or contribution to real organizations and professionals beyond the school community. I will share some examples of this pattern in the voices of Nick, Veronica, Paul, Doris, and Ren.

Paul described the impact on his self-confidence from participating in exhibitions of student learning and presenting his work at other schools:

Well, I guess I like the exhibitions, the exhibitions when I present my work and I see that my goal is to explain to people and able to present the work and stuff. I feel proud that I'm able to do that and able to go. And even then, that's why I've had I've gone on field trips to go and talk at other schools. I'm glad I've been able to break out of my shell and get enough self-confidence. Speaking from other people, I'm really glad. I think that some form of success that I've become more confident.

Nick also talked about feeling confident and most enthused after sharing his learning with a public audience:

The moment I-I felt the most excited was the exhibition. The first like the first one in freshman year was I mean, I meant the second and the first one was good because actually was spoken to a lot of people and like getting to know somebody and then having someone, they used to come in to the Exploratory. So I talked to them in the STEAM- the exhibition. It was the first exhibition that was so good because I actually learned, you know, this couples of months and stuff. And yeah, like every time every
time like- like a parent used to come and see our project. I used to talk to them. And I was learning about everything. I was like on point.

Doris shared Nick’s sentiment about her first student exhibition as being the most exciting moment in the STEAM program. “…So we working, all of the student together on that. I haven't been one before. I feel like, I feel really good you know, you're showing your work, you knowledge, and other stuff. Yeah. Ren also “…love[s] our exhibitions. Mostly the exhibitions to present our projects to other people who don't know what we have on what we are doing.”

For Veronica, her experience at her Grade 10 TDP3 exhibition was “pretty like an amazing moment.” She went on to explain that “we were all was connected and it was more special to me,” in reference to the successful integration of the disciplines in the project and sharing it with her loved ones. Her mom, with whom she was recently reunited, was able to attend, as well as her mentor from outside of school.

I was proud to show her. I was like, oh, look, I did this. And then she thought it was so awesome, like what we were doing with the bioreactors. I like the fact that they all thought it was so cool and they were asking me all these questions. And I know the answer to it. And I was like yeahhh so like, that made me feel like really good about myself. I was like, oh, look, what I'm doing it pays off.

Veronica also talked about feeling empowered by taking a leadership role in the exhibition planning and working with her teacher and classmates to implement improvements to the process. The exhibitions in the past involved all of the students and often led to conflict and unproductive struggles.

I remember I think it was with Mr. Johnson and he was like, oh, like a committee. I was like, yeah. Why not? And they're like, now we have an exhibition committee. So it's kind
of like less stress on like all of our students to like try to put all of it together. But now we have a group of students that we like, OK, so everybody's gonna do this and this and that. And they're like people in charge, you know? And like, it's easier for like the other students instead of all of us, like, you know, getting together and everybody having like fighting about, you know, I want this or that. Like, it's just a little the more little group, like we could talk to the other students after and be like, OK, guys, you think this is a good plan or not?

In addition to having a voice in planning events, students also commented on instances of having voice in planning curriculum.

Ren and Doris talked about the impact of their Grade 10 TDP2 project on their excitement to learn and self-confidence. The project was designed in close collaboration with AETO, with the purpose of the students learning about the e-textile technology and working in teams to apply their electronic and engineering design thinking skills to develop a conceptual and looks-like prototype of the product using the e-textile technology. Students created multiple iterations of their designs and traveled to AETO for expert consultation and feedback sessions. In addition to the work in their engineering class, students focused on storyboarding the user experience and developing presentations for the staff at AETO. “Trying to make it in our own way, too, and then present to them the next time we come back” was an aspect of this project that stood out to Ren, as he felt that his ideas mattered to experts in the field and that he had the ability to create something new.

Veronica and Rose felt empowered by experiences in which they had the opportunity of a public platform to educate experts in the education field about effective teaching and learning. In Veronica’s words:
So like, these pictures spoke to me because like here we have Aaron, Rose and myself like talking to these people. They come from [South American country]- I think it was like they wanted to show like basically like transform one of their schools to be like us. So this is something that we can get the word out of, like our shop, but not just like our teacher. And it's like more meaningful when we do it because it's like we're trying to get the word out ourselves.

After the visitors left, Veronica was glowing when she told me that one of the delegates from the ministry of education extended an invitation to her to come to her country to speak to an even wider audience.

Another example of presenting to educators was when Rose had the opportunity to join a small team of her classmates last year to present their TDP1 project at an event on personalized learning. She had recently transferred to STEAM from another career area at Riverside Tech and reflected on her transition and her excitement about:

[Talking] to people who are really important in the development of programs like STEAM. And it's important to me because I was in a traditional shop not that long ago. Just coming into STEAM and being able to go to [this event] and explain what we've been doing with a deep understanding. It's crazy because I was very confused, like what's a bioreactor? What is s. Griseus, where did the war in Syria come in and then I kind of started to put the puzzle pieces together. You know, I only came in like the middle of the project.

In this section, I presented Finding #2 from my data analysis in this study, focused on experiences of connectedness, integration, and success within the school community and the world beyond reveal ways in which students report that they learn best. Another linked factor in
how students learn and their sense of agency is their mindset about themselves in relation to their experiences and how they cope with challenges. In the next section, I will share these patterns in the students’ mindsets and views about the impact of successes and challenges in their lives.
4.4 Finding #3: Our Mindset: Resilience and Positivity

The third finding in this study is about the students’ mindsets, specifically, how they cope with trauma and how they perceive their sense of agency as marginalized youth. I will begin with the first theme, *Coping with Trauma*, sharing their perspectives on the effects of trauma on their lives. *Conquering Challenges* is centered on the students’ resilience alongside their conviction to keep moving ahead in life, despite challenges, and the belief that they have complete power and control of themselves and how they deal with obstacles in their lives. I will end with sharing the students’ desires about what they want in their lives and how they want to be viewed by others.

**Coping with Trauma**

As I discussed in my first finding, *Who We Are and What We Carry*, most of the participants in this study have experienced, and/or continue to experience, significant trauma in their lives. In this section, I share select stories of struggle and hope as they cope with trauma and its effects on their social emotional wellbeing and learning.

**Doris.** Doris continues to mourn the loss of her mother, who she lost three years ago due to cancer. She elaborated on her feelings of grief when I asked her about what kinds of things are hard for her.

Sometimes I want to just focus on my work. But then I'm still like remembering my mom. And how she passed away. Sometimes I would be like happy and all that stuff with my friends and then someone ask me like what about your mom…And I was like, OK. I'm just gonna get out of here because I don't want to hear it. So it's hard for me to be like
that. Sometimes. And somehow- and sometimes it affect me at school. It does. It still does. Sometimes I feel like I can't keep going. But then I just think that I don't have no choice. I have no choice!

Doris selected a roll of photobooth pictures that she took with her brother for reflection. The photobooth roll sparked a range of emotions for her, which she took as an opportunity to articulate (See Figure 6).

Figure 6. Photobooth reflection. Photograph by Doris.

In many ways, Doris’s reflection on the photobooth pictures captures the essence of how she makes sense of the traumas with which she continues to struggle. She identifies the fractures...
in her family, feelings of loss, but at the same time shows resilience and hope as she shares the
deep value of her relationship with her brother.

**Rose and Paul.** Rose and Paul endured intense bullying in middle school and neglect by adults at school. In Rose’s words, “but I learned, my perspective of the world changed significantly after middle school and then coming straight here because I was bullied in middle school. But then once I hit high school, it was so much better.” Paul experiences lingering effects of his experiences, sharing that “How you feel on problems can still hit you no matter where you are.”

Both Rose and Paul feel safer and more integrated into the Riverside STEAM community but are still making sense of their past experiences that emerge at times and impact their interactions with others. For example, sometimes Paul questions the intentions of others and is cautious about forming deeper relationships with peers.

**Veronica.** Veronica continues to wrestle with the impact of abuse, neglect, and instability with her family. During our discussion about things that are hard for her in life, she talked about feelings about difficult family issues that pop into her mind and are emotionally flooding.

And my learning just stops because everything is on my head and I'm like. Like, I can't focus. And sometimes, well, it depends what it is. But like me, I'm an emotional person. I don't like to, like, fight or try to like get angry and hit somebody. Like me- I prefer to cry because I don't want to hit somebody because me like if you hit me like I'm gonna defend myself, and stuff, but like instead of, like making a whole fire or whatever over something dumb, I get emotional. Oh, yeah. It's okay. I get emotional. I don't know because I just prefer to cry instead of um- Because I'm not a problematic person, but I feel like that's my lowest moments to me when I let stuff like that get to me because I'm
so passionate about my work and like letting stuff like that get to me. I feel like I'm not doing right because I'm always like outgoing. I'm like come out do this and I'm gonna do it and I don't give up until I actually do it. And if I let stuff like that get to me, my mind is not there. So I don't give out the work I want to give. I just do something that's like I don't feel confident about. Like this year- I feel like this year has been my lowest moment of everything. Like, I know some of the teachers noticed and stuff, but like, I'm trying to get back on track because I been so like on this only I get-

I feel like this year has been my lowest moment because like I I've been going through stuff like in my house, stuff like with myself and then stuff in school. And I feel like I'm so overwhelmed that like I've learned stuff like that get over me. Like sometimes I'm not even like, you could be talking to me and I'm like, just thinking about like real (sighs) my problems are home and like thinking about whatever was going on. And then like, I forget everything I'm doing in class. So I feel like that's stopping me from being where I want to be because I want to do great stuff. When I got out here and I've been missing a lot of days cause I've been sick and I feel like does bring me back.

Veronica is determined to be successful in school and beyond and juggles many responsibilities outside of school. She often turns to work as a productive escape from her current problems and past traumas, but those issues rise to the surface at times and can distract her from her learning. Her stress and exhaustion also cause her to get sick and miss school, launching her into cycle of missing more learning and getting overwhelmed with her responsibilities.

**Becca.** Becca does not like to dwell on negative things in her life. However, her description and strong feelings about rejection, neglect, and other traumatic events in her mom’s
childhood mirror her own experiences:

At some point something happened in her life that made her like change. She never talks about it. And yeah, I feel like I don't really know much about my family because since my dad died when I was like 10, he didn't know his dad either. He was alive but they never like made the connection until like before my grandpa died. I never knew him either. My mom's side of the family, she doesn't talk to her mother cause like her mother. She was 16 when my grandfather was 40. So once they got married, they had like three kids and like, they just, I don't know how to explain it. My-my grandma was just like tired of the kids and she just left. And we just come up like once a year, like, hi, I'm your mom? I don't know. I don't know how that works. I don't know how you could have a kid and just like throw it away.

So I don't really know. I'm you know, I don't really ask things about that. That's like really personal for my mom and, you know, to her. She had a time where she lived with her mom. She was like seven. And her mom got married to another guy and that raped her. She thinks I don't know none of this stuff but I just don't want to bring it up. And they still were together and had like seven more kids after that. So, you know, I don't blame them for not talking to me about that side of the family. And my grandpa died when I was like one year old. Yeah.

The pattern in her family of abandonment, untimely death of parental figures, fractured family relationships, and sexual abuse is evident in Becca’s discussion about her mom. Becca’s strategy for coping with trauma is to push aside negative feelings under the guise of being “positive.” rather than processing them. In the above quote, she appears to be processing her own experiences through discussing similar problems that her mom faced. When talking her mom’s
life, she was able to show feelings of sadness, disgust, and empathy regarding trauma that she does not bring forth when talking about her own life.

Rose, Paul, Veronica, and Becca’s stories give insight into the ways in which trauma and struggles can affect their ability to be present in school and in life. At the same time, their resilience and mindsets about their challenges pull them out of those moments and into the present.

**Conquering Challenges**

Just as I began noticing a pattern in the photographs that the students had selected and their interpretations of them, Veronica and Rose noticed the same trend and brought it to the group. In Veronica’s words, “I feel like we focused more on what empowers us.” “The pictures that are missing from all of these pictures is things that bring you down…People were more willing to take pictures about what makes them feel positive,” Rose conjectured. In fact, there were significantly more photographs in the “empowered” category, and those that were depicting something negative were frequently categorized as “in the middle” in acknowledging the struggle but expressing the learning or strength that they gained through experiencing the struggle.

As I dug more deeply, I uncovered a larger pattern around the students’ resilience alongside their conviction to keep moving ahead in life, despite challenges, and the belief that they have complete power and control of themselves and how they deal with things in their lives. This led me to my interpretive theory of *collective bootstrapping* that I will discuss in Chapter 5: a different take on the American individualist notion of ‘pulling yourself up by your bootstraps’ juxtaposed with critical perspectives that reject and speak out against the concept.
In our initial group chart paper brainstorm (See Figure 2), students posted sticky notes with the words “laughter and smiling,” “brave person,” and “fearless” to illustrate what makes them feel as if they have power and voice in their lives. One sticky note read “negative thoughts” as what detracts from feelings of power and voice. Rose finds that “it's a lot harder to do things that bring me down, than bring me up. Nothing. Because, I mean, if I change something, it would change how who I am now and if I change something like- it's better to learn from your experiences, then to try to change them.” Despite the struggles that have had in their lives, Ren and Becca told me that even if they could, they would not change anything. Nick likes to think of himself as “a happy person. Always positive about everything. Everything that comes on my way. I don't think as a bad way. I think I was challenging myself about it.” The same applies to Becca, as I discussed briefly in the previous section. Becca stands by her belief that it is better to avoid giving attention to the negatives in life:

I don't really focus like on the negative things. I feel like the more you keep looking for negative things, you are going to find more negative things. So if you just go like on the positive side, you're going to find more positive things. So that's why I don't really you know, I try not to look at those things.

Becca is committed to her approach for overcoming challenges, regardless of the possible long-term impact it could have on her social emotional wellbeing.

Ren and Rose gave examples of how the power of their mindsets have helped them to overcome mental and emotional challenges. Ren struggled in middle school with Attention Deficit Disorder (ADD) and anger issues. He explained that he was eventually able to overcome his challenges and no longer needs medication to treat his ADD. Rose set herself free from negative labels to a reframed sense of identity:
When I was younger, I used to be told I was defined by my mental disorders. Now I define my mental disorders. I can understand people's emotions a lot more cause of my ADHD. And I look further. I have better time doing empathy with people. Not sympathy, but empathy. Trying to fit myself in their shoes. And it makes it a lot easier for me to help them. And so I like to think of that as like a superpower that I can help other people with my ADHD. And so I don't like to, like I take medication to help me manage my bipolar and ADHD. But I don't like to think of those things as things that's been defining me all this time. I used to think that, but now I don't think that because I know that my mental disorders and my medication don't make me who I am. It's how I use them. And my personality and stuff is what defines me.

Rose’s description of her paradigm shift about her ADHD and bipolar disorder illuminates the importance of fostering agency to support adolescence identity development. She sees her perceived deficits instead as strengths that develop her emotional intelligence that she can bring to support others.

Veronica views her driver’s license as a symbol of breaking into a new level of independence from her parents and a sign of her coming of age (See Figure 7):

For me, if you like, from going to this paper, to going to basically plastic- I feel like I have more liberty because when I had my permit I had to drive with a parent and I like, oh, you have to be home at this time, like you can't drive let's say from like 5 in the morning to blah blah blah. Now that I have my license, I'm able to do stuff more on my own. Like I have some- some restricts. Like I can't drive with my friend to a house six months from my license. …But for me, I feel like I've become- I've seem more like my adult side…And like I've learned, how to like, set a mindset, take a positive mindset and
actually accomplish it. So like when I got my license, I was like, oh, I did this I paid it. I did this myself. Think I don't need to depend on like my dad or whatever or my mom. So like that makes me feel like I'm getting older. You know? Yeah.

![Figure 7. Driving permit = freedom. Photograph by Veronica.](image)

In essence, Veronica’s driver’s license represents her commitment to achieving success in life and serves as a concrete example to her that her goals are attainable. In a more practical and literal sense, the license also provides her with the opportunity to have control over her physical proximity with family members as it gives her the independence to make those decisions.
Paul yearns to gain independence and have a clear sense of self while learning new skills to help him with his ASD:

I want to learn how to be successful on my own. Not saying I don't want help, I'm just saying I just want to learn how to be able to get to that point where I understand myself. I want to be able to do work and take pride in the fact I did that work. I don't want to feel like I'm useless, stupid. I like it. I don't want I don't want to. I think that's my greatest fear- feeling useless.

Paul talks about his desire to have a stronger sense of his own identity. Though his sense of agency around his identity development is not yet to the point where Rose has reached, his identification and awareness of it is the first step in that direction.

Becca feels lucky to be a student at Riverside Tech. “Studying engineering at such a young age. Not everyone has the same opportunities to do it. So, yeah, that gives me a lot of power to keep going.”

Although Becca has since changed her concentration to biotechnology within the STEAM program, she was able to identify what she gained from engineering as well as what seemed to be a better fit about biotechnology. She had the agency to advocate for herself and change paths.

Doris has been working to develop her English Language skills and achieve in school. She shared the picture that marked her first external recognition of academic success: “So I took this pictures. One of these is a certificate. And this really means a lot to me cause this was my first certificate in school.”

As she has faced some obstacles in school with her English language development and her lack of confidence in herself, this certificate represents for Doris a new dimension of her
identity that is just beginning to bud. It involves a paradigm shift to now being able to visualize her success with the English language and a boost in confidence and self-efficacy.

Nick puts importance on the ways that others perceive and value him, always striving to be considered as ‘positive’:

In the school I like to be heard about good things. Like if we're doing like a project and my opinion is the only one that everyone really likes, like stuff like that. You know, in big groups and I express myself and anybody who listens to me, you see, that is a positive and a good way to start the day. Or we could do this project by- [it happens]a lot, a lot. I respond with like a positive and an addit- attitude. Like a good way of attitude talking. always like talk to people nice and stuff.

The concept of staying ‘positive’ that emerged through the students’ individual reflections permeates into their shared culture as something that is respected and valued. They use this mindset to cope with challenges and keep persisting in their lives.

Success is a choice.

Nick feels that no matter what challenges life presents, he will “never give up.” On the challenges that people face in his community and the ways that they face those events, he contends that “…in this world, if you want to do something in this world you could do it, you're free to...Because if you want to be bad, because it's because you want to be bad. Not because other people put you to be bad, you know?” According to Paul, “I’m in charge of my own future.” He has strong views on the ways that people deal with hardship in their lives and how they should view others:

And I feel like I've learned that with other people they can't really hold you back or oppress you unless you allow them to. But how you choose it? How do you choose to
deal with your circumstances? That's a different story. Yeah. My dad grew up in a lot of areas that you could say were worse or almost about as bad as with Riverside, but the same with my mom. But [it is not] the only area that has troubles…you can't use as a crutch… It's like some people say- when people say, oh, well, my experience is worse than you. It's not about which is worse. What you define it worse if everybody has something they struggle through it shouldn't be a contest. It should be trying to figure out how we can both go over that. So there's somebody that I've let's say I have a friend who's like has a lot of money or he's poor. He says, oh, well, you don't experience it. That's not true. You don't understand how I feel. That's not true. I have all these things, but I still feel this way. They should say that.

Paul places great value on his belief that every individual, no matter what their circumstances, have complete control over their futures. He also feels it is his duty to help others embrace his view and show them the way to self-improvement.

Veronica agreed with Paul when he expressed his thoughts on their responsibility to help others, including loved ones, make changes in their lives:

And I think before we have- make a change for that, that we should help encourage other people to make the change. We should make the change within ourselves first. And even if other people don't follow that example, we at least try to lead by example. We try to do that. If you change yourself, you can help change your family. Your family can help change other people. And that could just increase from there.

These examples show a strong sense of individuality and beliefs around control and choice in life, even to the point of being responsible for being role models and leaders in their community. They hold a shared value on making good choices and view it as shameful to use
disadvantages and difficult circumstances and a reason for not succeeding. The students carry this into their specific visions of their own futures that are marked by personal success and positive impact in a more global sense.

In this section on Finding #3: Our Mindset: Resilience and Positivity, the student testimony brought out some themes that shed light on their ways of thinking about themselves. In the examples that I shared, they identify traumas and the ways in which they may affect their social emotional wellbeing and in turn, their learning. The students also discuss the ways in which they overcome these obstacles, such as through having a positive mindset and an optimistic view on the world. Another important component of conquering challenges that was raised in the examples is that of thinking about those difficulties as strengths that help them to develop their identities and emotional intelligence. Another important subtheme is the view that success is a choice, and that it is in the complete control of people to rise above any challenges and help show others the way as well.

4.5 Finding #4: Seeing Our Future: Visualizing Clear Pathways to Impact and Success

Seeing Our Future: Visualizing Clear Pathways to Impact and Success is the fourth and final finding in this study. In Visualizing a Successful Future, I will explain how the participants articulated clear ideas for their futures and were able to visualize themselves as successful and productive citizens. In Anticipating Barriers, I will describe how they also identified potential roadblocks to their success and outlined plans for breaking through or around them. I will close with Hopes and Fears, with two participants’ brief summaries of their innermost thoughts on their futures.
Visualizing a Successful Future

The following concepts emerged as elements in the participants’ ability to visualize a successful future for themselves: engaging in connected, integrated projects related to the real-world; apprenticing in career areas; successful adult modeling and mentorship; experiencing real workplaces with professionals across different industries; and wanting to make a positive impact on the world. In this section, I will share some profiles that the students constructed in visualizing their futures to illustrate the above factors.

Ren. Ren wants to pursue a career in mechanical engineering. He enjoyed engineering projects at Riverside Tech and chose engineering as his concentration this year. He talked about three adult mentors at school who are experts in the field and have inspired him to visualize himself working in assistive technologies. Ren spoke mostly about his engineering teacher, Mr. Dinem, who worked at different universities and led an assistive technologies program. He also mentioned another teacher mentor, Ms. Harper, who exposed him to mechanical prosthetic arms. In addition to helping others, he hopes to help his family at the same time:

I kind of like to get creative and try to make contraptions like kind of like an-an arm for when people have strokes. They could- they can move like some parts of their body. My grandfather had a stroke one time and- I- since there was a mechanical arm that can make your hand move when you had strokes. I want to try and make my own and try to test it to see if I could put on my grandfather so he won't have to have my dad or my grandmother and other family members struggle to help him to get to places.

Ren went beyond his surface-level interest of the broad field of engineering and was able to clearly identify a specific application of engineering that he wants to pursue. He was able to articulate a clear sense of purpose that he would have working with assistive technologies which
includes helping a family member. He had multiple teacher role models who inspired him and provided apprenticeship opportunities for Ren.

**Rose.** Rose plans to become an environmental engineer, have the financial power to purchase her own home and adopt children because “some kids don’t have the same chance that I have in life.” Though she chose biotechnology as her area of concentration, she usually integrates engineering into her choice projects with the support of her teachers.

…what I want to do in my future…is take biotech and engineering and put them together to make something new. And it can provide me opportunities to improve my life because it proves that what I'm trying to make a point about I can do.

Rose also interacts with one of the engineering teachers, who is a civil engineer with a specialization in environmental engineering, and they have had discussions about ways to structure her learning to help her pursue her interests. She cited her participation in the summer internship at Riverside Tech, focused on clean energy through developing algal biofuels, along with her outdoor experiences with her grandparents, as her reasons for deciding to pursue environmental engineering career:

Over the summer when we did the algae stuff. I always been connected with outside because like when I was a kid, I used to go over my grandparents' house. They have a poolside of the outside a lot during the summer over their house. And I like gardening with my grandmother. She likes to plant like tomatoes and flowers and stuff in the spring. And that kind of connected me a lot to nature. And then being able to go out like see what they- we were taking things from nature and creating to something that's going to hopefully save us was really cool to see. And it's not something I've ever done before. And it was kind of like after that summer, I was like, I want to do something that's
environmental safety and stuff like that. And so I know I like building things and I'm really hands on like that environmental engineer, because I knew that was a profession.

For Rose, it was a combination of hands-on experience with environmental engineering, her connection to nature that was cultivated through family, and a teacher mentor who has actually been in that career that helped her to identify a successful future in which she is excited.

**Nick.** Nick’s first visit to Fortin Pharmaceuticals was a moment of significant learning for him, sparking his interest in biotechnology and motivation to work hard in school.

When we went in there I saw all the labs that I like to do and a lot of the machines that I want to work with. And I was so excited and I was like, oh, I want to do this. I want to do that…help people with medicine and people to succeed in life.

In addition to pursuing a career in biotechnology, Nick is inspired by his participation in JROTC and his stepfather as a model to spend time in the military:

I do like JROTC, which is like an army- army program. They go in and they train you to be- to go to the army…I want to get to experience how it is because my stepdad always used to tell me about it because he went to the army for 10 years. So he always talked to me about it. Go, you should go, you should go. You know, it's risky, but- Well, I want to challenge myself. Not like- I'm thinking about just not like going right away- but like I wanna have like a- like a two year career about biotech and like- or four-and then go to Cause you know- But I want to do- I just want to keep on like focus on biotech. I just want to do the army, too. So I might do both. Little by little, you know?
Nick toys with the idea of pursuing biotechnology while also following the footsteps of his step-father, an adult in his life in whom he has the utmost respect. Though he has not finalized his decision, his reasons for each path are clear, purposeful, and realistic.

**Veronica.** Veronica has visualized her future career long before her time at Riverside High, but her experiences at school have presented her with an additional path that she is considering:

…always wanted to be a pediatrician, but like Miss Charlton and Miss Maloney are opening another side to like biotech and like science research type of thing…But like my dream has always been to be a pediatrician because like I want to help people and I love being useful.

Like Nick, her interest in a potential biotechnology career was piqued by her experiences at Fortin Pharmaceuticals. She noted that multiple visits with different purposes and experiences impacted her.

I feel like, well, when we went to Fortin Pharmaceuticals this year? Yeah, it was this year and they were like we had- I remember we've been to Fortin, but not as how we went this year because that's where we just go and talk to somebody and they leave right away. This year was we went on we all went that was Charlton, Maloney and then everybody here. And we actually when we had a tour of Fortin and we went to see the building that they were making last year, and then we saw the process of it. But like, I feel like that was one of my best moments because day I networked so much with so many people because they were like showing us what they do there and what's their part. And then I feel like that's a good moment because it's showing me how to like be a bigger person, I
guess. Because- Because. That's something I need to learn when I get older. Yeah. Every time we were going somewhere, she went, Oh my God, this is my card. If you guys have any questions, you're interested. Yeah. So then Miss Charlton gave me a pack of her cards and then I wrote my email on the back and I was like, okay, this is Miss Charlton's. And then this is mine. I remember this one guy. They made him a vaccine and like he has the vaccine on him and his children and like that's cool because I'm like, I could do that one day, you know?

While Veronica sees herself as a successful medical researcher, she also is drawn to helping children, her reasons reminiscent of what she was missing in her own childhood:

I love them all my my siblings and I wouldn't want them to- get sick of somebody not to be able to do it, because I know like when you have a kid and you're a pediatrician, like the newborns, when they're sick, you have to, like, find what's wrong with them and stuff. So it's kind of like on the research side, but it still like is doing both what I want and what what I like and what I want to do because I want to work with kids. But like I also like the research, so I feel like I would be good there. I don't know because I'm passionate about what I want to do. And I love kids…I try my best, like some kids is sick I'll be like- ‘I'm not giving up’ because I know some doctors be like, oh well, there is no hope or something after they try like everything I would be like no, they're not dying on me.

Veronica aims to become an adult who will advocate for one of the most vulnerable populations, sick children. Her desire goes beyond simply advocating for them, but also to have the skills and role to take action herself. In many ways, Veronica’s future goals mirror her sense
of responsibility for her siblings and her conviction to make sure that other children have the voice and opportunities that did not come easily to her in her childhood.

In the above examples of students’ visualization of their futures, the stories above indicate that real-world learning, apprenticeship, and plenty of adult models are factors in their ability to see themselves clearly in careers that are meaningful and focused on helping and improving the world, both personally and to others. While they hold onto the mindset of ‘positivity’ and hope, they also present an awareness of the reality of the financial limitations of their class and home circumstances.

**Anticipating Financial Barriers**

In our initial chart paper brainstorm of things that power and disempower the students, I saw a sticky note with the word “rich” as something that provides people with power and voice. The participants in this study are either in poverty or middle class and understand the connection between money and options for their futures. As they outlined their plans for immediately after their high school graduation, finances were very much at the forefront of their minds.

Rose’s plans are to go to:

…community college first, save money, it’s a lot easier and then hopefully maybe I can transfer to a four year college. But if I don’t, I’ll finally take what I learned and try to get a job because I know that there are some jobs that will pay for you to go to college and get your next degree. Which would be great."

Rose outlines a sound plan that is realistic and attainable; yet at the same time, does not have the luxury of aiming directly for a four-year school as other students from more affluent homes.
While Doris is still exploring career options and is unsure of the path that she wants to take, she is clear on what kind of successful person she wants to be and how she will get there:

I want to go to college. I want to be a professional person. But I think I won't be able to go like right away because I have to work first to pay my college and all this stuff I think, yeah. So I'm thinking of, ok I'm a junior right now, next year, a senior. MAY-be if I don’t fail (chuckles). So maybe I want to do something like business or something like that. Yeah. But I'm also thinking about where I'm going to be working for the year after senior year. So during that year, I'm going to try to find school to keep going up [improving] my English. While I'm working. Yeah.

When I asked her what kind of job she wants to do in her gap year, she replied “I mean, just I just need a work. Anything that gives me money to do my college.” Though Doris does have dreams of being a successful professional, her prioritization of finding any kind of work with the purpose of saving money could potentially put her dreams on hold indefinitely.

Veronica has big ideas for her future but also considers the reality of financial constraints. She listens to her family who caution her of the student loan trap while also allowing herself some space to dream through the support of Miss Charlton, who is “like a second mom” to her and is encouraging her to join her on a tour of prestigious Tollins University, her alma mater. Veronica plans to “look for a lot of scholarships because clearly we don't have that much money to go.” She recounts her cousin’s experience at a local state university that helped him through financial hardship after a house fire. “So I have to look for places that I feel like I'd be good at and help me get where I want to, but like that will actually help me. Yeah.” Veronica also toys with the idea of studying abroad: “Like I want to see the world. I want to try something. I've always been here.”
While Veronica, Rose, and Doris display a sense of confidence around their plans to overcome obstacles, at times in our conversations, they revealed moments of feeling unsure about achieving their goals.

**Hopes and Fears**

In closing, two of the participants give us a glimpse into the window of their minds about their worries and dreams for their futures:

Doris:

I just hope that everything works well. I mean, my plan that I have. Yeah, of course. I really do want to go to college and that stuff. And I don't know if I'll be able to go.

Nick:

I have a lot of things on my mind now- would I- like trouble and have like- does good amount of money to like- I wish I could be more adult like more, you know older. If I could like have a career. That's going to come soon, hopefully. But you know, I would change that to be about more grown. To have this career so I can do what I want, you know?

Doris and Nick’s comments represent larger questions around the extent to which a strong high school experience can help traditionally marginalized students be successful, both personally and professionally, despite the weights of race, class, trauma, and other challenges. I will explore this question further in Chapter 5.

In Finding #4, Seeing Our Future: Visualizing Clear Pathways to Impact, I explained how the participants articulated clear ideas for their futures and were able to visualize themselves as successful and productive citizens due to their opportunities to learn through real-world
experiences, apprenticeship, and positive adult mentors and role models. I also shared that students identified financial barriers as the most significant roadblock to actualizing their futures as they visualize them now. Another pattern in imagining their futures was that of interest in careers that have a larger purpose and have the goal of bettering peoples’ lives in some manner.

4.4 Summary

Through the voices, reflections, and active participation of the students in this Photovoice project, as well as a constructivist grounded theory analysis of the data, I uncovered four major findings that describe the ways in which student agency is co-created in a transdisciplinary CTE program. These findings come along with insights on the institutional systems and structures that support and/or hinder the development of the students’ sense of agency.

Finding #1: Who We Are and What We Carry consists of the students’ interpretations of patterns of experiences that tie directly to empowerment and disempowerment in their childhood and lives outside of school. The themes of Emotional and Physical Proximity of Family Systems, Perspectives on Local Community Systems, and Roles and Responsibilities at home emerged as being important factors in what they carry with them in their lives. Events and experiences with family, home, and community contexts impact their readiness for learning and their mindset about themselves and the world around them.

Finding #2: How We Learn: Connectedness and Integration emerged from the participants’ voices about what works and what does not work for them in their learning. A thread that ties the themes of Connectedness and Integration together is the combined impact of connected and integrated experiences in their development of agency and sense of self in relation to the world and their futures.
Finding #3: *Our Mindset: Resilience and Positivity* concerns the students’ mindsets related to how they cope with trauma and how they perceive their sense of agency as marginalized youth. The theme *Coping with Trauma* represents the students’ perspectives on the effects of trauma on their lives. *Conquering Challenges* is centered on the students’ resilience alongside their conviction to keep moving ahead in life, despite challenges, and the belief that they have complete power and control of themselves and how they deal with things in their lives. I closed by sharing the students’ desires about what they want in their lives and how they want to be viewed by others.

Finding #4: *Seeing Our Future: Visualizing Clear Pathways to Impact and Success* is the fourth and final finding in this study. In *Visualizing a Successful Future*, I explained how the participants articulated clear ideas for their futures and were able to visualize themselves as successful and productive citizens. In *Anticipating Barriers*, I described how they also identified potential roadblocks to their success and outlined plans for breaking through or around them. I ended with *Hopes and Fears*, two participants’ brief summaries of their innermost thoughts on their futures.

In Chapter 5, I will discuss these findings along with an interpretive theoretical model that is grounded in the data. I will share the concepts of connectedness, integration, and mindset as key components of a theoretical model for the development of student agency in a transdisciplinary Career and Technical Education context. A secondary theory that I present is *collective bootstrapping*: a different take on the American individualist notion of ‘pulling yourself up by your bootstraps’ juxtaposed with critical perspectives that reject and speak out against the concept. I will then speak directly to teachers, school leaders, and policymakers to
propose recommendations and will suggest ideas for future research. I will end with a reflection on the strengths, limitations, and summary of this study.
CHAPTER 5: DISCUSSION AND GROUNDED THEORY

5.1 Introduction

In Chapter 4, I presented my findings that emerged from my analysis of the students’ reflections on their photographs, transcripts from semi-structured individual interviews, focus group sessions, and my own observations, using a constructivist grounded theory approach within the frame of a Photovoice project. In this chapter, I will discuss my findings and construct a theoretical model about the development of student agency in integrated academic/technical CTE that is grounded in that data. I will then share my recommendations to the CTE community, both on the policy and school levels, and will suggest directions for future research in the field.

The goal of this study was to uncover the ways in which student agency is co-created in a transdisciplinary CTE program, as well as to identify the institutional systems and structures that support or hinder the development of student agency. My purpose for engaging in this research was to give power to the voices of youth who are traditionally marginalized, to contribute to the sparse research base in CTE, and to inspire other educators who are on the ground in CTE schools to add to the literature as well.

I utilized Photovoice as an approach to engage in the research process alongside the students and encouraged the understandings to emerge through their experience. Eight Grade 11 students from a transdisciplinary, project-based STEAM innovation program within a regional Career and Technical high school participated in the entirety of the data collection process. Due to the sensitivity of some of the data that emerged in the semi-structured interviews, the students were not involved in the data analysis to protect their privacy. Since the students know each other relatively well and since the group of participants was small, it would be impossible to
completely blind the raw data. Nevertheless, the analysis was grounded in data that came entirely through their voices.

5.2 Interpretation of Findings

In Chapter 4, I presented themes that grew from the participants’ reflections on moments of empowerment and disempowerment in their lives, both in and out of school. I organized those themes into the following four findings:

- Finding #1: Who We Are and What We Carry
  - Emotional and Physical Proximity of Family Systems
  - Perspectives on Local Community Systems
  - Roles and Responsibilities

- Finding #2: How We Learn: Connectedness and Integration
  - Connectedness
  - Integration

- Finding #3: Our Mindset: Resilience and Positivity
  - Coping with Trauma
  - Conquering Challenges

- Finding #4: Seeing Our Future: Visualizing Clear Pathways to Impact and Success
  - Visualizing a Successful Future
  - Anticipating Barriers
  - Hopes and Fears

There are five cross-cutting ideas within the four findings that are consistent with the research that I reviewed in Chapter 3:
• Adolescent identity development
• Integration into discourse communities
• Embodied critical literacies
• Deeper learning
• Elevating CTE from a deficit model

In this section, I will discuss my interpretation of these themes and findings within the frames of the cross-cutting ideas from the literature. The fifth cross-cutting idea of *Elevating CTE from a deficit model* is a thread that connects the others. For the purposes of this discussion, I will weave it into my discussion of each of the first four cross-cutting ideas rather than presenting it in isolation.

**Adolescent Identity Development**

These findings are consistent with the literature on adolescent identity development in many ways. Lewis & del Valle (2009) describe identity as an ideological construct that is socially, culturally, institutionally, and politically situated rather than as purely individual phenomenon. In this study, the students continually make reference to the development of their identities within the constructs around them. Identity is fluid, multidimensional, and is critical in development of agency. This is especially important for adolescents in their development as stronger understandings of their multiple identities provide them with a clearer sense of purpose, self-confidence, self-efficacy, and the drive to make deliberate decisions in their lives and successfully take action.

As all the students in this study explain, family and community systems have a significant impact on their feelings of power and voice, and consequently, their identities. The
The concept of identity development is key in the adolescent years. It is a complicated stage in development as teenagers must contend with a range of identities as concurrently student and worker, considered both young and old (Christenbury et al., 2009b). For example, Veronica discussed her challenges with juggling adult responsibilities for her family, such as holding a job and taking care of siblings, with performing well in school. Rose shared stories about her carefree moments doing creative projects at home and the library alongside the adult responsibility of supporting her mother when she is ill. Thus, the physical and emotional proximity of the participants to their families were some of the most important elements of their experiences of empowerment of disempowerment that shaped them into who they are today and are deeply intertwined with the roles and responsibilities that they have at home. The participants represent a wide spectrum of roles, from profiles of students with strong, positive, and stable supports at home that allow them to focus on being students and children in the family system, to other profiles that act as providers of both physical and emotional support to their families as they are in an environment of instability, separation, neglect, and/or abuse. For example, Jack is living in a stable home with two parents and siblings and does not need to think about much beyond his schoolwork and when he will have time to play video games. In contrast, Doris lives without her parents, is grieving the loss of her mother while simultaneously struggling to thrive financially and learn a new language and culture.

The students view themselves as positive, contributing members of their community. They identify problems in Riverside and feel a sense of agency in being able to take collective action to improve those issues. For example, Nick feels that with the support of his peers, it is possible to advocate for clean energy solutions in Riverside. Nick and Doris also discuss the sense of belonging in their community from cultural, linguistic, and socioeconomic perspectives.
They represent most of the Riverside population in having a Latinx/American identity, and they feel like they are actively integrated in their community. Though they are aware of discrimination and injustice that occurs in the world, they view it as being distant from their own lives. This is consistent with Beckett and Morris’s (2001) study of identity construction in two settings, highlighting the link between identity, learning, and the body through the concept of ontological performance (as cited in Merriam et al., 2007). As cultural factors in the individual are continuously being deconstructed and reconstructed through their interactions with others, resulting in learning about their own identities, this parallels the students’ development of agency through those interactions.

The adolescents in this study also developed another part of their identity at school. They are integrated into the community of learners and feel a sense of belonging, voice and impact on their own learning and the world beyond Riverside Tech. For example, Veronica, Rose and Ren described the opportunity to co-design the question for the Trimester 2 transdisciplinary project as an empowering experience. Rose and Veronica used the words “family” “opportunity” “freedom” and “building” to describe the STEAM program to a group of adult visitors. Veronica elaborated on the concept of freedom to explain that it means the “freedom to be ourselves, try new things. We are not afraid to be judged.” The impact of the teachers was perhaps one of the most salient aspect of their identity construction within the learning community. For example, Becca attributed her growth in collaboration skills to her teachers’ efforts while Nick and Rose shared stories of their teachers’ work to create a STEAM “family.”

They expressed instances of unproductive struggle, which have a negative effect on agency. In Ren’s words, “the times when I don't feel like I have power is when I don't know what I'm doing.” At the same time, they expressed moments of failure, productive struggle, iteration,
and eventual success, such as Doris and Ren’s experiences with designing a prototype for an e-textile product in collaboration with the organization AETO. This contributes to the aspects of identity related to visualizing a successful future for themselves. For example, Ren can see himself as an engineer in the future based on experiences such as the AETO design challenge. Based on the students’ testimony, a range of elements from the Riverside Tech STEAM program emerged as contributing factors to the students’ sense of agency (See Figure 8).

Figure 8: Riverside Tech STEAM program elements that contribute to student agency

Transdisciplinary, project-based curriculum
Flexible scheduling of learning blocks
Arts integration
Exhibitions of student learning
CTE academic and technical integration
Learning beyond the school walls
Authentic audience and purpose for projects
Emphasis on collaborative learning
Teacher agency
Adult mentors and models
Integration into professional discourse communities
Strong community culture
Students and teachers co-create the learning
Work-based learning

Figure 8: Riverside Tech STEAM program elements that contribute to student agency
I will discuss these elements in more detail throughout the chapter and in the context of examples of student testimony.

**Integration Into Discourse Communities**

hooks (1994) argues that language is at the center of domination as a symbol of oppression and cultural imperialism. There has been a recent emphasis on the development of academic language in K-12 educational settings to help all students have access to the language of the dominant culture. However, academic language is not enough for students to succeed in professional discourse communities. They need to be well-versed in the language of specific disciplines and fields of work, in addition to more generic academic language, to gain direct access to the discourse communities. As Gee (2012) states, "Discourses are ways of behaving, interacting, valuing, thinking, believing, speaking, and often reading and writing, that are accepted as instantiations of particular identities by specific groups...they are socially situated identities."

In this particular CTE setting, the students have the opportunity to learn and practice that language with their teachers and professionals in the field. Their technical teachers have actually worked in the fields of biotechnology and engineering which provide students with the opportunity to have experts in the field teaching them every day at school. They apprentice within the languages of different disciplines in school within a transdisciplinary frame. In this transdisciplinary model, the students pursue a big question by exploring it through different disciplinary lenses and viewpoints. The students and teachers do this through partnering on projects with industry partners related to current topics of common interest and allowing students
to apprentice directly with the professionals, such as the University of Technology, AETO, Fortin Pharmaceuticals, and Venus Water Technologies. This collaboration is of mutual benefit, as the students develop their skills and agency while the professionals have the opportunity to mold future employees. For the students, to have real experts in the field listen to their ideas and value their contributions to the work have a positive impact on their sense of agency and self. Since the students have opportunities to gain entry to these discourse communities well before they graduate high school, they have the chance to try them out and emerge with a clear and strong vision of what their futures might look like.

Teenagers desire strong relationships with adults and these positive relationships are crucial to their identity development (Alvermann, 2009; Franzak, 2006; Intrator & Kunzman, 2009; Vygotsky, 1978). As all the students asserted, the relationships with many adults in their lives, including their teachers and professionals in the field, provide them with support, a sense of belonging, acceptance, and value. Strong adult models in their lives help them to stay on track and reinforce their positive mindsets. An example of this was shared by Veronica regarding learning the concept of networking. She not only learned by Miss Charlton’s explanation of the meaning of networking and its importance on the job, but she saw Miss Charlton model networking at various professional conferences, specifically in the language she used when interacting with people and her use of the business card as a tool of the trade.

**Embodied and Critical Literacies**

According to Hughes-Decatur (2011), transactional/constructivist theories describe reading as a meaning-making process between texts and readers, just as our bodies help us to make meaning about the world around us as we continuously read each other’s bodies to
construct meanings and understandings. Becca described her learning about the significance of control of our physical bodies as she processed through the illness and unexpected death of her father through the drawing of “yin and yang, of “good things” and “bad things…you know…they're, like fighting over-over, like even our own bodies like…you can think you're healthy, but you really sick and you don't even know about it. In a different context, student identity and integration into various professional discourse communities is another example of the application of theories of embodiment. Nick’s vignette about his trip to Fortin Pharmaceuticals describes how embodied learning occurs: “When we went in there I saw all the labs that I like to do and a lot of the machines that I want to work with. And I was so excited and I was like, oh, I want to do this. I want to do that…help people with medicine and people to succeed in life.” Following Nick’s example, physically being in the professional work spaces with the professionals themselves, the students develop their sense of agency through a few aspects of their experiences. They make meaning of the ‘texts’ around them, including the physical space, the tools within them, and the people who are a part of it. They begin to develop a clear picture of the discourse community and how it operates. As they read the body language of the professionals during their interactions, they develop a sense of belonging, voice, and value based on those positive connections and begin to feel integrated as a part of the discourse community. This union of the mind and body only adds to the student’s proficiency in the language of the discourse community. The example at the end of the previous section of Veronica’s learning about networking illustrates the gradual initiation into the discourse community.

As Woodcock (2010) asserts, the perpetuation of the mind/body dichotomy has a detrimental effect on individual agency, while in contrast, embodied literacy practices can foster
agency. In traditional CTE programs, students have the opportunity to blend their hands and minds with ongoing, hands-on projects that are connected to the real world. In the context of this particular study of a transdisciplinary learning model, there are additional instances of embodiment and integration of factors that are typically kept separate in CTE. Perhaps the most apparent is the integration of academic and technical disciplines that are commonly viewed as distinct bodies of learning by the CTE community. While there is a strand within the Career and Technical Education frameworks that provides connections between the career area and academic standards, this does not give students a sense of how these disciplines are deeply interconnected in the world. The message that alternating shop and academic weeks sends to students is that these are two very different, disconnected sets of knowledge. There are many natural and meaningful connections across the academic and technical disciplines that are lost opportunities due to this mindset and structure. Another false dichotomy that surfaces in CTE and in other educational settings is the separation of content-specific, technical skills from meta-skill sets. There is a debate that continuously arises in the CTE community about which skills to prioritize. This is unfortunate as it separates the physical performance of ‘hard skills’ from the ‘soft skills’ that in practice, actually need to coexist and work together for students to achieve success. Thus, they are both important and should be viewed as one concept with two components rather than as two separate concepts. In this study, the students’ agency developed in part because of the integration of academic and technical disciplines along with technical, academic, and meta-skill development. In Rose’s words, “…what I want to do in my future…is take biotech and engineering and put them together to make something new. And it can provide me opportunities to improve my life because it proves that what I'm trying to make a point about I can do.” Her discussion about her future career goals based on her embodied experiences at
home in nature with her grandmother as well as at school as she experiments with biotechnology and engineering provides a concrete example as to the ways in which the integration of the disciplines and different ways of knowing are embodied practices.

Another aspect of embodiment that appeared in this study is the ways in which students report that disembodied learning has a negative impact on their sense of power and voice, such as in Ren and Nick’s experiences in school before the Riverside STEAM program. This finding is consistent with the literature on embodied learning and critical literacies. As Nick shared his struggle with sitting through long classes, he illuminates the traditional, structured notions of teacher-student roles are perpetuated through expectations of silence, staying physically seated, and controlling emotions within this paradigm of the disciplined body (Foucault, 1977; Hughes-Decatur, 2011; E. Johnson & Vasudevan, 2012; Luke, 1992; Woodcock, 2010). Through this lens of disembodiment, dominant meaning systems are maintained by limiting the body’s space for expression and the opportunity to engage in meaning-making to empower and foster agency. In this study, students such as Rosa, Veronica, and Ren reported that they thrive when they have a voice in their learning, are encouraged to construct their own meanings, and have space to develop their individual and collective identities as part of a community of learners. As the students are all integrated into the same courses, regardless of learning differences, the traditionally marginalized struggling learners are given the opportunity to engage in deeper learning instead of being stuck in the cycle of ‘drill and kill,’ or as Freire (1970) coined the concept of the banking model of education (as cited in Freire, 1998; Gee, 2012; Giroux, 2011; hooks, 1994; Luke, 2012; Shor, 1992).

In addition, participants such as Rose were vocal about their disappointment in the lack of Arts integration into traditional schooling and the benefits that they enjoy from being in a
STEAM rather than a STEM program. A reduced emphasis on the arts and physical education disembodies learners and maintains the dominant discourse of power and oppression by removing opportunities to make meaning through the body (Hughes-Decatur, 2011). Within these tested subjects, the autonomous view of literacy perpetuates inequality through a narrow focus on the teaching, learning, and assessment of the dominant cultural ideology (Giroux, 2011). When students do not have enough space to explore possibilities and be creative, we see their engagement and motivation in learning decline as the learning becomes disconnected and less relevant to them. The Arts provide an opportunity for students to be empowered through embodied literacy and learning practices (Lenters & Smith, 2018; Lenters & Winters, 2013; Medina & Campano, 2006; M. Perry & Collier, 2018; Wager, Poey, & Berriz, 2017), such as in the example of Nick’s experience with using visual art to express his feelings about positivity and negativity.

Critical perspectives emerged throughout the findings in different ways. There were many instances in which the participants learned about equity issues within the exploration of larger societal problems. For example, in their clean energy project, the students spent time learning about the ways in which marginalized groups are negatively affected by issues related to clean energy at rates more impactful than the privileged. This is supported by Freire (1998), who states that education is crucial to a democratic society, and that it should be viewed as a type of intervention in the world to maintain democracy through cultivating citizenship and ongoing questioning, critique, and praxis to continuously ameliorate social conditions.

At the same time, those equity issues were not usually central in the students’ projects or connections to their sense of agency. In considering Janks’s (2000) four orientations to critical literacy: domination, the exploration of power, oppression, and inequality; access, providing a
range of texts that reproduce both dominant and non-dominant discourses; *diversity*, exposure to different ways of thinking and knowing; and, *design*, the use of multimodal texts or semiotic systems, the students did pinpoint examples of all four orientations in their learning. The data did not indicate that students view these orientations yet as integrated and connected to their own positionality.

The absence of connections between systems of inequity and themselves was interesting and unexpected. The participants were clear in sharing their awareness of inequities and oppression related to race, ethnicity, gender, immigration status, and poverty, to name a few, in history and in the world today. However, they did not articulate these issues as being a significant part of their own lives and community. At the same time, I was equally surprised when many of the participants stated that they would not change anything in their lives, and that their struggles have made them stronger. It is true that their resilience in the face of trauma and other challenges is quite remarkable, such as the abuse that Becca and Veronica suffered. They also carry a feeling of control over their lives that is slightly exaggerated from a critical standpoint. It is possible that they do not have a full sense of the ways in which aspects of their positionality put them at a disadvantage within larger societal systems because their community is relatively homogeneous with a strong Latinx-American culture. It is also possible that the individualist mindset has been ingrained in them as they and their families have been conditioned in the dominant ideology of the United States, along with the absence of critical views on the ways in which the current systems oppress them. Nevertheless, the data suggests that their resilience and mindsets have a positive impact on the development of their sense of agency. I will explore this further in Section 5.3, *Grounded Theory*, through my interpretive theory of *collective bootstrapping*. 
Deeper Learning

In this study, there are components of the students’ learning experiences that are consistent with the leading definitions of deeper learning. Mehta & Fine’s (2015) definition of deeper learning as “the intersection of the following three elements: mastery, identity, and creativity” (p. 15) are evident in the students’ successes in mastering both content, skills, and applying them in meaningful projects; their developing identities as valuable members of various discourse communities, including school-based and real-world based; and their work that contains elements of creativity in an artistic sense as well as in creative problem solving, such as in the examples in the previous section of Rose and Ren’s AETO projects. “Deeper learning” (Bellanca, 2015; Dintersmith, 2018; Mehta & Fine, 2019) is a popular buzzword in the realm of public education today. The Hewlett Foundation’s list of the “six key attributes of deeper learning”: “master of core academic content”; critical thinking and problem solving; collaboration; communication in writing and speaking; self-directed learning; and academic mindset” (Belanca, 2015, pp. 3-5) are visible throughout the students’ learning artifacts and reflections on their learning. The additional “transfer element” (p. 70) surfaces as students transfer their skills and knowledge among different applications across the disciplines. Ted Dintersmith’s (2015) “PEAK principles”—“purpose, essentials, agency, and knowledge.” (p. xx) are evident in all four of the findings.

While these definitions of deeper learning capture many elements of impactful learning, they are limited in that they are not situated within the larger goal of student agency. In the next section, I present my interpretive theory of the development of student agency and the factors that contribute to it. This theory can help to clarify the limitations of the above definitions of
deeper learning and provide a clear connection between elements of deeper learning and the development of agency.

5.3 Grounded Theory

After a thorough analysis and interpretation of the data in this study, I constructed the following interpretive theory grounded in that data: The development of student agency in integrated academic/technical Career and Technical Education occurs through ongoing, meaningful experiences and relationships that are connected, integrated, and impact the students’ sense of self in relation to the world. The mindset of *collective bootstrapping* is a secondary theory that supports the students’ perseverance and resilience in the face of challenges, both in and out of school, and contributes to their drive to carry themselves and others toward the dream of success in their lives.

See a visual representation of this theoretical model below. Next, I will discuss the components of the model in more detail through discussion of the agency development of a learner composite based on the participants in this study. After I describe the example, I will share the various theories upon which I have drawn in construction of this model.
Consider the visual above as a representation of the development of an individual adolescent’s sense of agency. The arrows represent experiences in the teen’s life that inform her sense of self in relation to the world. The more experiences she has that contain elements of connectedness and integration, the more her mindset will strengthen, and she will increasingly feel the potential of her impact on the world around her. As the experiences grow in number, range, and quality of connected and integrated experiences, the lines that connect the arrows
thicken, signifying an increase of the strength of her mindset and impact. At the same time, her sense of the possibilities of her current and future impact on the world become clearer, more specific. Seeing the future then contributes further to her sense of agency, prompting her to engage in more connected and integrated experiences, thus continuing through the cycle shown in the visual above.

The teen’s childhood, past and current experiences at home and in the community are unique to her. She may have had limited experiences that contain elements of connectedness and integration and the lines attached to the arrows could be very thin and faint. She may have many experiences that contain elements of distance, disconnectedness, and negative impact that cause the lines to be broken and scattered. Her mindset of *collective bootstrapping* along with connected and integrated experiences at school help her to strengthen those lines and her clarity about herself.

The element of connectedness is about the web of systems that an adolescent can encounter. This includes connections to bodies of knowledge, people, places, and phenomena in the world. By engaging in a wide variety of experiences within these systems, the teen can begin to visualize the breadth of the systems that exist in the world and understand the ways in which they connect and coexist.

The element of integration is about the degree to which an adolescent can become an active and impactful part of connected systems around her. This begins with integration into various discourse communities in and out of school, building relationships with adults within them, and having a voice and impact on issues that arise within the communities. In school, she continuously develops strong, discipline-specific academic and technical skills alongside
employability and meta-skills, applying them in different projects that connect to real issues in the world. She experiences failure, iteration, and productive struggle that eventually result in success. By becoming a part of different discourse communities, the adolescent feels a sense of belonging and value, and can see herself having increasingly positive impacts within discourse communities of her choice as an adult.

The element of mindset, in the context of my study, relates to my secondary interpretive theory of collective bootstrapping. This theory builds upon the work of Carol Dweck (2016) with the concept of growth mindset and Angela Duckworth’s (2016) work with the notion of grit. I will expand on this theory by extending my discussion of a composite learner that represents the students who participated in this research project.

The marginalized adolescent, who is even further marginalized by race, ethnicity, socioeconomic status, language, and other factors, can emerge with a strong sense of resilience and belief that hard work leads to success. She has experienced that success on multiple occasions, as she grows stronger with adversity and is able to do well at school while at the same time providing for her family, both emotionally and physically. She hears adults and peers in her community say that she is responsible for her own choices, and the only person who can let her down is herself. Armed with this mindset, she embraces the individualist ideal of ‘pulling yourself up by your bootstraps’ amid a time when political and socioeconomic views and policies in society have become consumed by neoliberal powers.

Her bootstraps are different than other teens who carry more privilege in their lives, with monetary and human supports that help them up when they slip and keep them rising when things become difficult. The collective bootstrapper develop straps that are thicker, longer, and
many. They become thicker as she rises after struggles in her life, getting stronger with each experience. She cannot pull herself up entirely on her own, but she has a safety net of a community of adults and peers in her various discourse communities that provide a cushion when she falls and gives her the tools and supports to steadily pull herself higher and higher. She does not only use them to carry herself but ensures that she does not leave her family members, her peers, and her community. While she is sad and frustrated at times, she feels a sense of responsibility and pride as she continues to achieve and support the people she loves.

This theory of collective bootstrapping synthesizes elements of conflicting views on how to develop human agency and success in life. As I discussed in Chapter 2, the modern neoliberal view helps in maintaining the American ideal of individualism that is part of the dominant culture. Duckworth (2016) posits that high levels of “a combination of passion and perseverance,” or ‘grit,’ are the ingredients that lead to the development of high success and accomplishment (p. 8). The author explains that people who are “highly successful” have a unique degree of resilience, work ethic, and goals that are clear and deeply embedded in them (p. 8). Jal Mehta (2015), a prominent voice today in the realm of deeper learning and school redesign, states that one of the biggest criticisms of Duckworth’s (2016) concept of ‘grit’ is that it can support the deficit view of disadvantaged learners, casting blame on youth who are marginalized based on race and socioeconomic status as simply not being “gritty” enough. However, while Mehta (2015) acknowledges this criticism, he explains that he also understands why “schools and parents would want to focus on elements that they can control.” Instead, his main criticism is that the concept of ‘grit’ ignores what research tells us about the development of motivation, and that over time it is not as much about getting better at perseverance as it is about engaging in work that is interesting and has purpose. Thus, he asserts that schools should
not overfocus on the building of student stamina at the expense of students’ development of “purpose and passion.” In an article in The New Yorker, Denby (2016) raises an additional concern about ‘grit’ in that considerations of affective learning, including caring and supporting others, are virtually absent from the discussion. Essentially, the concept of grit overemphasized in schools could support the disembodiment of learners and the neoliberal push for more standardization and testing and therefore perpetuating the individualist notion of ‘bootstrapping.’

In contrast, critical views of ‘bootstrapping’ maintain that marginalized groups cannot pull themselves up from their bootstraps because of the systems and structures that oppress them. In other words, no matter how hard they work, how persistent they are in their efforts, the system will continue to push them down. As the spectrum of prominent political orientations grow more in the United States, and as the country becomes more divided, questions of equity and policies that support programs and services to help bridge the inequity contrasted with calls for individualist ‘bootstrapping’ continue to be topics of debate. For example, U.S. Representative and democratic socialist Alexandra Ocasio-Cortez, recently sparked a ‘Twitter war’ to criticize the ways in which the idea of ‘bootstrapping’ is permeating federal policy, retorting to one of her critics in a February 6, 2020 Twitter post that:

I see that the right is worked up that we pointed out the myth of bootstrapping when 60% of the wealth in this country is *inherited.* But hey, if you think I’m hopelessly dumb, try listening to MLK talk about “bootstrapping” & the racial wealth gap, too (as cited in Gage, 2020)

As policymakers argue over the extent to which disadvantaged populations should be provided with supports from the government or if they can just be ‘gritty’ and pull themselves up
on their own, the youth of this nation continue to be funneled through schooling that is still operating from an outdated foundation and philosophy of learning.

I am deeply critical of neoliberalism and the individualist notion of ‘bootstrapping’ and believe strongly that the systems absolutely need to change at all levels of society and specifically applied to K-12 schooling. At the same time, I make space to provide an alternative view that acknowledges the current reality of the oppressive systems at play and the ways in which schools can create an environment that allows for collective bootstrapping, with the individual student at the center of the efforts surrounded by adults and peers, such as teachers and professionals, across different discourse communities that work together to co-create the development of their sense of agency. As the marginalized adolescent embraces the notion of individualism, it casts her in a different light of resilience and learned industriousness rather as a victim who needs to be coddled and held up by others. As she begins to thrive, she also brings along others in her family, circle of friends, and local community to support them as well. Although this occurs within the broken systems that she is stuck in, it should happen in parallel to the efforts of breaking down and reconstructing the dysfunctional institutional systems and structures that oppress her.

The element of impact of learning experiences occurs because of the coexistence of connectedness, integration, and collective bootstrapping mindset in her home and school life. More specifically, the sense of impact occurs in conjunction with the adolescent’s sense of self in the context of the world, including at the levels of home, local, and global communities. When she continuously experiences success in applying her skills in challenging, authentic contexts, she feels a stronger sense of integration within that discourse community and can visualize herself as an increasingly integral part of that community.
This model of student agency development builds upon work mainly from the fields of education and psychology. More specifically, Ryan & Deci’s (2000) work on intrinsic motivation and specifically their *self-determination theory* that posits that the elements of autonomy, or identity development; competence, or experiences in responsibility and ownership of work; and relatedness, or collaboration with others, are key to the development of self-motivation. Similarly, I draw upon Pink’s (2009) framework of intrinsic motivation that includes the components of autonomy, mastery, and purpose. More recent work in the area of *deeper learning* informed this theory, as the authors include the aspect of motivation in learning along with other considerations that are situated within the demands of the 21st (Bellanca, 2015; Dintersmith, 2018; Mehta & Fine, 2019).

This theory also builds upon the work of Carol Dweck (2016) as her concept of growth mindset in teachers and students is part of the component of mindset and *collective bootstrapping* that I discuss more broadly. Angela Duckworth’s (2016) work with the notion of grit is an important informing factor in the idea of collective bootstrapping, which I will explain later in this chapter. I utilize theories of embodiment in learning (Foucault, 1977; Luke, 1992) as well as understandings about discourse communities within the Disciplines (Gee, 2012) and transdisciplinarity as a way of problem-solving and creating new knowledge (Minnich, 2005) within my theory. Finally, I bring a critical lens to this theory in the spirit of Paulo Friere’s (1970) work in the realm of critical pedagogy.

It is important to mention a similar theory and the ways in which the two differ from each other. The framework of Connected Learning (Connected Learning Alliance, 2020) presents authentic, student-centered learning as consisting of three components: interests, relationships, and opportunities. Connected Learning began through support from the 2005 Digital Media and
While Connected Learning’s elements of interests, relationships, and opportunities contain substantial overlap with the components of connectedness, integration, and mindset in the theory of student agency development that I present in this chapter, there are notable differences between the two. First, the emphasis on connectedness through technology in Connected Learning is not as prominent in this grounded theory of student agency development as the participants consistently referred to hands-on, in-person authentic learning as being most impactful for them. Also, the Framework of Connected Learning does not explicitly put student agency as a central goal. It also focuses more on self-directed learning than more deliberately coordinated transdisciplinary projects.

While the theoretical model of student agency development and collective bootstrapping happened to surface in an integrated academic/technical Career and Technical Education setting, it occurred despite the systems and structures that are typical in schools. Current typical CTE programming contains great strengths that contribute to student agency, but there are regulations, policies, structures, and expectations that limit the space that CTE educators can operate in. It is imperative that policymakers and educators on the district and school levels examine their policies and structures to make more room for the development of student agency.

5.4 Implications and Recommendations

In this section, I will provide my recommendations by speaking directly to two audiences: Career and Technical Education policymakers and educators on the school level.
Recommendations: Career and Technical Education Policy

Career and Technical Education policy, both at the federal and state level, has been improved over the years to provide more access, equity, quality education, and more pathways for future careers. At the same time, there is still a need for further development of Career and Technical Education.

Recommendations: CTE Policymakers

1. *Shift toward a more human-centered view of workforce development in CTE.* In today’s political climate, I worry that the pendulum in CTE may soon be swinging toward a narrower, school-to-work pipeline and away from a more human-centered view of workforce development. I very much support the development of multiple pathways for students to pursue upon graduation, ranging from going straight to the workforce, to further technical training, and/or college. These are all strong options, and the choice should be driven by the interest and desire of the individual rather than the immediate needs of the economy and workforce. Funneling graduates into specific jobs to fill gaps in the workforce might not be in their best interest in the long-term. There are current CTE programs that are in industries that are booming and are preparing students for entry-level jobs that currently need trained workers and that currently have a strong trajectory of individual growth and career advancement over time. However, some of these jobs will become obsolete due to technological advances within the lifetime of current CTE students. I urge policymakers to collaborate with researchers and educators to determine solutions to this problem.

2. *Move away from rigid silos.* In CTE, silos are more rampant than in comprehensive high schools. Not only are the disciplines taught in isolation, but there is a further false
dichotomy that occurs between the academic and technical disciplines. While there continue to be recommendations for academic and technical integration at the federal policy level, there is not enough support with strong, authentic examples of how integration can occur and there is not enough emphasis made on integration. Consider offering authentic examples of integration along with incentives for schools to prioritize integration. Also, support policymakers at the State level in developing and supporting CTE programs that allow for agility within a career area and related industries. There are multiple entry points for students to break into these careers. Narrow career areas centered on a narrow job or set of related jobs with the idea of students working their way up is a shortsighted way of doing business and perpetuate the marginalization of specific groups of people. The battles between ‘college’ and ‘career,’ viewing programs as ‘too academic’ or ‘not academic enough,’ focus on ‘hard skills’ vs ‘soft skills’ are just silly. Let’s stop spending time on these petty squabbles, accept that ‘it is all important’ and focus on the quality of the programming for all students.

3. **Expand the concept of work-based learning.** Cooperative Education (co-op) is one of the crown jewels of CTE. Adolescents, who are still in high school and still minors, can gain employment within their career area and gain credits and pay during the school day. My advice is to put metrics in place to encourage CTE schools to provide students with co-ops that are of high quality. While many are currently of high quality, there are also some that are not. There are times in which students are increasing their development of technical and employability skills in school, and then end up in a co-op doing repetitive, basic tasks. While the current metrics are focused on number of placements in the career area, the emphasis in the eyes of CTE schools is placed on
quantity over quality. Put new expectations in place to promote the number of quality co-op placements for students. Since they potentially spend 50% of their time in co-op once they become eligible halfway through Grade 11, it is imperative that we ensure that their experiences are of strong and high quality. Also, there are not any incentives for schools to engage in other work-based learning experiences for students. Expand the opportunities for students to participate in a range of frequent visits to industry partners, engage in real projects with those organizations, present their work and gain feedback to professionals in the field. While there is space to offer these kinds of work-based learning opportunities for students, there is so much emphasis on preparing students for co-op that this sometimes happens at the expense of other experiences that could occur alongside co-op preparation in the earlier grades.

4. *Leave more space for innovation within CTE.* For CTE schools to develop strong examples of academic and technical integration, as well as expanded work-based learning, they need space and encouragement to do so. It takes courage to do things differently and face the scrutiny of others who might be resistant to new ideas. Support schools in trying new things.

**Recommendations: School- and District-Based Educators**

Regardless of the state of CTE policy, there are a range of recommendations that emerge from students’ testimony that can be implemented immediately.

1. *Get out of the building.* Teachers, look for opportunities in your local community to have students connect to various discourse communities and interact with professionals across different fields and contexts. In my experience, businesses and community organizations welcome student contact and are great thought partners in collaborations, from student
projects to student work-based learning experiences. Usually, there is no cost associated with these off-site visits other than transportation. Get to know options for public transportation in your school community and teach students to use public transit as part of this experience. Many times, schools opt to have external partners visit the school as guest speakers because it is much easier logistically. It is worth taking the extra effort to take the students on-site. It is motivating and helps them visualize the professional world and themselves as a part of it. School leaders, remove any barriers for teachers to make it easier for them to make these arrangements. Streamline your field trip forms if you need to and recognize teachers who make this extra effort. This recommendation supports student learning through developing broader understandings of the world beyond the school walls (Finding #2) and helps them to visualize clear pathways to their future careers (Finding #4).

2. *Flip the script.* By flip the script, I am not referring to flipped classrooms in which the students learn new content after-school and online and apply it in school. Instead, I am suggesting a shift away from traditional structures for teaching and learning, from curriculum development on the unit level to implementation on the lesson level. Instead of acting as a teacher who gives knowledge to students, flip the script and act as a facilitator and guide with students creating new knowledge. Instead of always following the lesson sequence of activator, mini-lesson, guided practice, independent or group application in an assignment or project, and closure, flip the script and start with exploration of a question through the project and provide direct instruction on the skills needed as they come up in the students’ work. This is a flexible yet structured process that allows for the instruction to be naturally differentiated and ensures that certain skills
will need to be introduced during the process for students to be able to be successful in their projects. When you flip the script, students tend to be more engaged in the work and more motivated to learn new skills, as evidenced in Finding #4. School leaders, be patient with teachers as they try to flip the script. It takes time to learn to do it effectively. Also, it can look very messy at times! Provide teachers with professional learning opportunities to sharpen their skills in flipping the script.

3. ‘Why should I care?’ Teachers, whenever you plan any type of instruction, put yourself in the shoes of the students and ask yourself- ‘Why should I care?’ about this content, lesson, or assignment. Your answer should be easy to think of and should be something meaningful and relevant. If your answer is hard to determine or associated only with getting a good grade or mastering certain content, push yourself to look back at your plans and make adjustments. It might be as simple as adding stronger essential questions or reflection questions. It might be as easy as adjusting some of the tasks associated with the assignment. It could also require a more in-depth revision of the lesson- but it is worth it. School leaders, when supporting teachers in their instruction, use the ‘Why should I care?’ question to help teachers reflect on their lessons and make them even more impactful. Often times, during classroom observations, we will ask students ‘Why are you learning this?’ which could possibly get to the same result but could also lead to more surface-level thinking about their learning. The word care helps students, teachers, and school leaders remember to prioritize meaningful connections between learning, the students, and the world around them (Findings #1, 2).

4. ‘Let’s try it.’ Teachers, school leaders, let’s say this often. When you allow space for students to share their ideas for their learning, you will be blown away by the insightful
and novel ideas that come directly from the students. They might have an idea as to how
to build or create something in their project, or ideas for improving classroom structures
and routines, or ideas to improve the school and beyond. Time is our biggest enemy in
public high schools, as the weight of requirements such as standardized testing and
coverage of standards and material keep us from branching out during the 183 short days
that we have with our students each year. School leaders feel the same pressures and
might be leery of taking these kinds of risks, but the opportunities for students to
develop a stronger sense of integration into their learning community outweigh the
negatives (Finding #2). I urge you to give it a try anyway, for the students’ sake.

5. *Make students co-designers of their learning.* This does involve letting go some control,
which can be hard for us as educators. However, inviting students to co-construct their
learning experiences alongside you helps to better understand them as learners, provides
them with a sense of integration into the classroom community (Finding #2), creates a
sense of ownership, and ultimately results in even more meaningful learning and
motivated learners. This is not a free-for all and does not mean that your expertise as an
educator is not important! Co-design of learning with students should be intentionally
planned and executed.

6. *Build strong relationships with your students.* Teachers sometimes try to build
relationships with students by learning about where they are from, what languages they
speak, and what customs and traditions they participate in. Extend past elements of
surface-level culture and really get to know them in a genuine, deep way. Provide space
for their voices and get to know them as learners and as human beings. It will go a long
way. (Findings #1, 2, 4)
7. *On wanting to be successful.* All human beings want to be successful in their lives. That includes our students, no matter how they might be presenting in class and how challenging their behaviors might be. It can be easy to fall into the trap of thinking that the students are making a choice to not do well and that they do not care about having successful futures, especially when the day-to-day struggles wear us down. I can assure you that all your students have hopes and dreams. They all want to have happy lives, both now and in their futures. They just might not think they are capable of achieving that kind of life. It is our job to give them the tools that they need to develop a sense of agency and see a path to a successful future. As educators, we have a duty to never give up on any student and to continue to work on finding new ways to reach them. If you do not believe in them, how can they believe in themselves? (Findings #1 and #4).

8. *‘Oh yes they can.’* I continue to be amazed at the resilience of our students and their accomplishments despite barriers. Students in CTE settings absolutely can achieve at high levels, yet we still are faced with educator mindsets that say CTE students, urban students, poor students, SWD, and black and brown students should carry a revised, limited expectation of where they can and should go in their lives. Keep the expectations high, give students the tools they need, and join them in dreaming big (Finding #3).

9. *‘Oh yes we can.’* As an educator, it is difficult to foster student agency if you do not have a strong sense of agency yourself. You are not a robot and corporate curriculum writers and canned program developers do not know how your students learn in the way that you do. School leaders, believe in your teachers to be able to make strong decisions in their instruction and to develop interesting, impactful curriculum. However, no teacher ever reaches perfection. Thus, they will have varying strengths and areas of need to continue
to develop as educators. Give time for provide incentives for teachers to engage in continuous meaningful professional learning. Develop a culture of lifelong learning and collaboration to create a community of agentic teachers (Findings #1 and 2).

10. **Make teacher collaboration a priority.** Students benefit significantly when their learning is connected across disciplines and integrated within transdisciplinary projects. Current school structures do not allow for teacher collaboration to happen easily. Make collaboration a priority. Think creatively about scheduling and involve your teachers in identifying potential ways to make time for meaningful and consistent collaboration to occur. The STEAM program is just one example of this type of learning but is by no means superior to others. The key is in considering these best practices, extracting those that are most relevant for you in your setting, and adjusting in your own context. It takes courageous leadership and teachers to make real change in our schools. Take the leap and give it a try (Finding #2).

11. **Make public sharing of learning a non-negotiable in your practice.** Exhibitions of student learning and other ways of publishing work with authentic audience and purpose will help to transform your classroom. You will find that students are more motivated and focused on their learning in the long-run (emphasis on long-run, as it may take some time). Those moments of celebration of success will help students feel more confident and agentic- and do not be surprised if you bump into a student in the grocery store 10 years from now and they reminisce on those memorable moments (Findings # 2, 3, 4).

12. **Be open to shifting your mindset.** The recommendations listed require a shift in mindset to some extent as they may conflict with accountability and compliance policies, content in educator preparation programs, and our own experiences as learners. Be ready for
resistance from external factors and remember that these shifts will better align your work with evidence-based practices and will ultimately benefit your students (Findings #1-4).

5.5 Suggestions for Future Research

Throughout the research process, there were many moments in which many additional research questions and directions for further exploration surfaced in my mind.

Some of my ideas for future research are as follows:

1. **Explore patterns of teacher agency in the STEAM program at Riverside Tech.** As teacher agency is imperative for fostering student agency, a study focused on the teachers at Riverside Tech could illuminate factors that contribute to, and detract from, teacher agency in a transdisciplinary setting.

2. **Extend this study as a longitudinal effort, following the participants after high school.** Students in this study have a clear vision of themselves in a successful future. A longitudinal effort would show the ways in which they work toward those futures without the support of the Riverside Tech community.

3. **Study the larger systemic forces that support and act as barriers to the development and sustainability of innovative schools.** This could include the ways in which institutional politics and agendas affect the establishment and growth of programs that are different from others, theories of change and the phenomenon of resistance to change, and financial considerations as some examples of these forces.

4. **Investigate the ways in which academic and technical integration is implemented in CTE settings on a national level.** The research on this is limited, and the sparse research
that exists highlights examples of academic and technical integration that tend to be surface-level and disconnected to the real-world. The purpose of this would be to explore more deeply and broadly in the United States to find examples of bright spots.

5. **Construct new understandings of the continuum of ways in which transdisciplinary projects can be organized and implemented and investigate their strengths and challenges.** The purpose of this would be to provide school-based educators with professional learning on the topic and practical, concrete strategies to integrate them in their own contexts.

6. **Explore the impact of teacher preparation programs in CTE.** The sparse research on CTE teacher preparation and my own anecdotal observations indicate that there is a need for research on this topic and evidence-based recommendations for improvement.

7. **Explore the concept of collective bootstrapping within other urban communities and contrast with similarities and differences in suburban affluent communities.** There is a need to document this phenomenon more broadly to investigate it more deeply. Deeper understandings of collective bootstrapping could inform educational practice as well as potentially educational policy.

8. **Explore patterns of student agency in other innovative schools.** This would be an extension of Mehta and Fine and Dintersmith’s work.

9. **Profile/categorize the continuum of learning experiences that occur beyond classroom walls, learn about their impact, and explore how the most effective ways to implement them.** The purpose of this would be to provide school-based educators with professional learning on the topic and practical, concrete strategies to integrate them in their own contexts.
10. Investigate the concepts of connectedness, integration, and impact of these experiences as factors for the development of student agency in other transdisciplinary learning settings. It would be interesting to explore the ways in which these concepts emerge in different settings to gain a deeper understanding of the contextual forces that contribute to agency development.

5.6 Strengths and Limitations

A strength of this study is that the participants are a representative cross-section of the STEAM Grade 11 population in terms of gender, socio-economic status, race, ethnicity, language, place of birth, and special population status such as Students with Disabilities and Limited English Proficiency. Also, my analysis was based on data that came directly from the students, thus minimizing the chance that my own biases would affect the choice of data for analysis. As a Grounded Theory study, the data analysis process was methodical and rigorous. As a Photovoice study, the voices of a marginalized population of youth were captured and contributed to the literature base.

My multiple roles as participant-observer in this study are both strengths and limitations. Since I already had relationships developed with the students and know the program intimately, I was able to gain deeper insights into the experiences of the students. It did not take long for them to speak openly with me about sensitive topics and the context around them were familiar to me. At the same time, my proximity to the setting and participants, personal and professional investment in the program could have affected my perspective and interpretation of the data. Also, my positional power as an adult and authority figure in the school could have affected students’ interactions with me and candor in our discussions. For example, they may have held
back on sharing pieces of information that they thought could cast their teachers, the program, or themselves in a negative light due to perceived negative repercussions and/or to please me.

One limitation in this study is the voluntary nature of participation as students who are more disengaged as learners may not have volunteered. Another limitation is the time commitment for students. Since we met mostly during their Advisory block during the school day, students who use that time for other purposes and did not want to make changes to that may not have volunteered. Also, since this is my place of work and my role is as supervisor of the STEAM teachers, my time and access were limited for observing students for research purposes.

5.7 Summary

After a thorough analysis and interpretation of the data in this study in this Photovoice study, I constructed the following interpretive theory grounded in that data: The development of student agency in integrated academic/technical Career and Technical Education occurs through ongoing, meaningful experiences and relationships that are connected, integrated, and impact the students’ sense of self in relation to the world.

The mindset of collective bootstrapping is a secondary theory that supports the students’ perseverance and resilience in the face of challenges, both in and out of school, and contributes to their drive to carry themselves and others toward the dream of success in their lives. In contrast with the American individualist ideal of ‘pulling yourself up by your bootstraps,’ and the critical viewpoint that it is impossible for marginalized populations to do so due to oppressive overarching systems and structures, the collective bootstrapping mindset is one that describes the remarkable resilience and drive that empower marginalized adolescents to pull themselves and others up ‘by their bootstraps’.
In this study, I utilized Photovoice as an approach to engage in the research process alongside the students and encouraged the understandings to emerge through their experience. Eight Grade 11 students from a transdisciplinary, project-based STEAM program within a regional Career and Technical high school participated in the entirety of the data collection process. I then used a constructivist grounded theory approach to analyze the data and develop an interpretive theory that is grounded in that data. My purpose for engaging in this research was to give power to the voices of youth who are traditionally marginalized, to contribute to the sparse research base in CTE, and to inspire other educators who are on the ground in CTE schools to add to the literature as well.

It is my hope that the voices of these adolescents can carry the message of their strength, resilience, and the elements that contribute to their development of agency to educators who touch the lives of other marginalized youth.
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Appendix A: Informed Consent Form

Dear Parents/Guardians,

I hope you had a nice summer! In addition to overseeing the STEAM [Title], I am also a student in a doctoral program and would like to ask your permission for your son/daughter to participate in a research study that I will be doing this fall. This is completely voluntary and will not affect your child’s participation in the STEAM [Title] in any way if you choose for your child not to participate in the study. This form contains information about this study that you will need to know. Please read it carefully and sign on the last page if you give permission for your son/daughter to participate. If you have any questions at all, please feel free to contact me at [Name] or [Contact Information].

Sincerely,

Panagiota Athinelis

Title: Student Agency in Integrated Academic/Technical Career and Technical Education: A Photovoice Project

Dear STEAM [Title] Grade 11 Students:

Description and Purpose: I am asking you to participate in this research study as a volunteer. The purpose of this research is to find out what helps, and what stands in the way of, students in the STEAM [Title] becoming strategic, independent, and knowledgeable with the power to set goals, make decisions, and take action on those goals and decisions. The research approach that I’m using is called “community-based participatory action research,” meaning that you will help me to collect data, analyze it, and decide together on ways we want to present it. I hope that you will also benefit from practicing your research skills, too!

Procedures: Your participation in the study will include interviews every other week and/or focus group sessions with other student participants and me. These sessions will be held after school for forty-five minutes to one hour each time we meet. In between each meeting, you will be gathering information through a process called Photovoice. What that means is that all participants (including you!) will use cameras to take pictures and videos, as well as collect other artifacts that you find to be important data to bring back to the focus group. You will continuously gather this data on a daily basis throughout the course of this study, from September-December.

How will you know what data to collect? You will collect photos, videos, and artifacts of anything in your life that you feel contributes to and/or stands in the way of the development of your sense of agency. What’s agency? We will work on refining this definition together- but for now, my definition of it is a way to describe a person who is strategic, independent, and knowledgeable with the power to set goals, make decisions, and take action on those goals and decisions. There is no right or wrong answer here about what you decide to collect as data- it really depends on what you feel is important in connection to your own sense of agency.
When we have meetings, we may record using audio and/or video. These audio and/or video recordings will be kept confidential, and we will use them only to help us remember details when we analyze the information and write about it. You can also participate in the data analysis by reviewing the data with me, finding patterns, and discussing. You can also participate in the publication process, meaning to help decide where and how we want to share the results from this study.

**Participation Information and Confidentiality:**

Participation in research is voluntary, which means it is up to you and your family to decide if you will participate. You have the right to refuse to be in this study. If you decide to be in the study and change your mind, you have the right to withdraw at any time. You may skip any part of this study. Whatever you decide, you will not lose any benefits to which you are otherwise entitled.

You have the right to remain anonymous. If you elect to remain anonymous, I will keep your records private and confidential to the extent allowed by law. I will use numerical identifiers rather than your name on study records. Your name and other facts that might identify you will not appear when we present this study or publish its results. If for some reason you do not wish to remain anonymous, you may specifically authorize the use of material that would identify you as a subject in the experiment.

I will give you a copy of this consent form to keep.

**Signatures:**

Investigator's Signature:

_________________________  ___________________________  ___________________________

Date  Investigator's Signature  Print Name

**If you would like to participate in this study, sign here:**

The nature and purpose of this research have been satisfactorily explained to me and I agree to become a participant in the study as described above. I understand that I am free to discontinue participation at any time if I so choose, and that the investigator will gladly answer any questions that arise during the course of the research.

_________________________  ___________________________  ___________________________

Date  Subject’s Signature  Print Name

**If you are under 18 and would like to participate in this study, your parent/guardian should also sign here:**
There is a Standing Committee for Human Subjects in Research at Lesley University to which complaints or problems concerning any research project may, and should, be reported if they arise. Contact the Committee Chairpersons at irb@lesley.edu

Other Contact Information at Lesley University:

Principal Faculty Investigator: Mary Ann Cappiello, Associate Professor, Division of Language & Literacy, Graduate School of Education (mcappiel@lesley.edu)

Lead Researcher: Panagiota Athinelis, Student, Individually Designed Ph.D. in Educational Studies (pathine2@lesley.edu)
Appendix B: Participant Individual Interview Questions

Talk about what kinds of things in your life give you power and voice.
Talk about what kinds of things in your life take away your power and voice.
(prompt for in school/out of school as needed)
What kinds of things are hard for you? Why?
Tell me about your family.
What has been your most exciting moment(s) in the STEAM program?
What has been the most important moment(s) in terms of your learning?
What has been your lowest moment(s) in the STEAM program?
When has learning been the hardest?
What do you think adults think of you?
What are your future plans?
How do you feel about the community you live in?
What would you change in your life if you could?
What would you change in the STEAM program?
Anything else that you would like to tell me about in terms of your feelings of empowerment and disempowerment in your life?