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CAREER AND TECHNICAL EDUCATION AS AFFINITY SPACES: PERSPECTIVES FROM STUDENTS WITH AND WITHOUT SPECIAL NEEDS

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CAREER AND TECHNICAL EDUCATION AS AFFINITY SPACES:
PERSPECTIVES FROM STUDENTS WITH AND WITHOUT SPECIAL NEEDS

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ABSTRACT

CAREER AND TECHNICAL EDUCATION AS AFFINITY SPACES:
PERSPECTIVES FROM STUDENTS WITH AND WITHOUT SPECIAL NEEDS

Patrick J. Dunphy Jr.

The purpose of this phenomenological qualitative study is to explore the extent to which a career and technical education (CTE) setting offers students with and without special needs what they need to be successfully engaged. This study was positioned within James Paul Gee's affinity spaces theory as it was viewed from the perspectives of students. Participants in this study were 11th- and 12th-grade high school students with and without special needs. This study followed a heuristic approach to phenomenological research and made use of comparative analysis to simultaneously generate themes and theory. Phenomenology is an approach that makes determinations about what an experience means for those who have "lived" it. Manen (2016) refers to phenomenology as investigating the "originary emergences" of human experience and meaning.

Learners' experiences are often a reflection of the degree to which they are free to exercise choice in their learning according to their needs and interests. The freedom to choose, says Covey (2016, p. 77), is one of those "endowments that make us uniquely human." Success often lies in the results. Consequently, the degree to which the learning environment responds to the needs of students is always being examined. When a learning environment is nurturing as it is defined by Gee (2013a), it can assist in the successful engagement of a high school CTE student. Gee (2013a) writes that learning is a "conversation" so meaningful that we react and reflect with the world. Perhaps what is most important, says Gee, is that the learner needs the world to respond. This also

describes the very nature of learning in career and technical education (CTE). A CTE education is one that keeps skills in their contexts of application and meaning in the world (Gee, 2017).

Keywords: career and technical education (CTE), affinity spaces, CTE student, special needs student, +experiences

DEDICATION

This work stretched me. Gee (2008) describes that learning, at times, is or *should* be frustrating and life-enhancing. Mission accomplished. It presented me with one of the greatest challenges of my life. However, it found its equal in the immense love, strength, patience, and energy of my wife, Stefanie, and our children, Theodore, George and Alice. The greatest lesson here is to constantly challenge what you believe about yourself.

This is also dedicated to my mom, Elizabeth, and my dad, Patrick Sr. My mom has always driven forward the point that my siblings and I are capable of great things. And a word about my father, Patrick J. Dunphy Sr. There were no fathers before my father. He has been omnipresent in the care of his wife, six children, his grandchildren, and the Carle Place community. I am proud to be his son and share his name. One of the earliest lessons my father ever taught me was about balance. As a child, he would always tell me, "Let the tool do the work." This is something I have since passed on to my children and students.

This is also dedicated to my four sisters and brother, Eileen, Megan, Annie, Mary Kate, and John. About my older sister, Dr. Megan Dunphy-Gregoire, PhD, I truly could never have imagined that we would go from blasting Pearl Jam while playing video games in the early 1990s to discussing the merits of a qualitative versus quantitative research study. Good for us, and thank you for your help along the way. After this journey, I consider myself a firm advocate of qualitative research and the powerful impact it can have not only on the research—but also the researcher. For as Saldaña (2015, p. 10) so cleverly stated, "[I]f quantitative analysis calculates the mean, then qualitative analysis calculates the meaning."

I want to thank the entire Russo family in Brooklyn, Staten Island and Hawley, Pennsylvania. Specifically, my father-in-law, David, and my mother-in-law, Lorraine. The most generous, welcoming, and caring of people. David, every time I hear the White Album, I think of you. Lorraine, we miss you so much. You and I will always have cheese soup. "Let the circus continue."

I want to thank Dr. Randall Clemens, PhD for inspiring confidence in me and for challenging me when I barely had a breath left. I am forever grateful for how much you pushed me to be, in the words of James Paul Gee, a producer and a part of something that can potentially help so many kids and compel school decision-makers to do what is right for all learners.

I also dedicate the painstaking years of this work to the great school leaders I have come to know, most of whom having hearts that forever reside in the classroom. I have come to understand a lot about this work we do each day *and a lot more of what not to do* along the way. Maybe Peter Drucker and Warren Bennis as cited by Stephen Covey said it best: "Management is doing things right; leadership is doing the right things" (Covey, 2016, p. 108). I want to specifically thank Dr. William Poll, EdD for his guidance, positivity, and support over the years and for being someone who embodies that quote. I want to thank the teams I have had the honor of being a part of at St. John's University and the New York City Department of Education, specifically at Francis Lewis High School and Nassau BOCES. They all have been part of forming the person I am happy to be today.

The gratitude I have for the students who participated in this study is immeasurable. Too often, education is focused on our existing abilities. As a child

myself, I sometimes resented this. I felt badly about not achieving what someone else had presented as a standard. My resentment and misunderstanding would often get in the way of my potential. Like the students in this study, it would be a new context, the people around me, and the support that they provided toward what was often a shared interest in the work at hand that allowed me to get that much closer to who I truly am – I am excited about continuing on this path and in learning more about me. Like so many students in this study, I am a proud product of my environment.

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CHAPTER 1

Introduction

Preparing students for engagement in college and for career readiness is a priority of career and technical education (CTE) (Fitzgerald, 2018). Further, students with greater exposure to career and technical education coursework are more likely to graduate high school, be employed, and earn higher wages (Dougherty, 2016; Fitzgerald, 2018; Thessin, Scully-Russ, Hildreth, & Lieberman, 2018). Fitzgerald (2018) states that in the United States, approximately three out of four students graduate from high school on time. For those in CTE programs, nine of ten students graduate on time. Despite this, recent national enrollment has been on the decline. Dougherty (2016, p.1) suggests that the "damaged brand of vocational education" is a possible answer to why there has been a decrease in the level of CTE exposure in secondary education. That modern CTE offers pathways toward technical endorsements, program-specific credentials, and even college credit through dual enrollment and employability right out of high school cannot be overlooked (Gentry, Hu, Peters, & Rizza, 2008). Dual enrollment, sometimes referred to as linked learning, is one of multiple such pathways for students to achieve college credit while in high school (Lanford & Maruco, 2018). Additionally, CTE students have access to cooperative education opportunities, internships, and job shadowing. Cooperative education programs, or "co-ops," are work experiences outside the classroom where students spend some of their school week at a job in field related to what they are studying.

The Carl D. Perkins Career and Technical Education Act of 2006 ("Perkins IV") introduced strategic ways to address a decline in recent CTE enrollment. First, it referred

to "career and technical education" for the first time, formally rebranding it from vocational education and endorsing a modern CTE. Secondly, it linked academic and technical education for the first time since 1917's Smith-Hughes Act, which had done much to isolate CTE from the academic world (Dougherty, 2016; Fitzgerald, 2018; Gentry et al., 2008). Not to be completely left out, the 1963 Vocational Education Act, in part, advocated for the inclusion of occupational programs to exist in more comprehensive high school settings. And there was additional conversation in the interim. During the period from 1914 to 1968, there were six national panels responsible for reporting on vocational education. Five of these, such as the Committee on Vocational Education (1928-1929), were appointed by the president of the United States (Gordon, 2014).

More recently, there have been reductions in funding at the federal government level. The Obama administration requested a 21% decrease in FY2012 for Perkins. This may be due, in part, to perceived shortcomings in program outcomes (Library of Congress, Congressional Research Service, 2006). Before this, in FY2004, the Bush administration requested little to no funding for Perkins, because of a view that saw CTE as unable to demonstrate effectiveness. The Congressional Research Service's report on implementation warned that issues, including the hiring of qualified and knowledgeable CTE teachers, had the potential to resurface if and when reauthorization was considered in the future.

With each authorization came new performance indicators, however. Congress sought to strengthen the performance measurement system of Perkins IV in comparison to Perkins III by specifying separate indicators for the secondary and postsecondary

levels and by using several Elementary and Secondary Education Act (ESEA) indicators. The Association for Career and Technical Education (ACTE) was in agreement and called for consistency across states.

Current society differs markedly from how it was in the early 1900s and the 1960s. Progress is rapid in the areas of science, technology, engineering, and mathematics (STEM). This makes the contribution of career and technical education more significant and relevant (Gordon, 2014). In 2018, Congress reauthorized Perkins and thus created the Strengthening Career and Technical Education for the 21st Century Act, or Perkins V (*Strengthening Career and Technical Education for the 21st Century Act*, n.d.). This reauthorization is, in part, a response to calls for "federal investment" that dramatically "reshapes" CTE to ensure that it is adequately meeting the needs of all learners (Wagner, Newman, & Javitz, 2016, p. 1). When fully implemented during the 2020–2021 school year, Perkins V will add new program quality indicators and program requirements. Recipients of Perkins grant funds now need to conduct a Comprehensive Local Needs Assessment (CLNA). The transition year (2019–2020) is meant as a period within which to conduct this assessment. The school year 2019–2020 also calls for a transition year project that can be focused on, among other things, supporting students with disabilities.

Perkins V adds emphasis to areas that impact special populations. Under the New York State Education Department (NYSED)'s State Priority 1: Program Evaluation, as it is aligned with Perkins, this includes "individuals with disabilities" (CTE, n.d.). This work is largely data-driven and replaces approval of a "local plan" with a "local application." The key components of a successful CTE program also include integration

of rigorous academic content and authentic experiences for all learners. This occurs through a hands-on, problem-based approach that affords the learner an opportunity to see how their learning contributes to addressing real problems (Thessin et al., 2018, p. 5). Teachers of CTE are expected to demonstrate practical, real-world ties between assignments and the standards and expectations of their respective industries. There are several features of CTE that support student success toward these goals. These are surely an outcome of the family atmosphere and the larger social capital that exists year after year in the CTE setting (Lanford & Maruco, 2018).

The evolution of CTE is making it more popular as an option for students of all abilities. The Individuals with Disabilities Education Improvement Act (IDEIA) of 2004 mandated "transition services and preparation for adult life" (Schmalzried & Harvey, 2014, p. 1). These "transition services," says the IDEIA, are a "...coordinated set of activities for a child with a disability that is designed to be within a results-oriented process and focuses on improving the academic and functional achievement of the child with a disability to facilitate the child's movement to post-school activities." The legislation supports the goal that learners with disabilities will have success in the real world, which includes an industry environment. That the percentage of persons with disabilities in the workforce is markedly lower than those without is clear and raises certain questions (Schmalzried & Harvey, 2014, p. 1). Shifrer, Callahan, and Muller (2013) state that students with a poor academic history may simply be placed into a less rigorous class by teachers or counselors. Clearly, the focus of this type of decision-making prioritizes the shorter-term goal of high school graduation over the long-term goal of success in college or career. Gentry et al. (2008) make similar claims in their

research, including that gifted and talented students are being counseled away from vocational education. The fact that gifted and talented students have been overlooked for career and technical education experiences has hurt the growth and development of their talents. Placement in lower-level coursework to facilitate high school graduation can hinder progress in certain subjects and the development of certain strengths. Perkins IV is working to address this and states that it will provide access to learners with special needs and lead them to self-sufficiency. A study by Schmalzried and Harvey (2014) posited that both CTE educators and special educators need to create a collaborative learning environment for students with disabilities.

The power in CTE programming could present transition goals not unlike what one would see in an individualized education program (IEP). While offering praise of perhaps this type of customization, James Paul Gee (2013a) writes of the importance of adapting to new ways of learning because of the challenges that students can expect to face. A team approach offers opportunities to specialize and gain expertise in something that can contribute to a team through collective intelligence. A major feature of CTE is problem-based learning that directly channels the ambitions and passions of students, making them remember what they feel is valuable and important in their studies.

Passion is the highest possible level of interest (Quinn & Cockerell, 2018). Smith, Fisher, and Frey (2015) make reference to the importance of students framing their interests, hobbies, aspirations, and family lives with the work they do instead of shutting down their emotions. This should be framed correctly, however. Additionally, Lammers, Curwood, and Magnifico (2012) said of their findings on adolescent literacy that young

people use (and should use) various texts, discourses, and other resources to engage in their common passion.

Purpose of the Study

The purpose of this phenomenological qualitative study was to explore the extent to which a CTE setting offers students with and without special needs what they need to be successfully engaged, as measured by Gee's affinity spaces theory and as viewed from the perspectives of students. This study also explores how CTE students with and without disabilities perceive their learning experiences. This takes into consideration programming choices they made to be a part of a given class. The primary researcher in this study proposes that the power of a career and technical education is that it cultivates interest—interest that often becomes a passion. Interest is a supporting characteristic of affinity spaces (Gee, 2009; Gee, 2013a; Rosenberg, Greenhalgh, Koehler, Hamilton, & Akcaoglu, 2016). Research into career and technical education as affinity spaces is critical because it creates an opportunity to learn and support the students who participate in CTE. In their study of Twitter hashtag-based affinity spaces, Rosenberg et al. (2016) suggest further research be conducted, as it may provide valuable insight into how people participate in educational spaces on Twitter.

Perhaps the larger purpose for a study like this one, however, comes from Gee himself. Gee (2009, p. 82) states that today's youth are "confronted with and enter more and more affinity spaces." They see a more powerful "vision of learning" and of themselves. A social journey makes learning more powerful and personally unique. Classrooms can act as knowledge-building communities (Bereiter & Scardamalia, 1993). Often in science and social studies classrooms, students are asked to create or be a part of

a pretense where they conduct experiments as a "social scientist" would. Bereiter and Scardamalia (1993) argue that this process only gets students to the same endpoint that looking in a book would have otherwise done. Students are only focusing on what is already known and are not actually making discoveries. Too often, what is taught is focused on the existing abilities of students. *Perhaps, students need only be themselves.* Of course, original scholarship and discovery can look different depending on the learner—in part, because it is their curiosity that guides them. Jacobson (2013) writes of best practices in CTE and states that students work toward a credential or certificate at the end of their program of study. Students understand that achievement of this kind can only occur through rigorous academic requirements in an environment where the focus is on each student and the work they do. It is largely performance-based. To reduce the level of rigor means to set students up for failure at some point in their application of what they learn. Jacobson (2013) posits that the best approach is to create a classroom environment where rigorous expectations, communication, and learner engagement is present.

An important quality in this type of inquiry-based learning is in the knowledge-building discourse that takes place. For it to be productive, students need to constantly put energy into the work so that it advances. This is driven by interest and an affinity for what is investigated. Career and technical education program culture is built around exactly these types of principles and passions. Surowiecki (2005) writes in *The Wisdom of Crowds* that diversity of opinion is one important characteristic of a crowd and highlights that each person in a crowd offers both information and error, and in both, there is power to make judgements accurately as a group. Surowiecki often uses the stock

market or any market as an example where, because anyone with money can participate (and they don't have to be admitted or hired), a certain level of diversity is assured. A CTE learning space needs to be left just as accessible to interested participants and to participants with different skills and degrees of strength and competence. The learning space is to maintain the same element of strength.

Overview of Theoretical Framework

The framework the primary investigator used in this study is James Paul Gee's concept of affinity spaces. Gee (2017) suggests that, through interest, people become passionate about something. He states that when a learner engages through her or his interest, it can lead to affiliations with others who share similar interests, goals, and values. This societal affiliation is a requirement for learning and development.

More recent studies have emphasized this and suggest that people learn best from experiences, particularly those they have shared with others. Gee (2009, p. 67) defines an "affinity space" as a "place or set of places where people can affiliate based primarily on shared activities, interests and goals, *not* shared race, class, culture, ethnicity, or gender." They have an affinity for a common interest or endeavor, says Gee (2009). Learners are then able to make general meaning of something and eventually begin to think abstractly about it (Gee, 2013b, p. 2). As will be discussed further, a learning community will develop and transform as students develop their own identities.

Significance of the Study

Career and technical education is an under-researched, yet growing and increasingly influential, element of U.S. secondary education. Research states that an education that does not include at least some coursework in CTE simply does not go far

enough to close the widening gap between industry demands and workforce competencies (Lanford & Maruco, 2018). The National Association of Manufacturers' 2005 Skills Gap Report revealed that about 4/5ths of U.S. manufacturers were facing a moderate to severe shortage of qualified workers (Gordon, 2014). Additionally, researchers present evidence that when students with disabilities participate in CTE, there are positive impacts (Dougherty, Grindal, & Hehir, 2018).

There is a new push for increased advocacy and development of CTE. After a review of a recent study conducted by the state of Arkansas in 2014 to cultivate CTE, a recommendation to require students to become CTE concentrators was put forth (Dougherty, 2016). The hope here is to increase enrollment and develop curiosity in CTE into genuine influence. Consistently, recommendations include encouraging (or requiring) students to be a concentrator in a given CTE program of study (Dougherty & Zeehandelaar, 2017). For example, there is a recognized need for additional access to CTE opportunities for students with disabilities (Lombardi, Dougherty, & Monahan, 2018).

Perkins IV and the Every Student Succeeds Act (ESSA) have provided a framework for how to implement a successful CTE program and, in doing so, how to create a program that is equitable for different subgroups. The Every Student Succeeds Act has stressed the importance of integration of academics into CTE while encouraging states to include career readiness in their state accountability systems (Gottfried, Bozick, Rose, & Moore, 2016; Thessin et al., 2018). Specifically, and very recently, Perkins V (2019) has retained this focus and increased emphasis not only on enrollment but also on equity and accountability, particularly for learners with special needs.

Accountability in education is hardly a new concept. School systems, as recipients of public funds, are obligated to demonstrate how they use funding to support student achievement, with Perkins being the main source of specific federal funding for CTE. A recent assessment, however, presents that federal funding for CTE was 5%, the rest being funded by state and local governments (Library of Congress, Congressional Research Service, 2006). The state formula for allocation under Perkins favors states with higher populations of high school-age students. Further, population is based on the sum of the number of individuals in three age groups, each group being weighted. The largest weight (0.5) is assigned to the group of persons aged 15 to 19 (this includes the sample group in this study). This also includes special priority populations, such as those with special needs. This is a movement that only accelerated in the 1990s (Daggett, 2000). This motivated more attention to the outcomes of standardized testing than to future financial and job security for the current generation. Daggett (2000, p. 7) speaks to students getting "lost in the shuffle," however. Further, asking questions about the extent to which all learners receive a rigorous and relevant education.

Connections to Social Justice and the Vincentian Mission

Students with and without disabilities are not participating in CTE on the level they could be, despite the rich overlap that exists with regard to policy. Gee (2013a) takes a more aggressive stance in writing of an "anti-education era" rife with inequalities, where society should perhaps be questioning what constitutes a proper education. Gee asserts that students need to be "producers" and "participants" and not just "consumers" and "spectators." Burke (2013) agrees, specifically with regard to the importance of collaborative learning, and found that participation was somewhat lacking but very much

needed in schools today. Lammers et al. (2012, p. 6) refer to students as "content creators" in making a similar argument that sounds aspirational in nature.

Public school educators must begin to view their work differently, says Gee. The literature consistently illustrates that, as members of affinity spaces build social and cultural capital, they increase the degree to which they participate across different portals. Students engage when they are learning about a topic that has a perceived relevance to their lives and their potential to make an impact on their communities is high (Curwood, Magnifico, & Lammers, 2013). This is also related to a student's future identity and their commitment to themselves. Surely, if they are to guide a future generation, they first need to be confident in their own trajectory.

There is a barrier today for many poor and minority children. Gee (2009, p. 100) speaks of those "with a portfolio and those without." Further, an important part of this work is to help all students to find, create, and join their own "affinity spaces" and find equity in them (Gee, 2018, p. 12). For many students, career and technical education provides a voice and, as will be further noted, a comfort in their identity. It gives diverse learners a vehicle to an authentic audience who, for them, would not be there without it.

<div align="center">**Specific Research Questions**</div>

The purpose of this phenomenological qualitative study was to explore the extent to which a CTE setting offers students with and without special needs what they need to be successful, as measured by Gee's affinity spaces theory and as it is viewed from the perspectives of students. This study further explored how CTE students with and without special needs view their lived experiences, which is in part the result of the choices that

they make in their own education. Considering the research needs of this study, the following research questions were developed:

1. How, if at all, do student characteristics such as disability classification influence participation in a CTE program?

2. How does student preference for a specific CTE program influence participation in a CTE program?

3. What characteristics of a CTE setting influence student engagement in +experiences, which are defined as experiences that have three features: action, caring, and well-managed attention?

Definition of Terms

Career and Technical Education (CTE): Are organized activities that offer a sequence of courses that provide individuals with coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for future education and careers in current or emerging professions (Carl D. Perkins Career and Technical Education Act of 2006: Background and Performance, 2014).

Affinity Spaces: Are digital or physical spaces that are built around some kind of content and in which people interact with each other through some kind of portal (a portal being any means by which people enter the space) (Gee, 2004; Rosenberg et al., 2016). Loosely organized social and cultural settings in which the work of teaching tends to be shared by many people in many locations, who are connected by a shared interest or passion (Gee, 2018). A place or set of places where people can affiliate based primarily

on shared activities, interests, and goals, not shared race, class, culture, ethnicity, or gender (Gee, 2009).

Nurturing: The primary researcher in this study defines "nurturing" as actions that work to cultivate specific characteristics that Gee (2017, p. 16) refers to as necessary for advocating a lifelong education. These characteristics include being resilient, being a proactive agent, being a deliberate learner, being insightful, and being a "good chooser" (Gee, 2017, pp. 16–17).

+*Experiences:* Experiences that have three features: action, caring, and well-managed attention (Gee, 2017, p. 14).

"Mucking around": At its best, a form of play or horizontal learning that serves much the same function. Allows children to take risks, try different things, and fail without a high cost (Gee, 2017; Gee, 2018, p. 34).

Judgement System: According to Gee (2017), are values, norms, and the ways members of an affinity space engage in practices that are specific to the spaces.

CHAPTER 2

Review of Literature

Theoretical Framework

Much of his research having been based in learning through gaming, Gee maintains that often when engaging in video games, learners become alert to the fact that they need to assess their own progress and learning styles. In a gaming space, this is often to win or be successful in the game. Learners need to be proactive and make decisions as it becomes clear to them that they are in control of their own learning (Gee, 2009). Decision-making in this regard can include the types of interactions they choose to have with other gamers.

A traditional classroom tends to encourage an individual's knowledge and not distributed knowledge in the form of distributed teaching and learning. The same often appears true of distributed leadership among members of a given learning space (Curwood et al., 2013). It rarely affords students an opportunity to network and be rewarded or recognized for a collective achievement. Often, within career and technical education, learning takes place in this very way—in a community. This is in a learning space where full participation means a fully developed and engaged identity on the part of the learner.

There are some things that are so important to a cultural group that the group, fueled by their passion, ensures that everyone who needs to learn them has. Gee (2009) makes an analogy to learning how to cook, stating that most people do not learn how to cook by attending cooking classes. Instead, the process involves learners observing masters at work. Learners will collaborate with masters, using appropriate tools, and are

given feedback for their efforts (Gee, 2009). Gee (2013a) cites specific characteristics as being needed for "smart human action." Among these are examples such as an outcome being "at stake" (mattering to us emotionally) and an opportunity to act in a way that elicits a meaningful response from the world. These components contribute to what Gee (2013a) refers to as "the circuit of reflective action." Affinity spaces at their best, says Gee (2013b, p. 134), are "examples of synchronized intelligence." Further, "multiple tools, different types of people, and diverse skill sets are networked in ways that make everyone smarter and make the space itself a form of emergent intelligence." Thus, the sum of the whole is more than its parts. The collective is smarter than the smartest person in it. When learners learn a new skill set, says Gee (2009), they do it over and over until they become so good at it that it becomes routinized. But there is always the chance that they will simply become satisfied with their achievements and learn nothing new. The social aspect of an affinity space will assist and sometimes drive its members in understanding when it might be appropriate to move on to the next level of challenge. Some features of an affinity space, when implemented, are:

1. "People are in them (an affinity space) by choice. They are in the space because of a shared interest in a common endeavor, not because of their race, class, or gender. Their affinity for each other is based on a shared endeavor. In an affinity space people choose who they will be and which parts of themselves they will invest and share." (Gee, 2013a, p.135)

2. "People in the space have an interest in the common endeavor and some have a real passion for it. The space is built to fan interest into passion—but it does not

need or require passion. People can satisfy their interest and move on but they must respect the passion as an attractor to the space." (Gee, 2013a, p.135)

3. "The space recruits a diverse array of talents where even someone with limited skills or quite rare or special skills can find a place where their contribution counts. The space is designed to allow for multiple contributions, to leverage diversity so that no piece of knowledge or skills goes untapped. People are allowed to roam free if they want to and try new things." (Gee, 2013a, p. 136)

4. "In an affinity space, leadership and status are flexible. People sometimes lead and mentor and sometimes they follow and are mentored." (Gee, 2013a, p. 136)

5. "Affinity spaces link to other related spaces so that knowledge from the outside can transform the space and so that the space does not become an echo chamber of agreement. At the same time, each space retains a distinct culture, vision, and set of norms that is negotiated within the space." (Gee, 2013a, p. 136)

6. "There are many forms and routes to participation. Affinity spaces offer a variety of portals. People can participate peripherally or centrally. Patterns can change day to day or across longer stretches of time." (Gee, 2009, p. 78)

7. "There are many different routes to status. Affinity spaces allow people to achieve status if they want in many different ways. Different people can be good at different things or gain repute in a number of different ways." (Gee, 2009, p. 79)

The settings of affinity spaces can be varied. Teaching and learning are "not confined to one site or one kind of person," says Gee (2018, p. 8; Lammers et al., 2012). For example, Catholic affinity spaces might include everything from social events at a

local church or in the home to the Vatican in Rome. This is an important quality of an affinity space because when there is opportunity for chance encounters to take place among people from different and unexpected backgrounds, it leads to creativity. Lammers et al. (2012, p. 2) state that affinity spaces are "physical, virtual or blended spaces, often spread across many sites such as face-to-face meetings, message boards, blogs and web pages." Gee (2009) refers to this variety of access points as "portals."

Web-based portals are becoming more and more prolific as portals in the theoretical sense. Curwood et al. (2013) cite that 38% of adolescents share original creative work online and that young people are increasingly using online spaces to communicate and collaborate. CTE students at a regional center like that which was studied here often create group chats in the form of group text messaging. This is an interesting phenomenon on its own in that these students are not from the same home high schools or neighborhoods and so will not have the same opportunities for the aforementioned chance encounters to take place. They extend the social component that was born in the physical space of the classroom, shop, kitchen, or any number of other possibilities. Again, what is particularly unique about this is that these students most often do not come from the same district, let alone the same high school.

The world of CTE operates across many different sites and can include everything from industry sites themselves to medical students engaging in clinical experiences at hospitals and nursing homes. What is consistent is that each space is affiliated with the same goals and values. The setting of CTE is meant to address skills like problem-solving and teamwork (Dougherty, 2016). High school CTE students make a choice to come to a regional CTE center and to participate in a specific program. In their own way, they have

recognized that a full day spent at their home school is no longer sufficient to meet their needs in achieving educational success. Moreover, whether they realize it or not (and most students probably do), making this choice to enter a regional CTE learning environment is also a choice to enter its associated spaces.

Nurturing Affinity Spaces

In an affinity space, people are judged on their passion and desire to learn. Researchers Gee and Hayes (2012, p. 10) write of characteristics that define an affinity space. For example, they were emphatic about how important it is to the health of an affinity space that it is ageless. Gee (2017, p. 37, 2013b) states that nurturing experiential conversations between adults and children is foundational to the development of children's skills in "editing experiences" for long-term memory and for "building up their imaginative capacities." Gee and Hayes (2012, p. 17) posited that both individual and distributed knowledge are encouraged in a nurturing affinity space. Tacit knowledge is used and honored, leadership is porous, and leaders are resources. Indeed, identity is in part formed by social groups themselves. Gee (2017, p. 36) makes reference to "nurturing experiential talk."

Nurturing experiential talk is interactive talk about experience—something a CTE teacher can typically do with some ease after having likely spent time in the industry in which they now teach. Nurturing talk is made up of "stories about experience and commentaries on how one thought and felt in an experience." It grabs at the passions and interests of students who are looking toward possible similar experiences in their own futures. Further, it generally creates an avenue for students to inquire about a given experience while sharing their own related thoughts and while "using complex language"

to do so (Gee, 2017, p. 36). The findings in this study reveal that students do not aim to demonstrate their competence in a given skill by outperforming their peers but are, in most cases, motivated socially to cultivate their interest.

Career and technical education students often find mentors in the affinity spaces that Gee discusses. Perhaps a reason for this is a broad understanding on the part of CTE teachers of the multiple spaces that can impact a child's learning. A non-example of this is when Emdin (2017) writes about the spaces that urban youth come from and how they impact school performance. He discusses that "students exist in a space within the classroom where sometimes a teacher limits their understanding to what is happening to only that classroom space." Due to the "real-world" nature of CTE, career and technical education teachers enter the classroom with a different understanding. This understanding includes fewer limitations with regard to the world that their students will occupy. Perhaps a broader knowledge of the spaces that students are likely to occupy assists in a broader understanding of the spaces that students have occupied. Again, this is a claim Emdin (2017) makes when he stresses not only the importance of a safe and trusting environment for all learners but a recognition of the spaces from which these learners hail.

Students arrive in these interest-driven groups hoping for cultivation. Fitzgerald (2018) forms a position on a CTE learning environment, including that the ideal class size is about 15–20. She states that, in this environment, students are in a position to receive personal attention and form relationships with their teachers. An important factor in learning outcomes is sustained interest. This requires grit. Grit is defined as persisting past failure. For some, lack of learning achieved in school, for whatever the reason, can

be remedied with learning out of the traditional school setting. This occurs through an increase in grit on the part of the student. At a regional CTE center that educates the county's children, grit is a goal that students work toward. It is developed so that students can deal with complexity, find and use evidence to revise arguments in the face of evidence, and to produce and not just consume (Gee, 2013a). As stated previously, something that affords learners a greater opportunity is horizontal learning.

"Mucking around" is a concept lost on many school environments as a byproduct of the era of over-testing. Learners are moved up the "skill tree" too fast. Often, this happens at the "expense of horizontal learning." When students are able to "muck around," the pressure of time is lowered and the learner explores and takes risks (Gee, 2017, p. 34). This also provides equity by way of the fact that some students do not have the same opportunities to "muck around" in the home for varied reasons such as a lack of support. Gee (2017, p. 40) uses the analogy of learning to read, saying, "There is no need to stress being a good reader too early too much, to the detriment of the sorts of emotional attachments, experiences, talk and media that are the foundation of reading's meaningfulness and significance to the child." Students are able to develop their abilities. They also see that it is possible to do so.

Scheduling for CTE students has an inherent uniqueness. For example, CTE students do not operate on 45-minute periods. Instructional sessions last about 2 hours and 30 minutes. Merenbloom and Kalina (2013) write of CTE students needing to travel off campus to work and study in their chosen career pathways. In this case, a schedule needs to afford students with travel time and the ability to invest in this element of their

education. The list below presents features of an affinity space that are related to this study as described by Gee (2013b, pp. 135–137, 2009, pp. 78–79).

Situated Learning

Learning is an evolving form of membership. In *Situated Learning: Legitimate Peripheral Participation* (LPP), Lave and Wenger (1991) share the notion that learning is a process that takes place in a participation framework, not in an individual mind. Learning is "distributed" by masters with apprentices acting as "colearners" (Lave & Wenger, 1991, p. 15). Similarities exist in Gee's nurturing affinity spaces theory; the latter is built upon the former. This co-participation, say Lave and Wenger, has the potential to "transform the participants" and is referred to as "legitimate peripheral participation" (Lave & Wenger, 1991, p. 18).

While citing its importance, Gee (2009) defines the difference between a "community of practice" and an affinity space. There is no doubting the important force that communities of practice are to learning in the modern world. The major difference in an affinity space is the social configuration. Communities of practice are identified in terms of their members. What Gee (2009) is suggesting is that one start with the spaces themselves and not the groups. Further, if the discussion is about the spaces rather than the "community," the question can be posed about the extent to which people are interacting with the space. Participants can also enter and participate through different portals to access the spaces within an affinity space.

Legitimate peripheral participation should be viewed as a descriptor of engagement in social practice that leads to learning. Peripherality suggests that there are multiple ways of being "located in the fields of participation." To clarify, this is based on

how the community defines participation and is meant as the means by which there is "access to sources of understanding" (Lave & Wenger, 1991, pp. 35–36). Participation is based on negotiation and renegotiation. Understanding and experience are constituents of each other. Of importance here is situated meaning. Gee (2009) makes a language-based analogy to the types of user manuals and other related texts that come with a given video game. Young people typically make the choice to play first and read associated text after, if at all. The texts that come with video games are usually very difficult unless the user has had some experience playing the game. Here, the experience of playing the game will provide meaning when reading the text. Much of gameplay here includes interaction with other "gamers" in a virtual affinity space. This also goes a distance in describing many students in a CTE program. These are learners that would prefer to spend more time "in the shop" than the classroom, but most understand that both are meaningful to gain a full understanding of the content. When a source of understanding is in another member of the affinity space, legitimate peripheral participation is not mere apprenticeship. Instead, it works more to serve as an analytical viewpoint on learning in order to better understand what it means to learn in the first place, say Lave and Wenger (1991, p. 40).

+Experiences

Gee (2017, p. 33) posits that children learn best from "+experiences." A "+experience," says Gee, is "when a person has an action to take and cares about the outcome…" He asserts that the human mind works best when it can "build and run simulations of experiences in order to understand new things and get ready for action in the world" (Gee, 2009). Essentially, things tend to go better when one has had experience with them in the past. Children today, says Gee, are having more and more learning

experiences outside of school that are important for their futures than inside the school environment (Gee, 2009), the recommendation being that people need to be "lifelong, deliberate learners" and "self-teachers" (Gee, 2017, p. 27).

Where a foundation for learning is incomplete, teachers and mentors need to design good +experiences and meaningful play opportunities (Gee, 2015, p. 38). This connection is healthy. Brown (2017, p. 8) asserts that connections "are why we are here." Connections give us purpose and meaning and complete an experience for the participant. They include cultivation of trust and creativity, which builds resilience in a person as a learner. The learning environment within career and technical education emphasizes features that create +experiences that nurture the CTE learner and have the potential to create a resilient+ person (Gee, 2017).

Discourses

Discourse is an important part of recognizing the extent to which an affinity space is a nurturing one (Gee, 2015). Members of a nurturing affinity space operate mostly within what Gee refers to as a content design. Content design works with recipient design to form a context that each member of any space can orient to. Discourse works to construct the topic. It defines and produces objects of our knowledge. Gee (2015, p. 5) contended that, since we cannot read each other's minds, understanding the intentions of one's thoughts is "socially negotiable" in nature. This occurs through dialogue that is transacted within a space within the affinity space. Further, how we negotiate these events is based on past experiences. Lave and Wenger (1991, p. 51) spoke of similar attributes in their research on participation and learning and in writing about phenomenological research methods. Moustakas (1994, p. 57) states that "reciprocal

correcting of reality takes place in social conversations and dialogues." Manen (2016, p. 36) takes the stance that discourse can take on a nonverbal state at times, stating that sometimes, there can be a "good talk without uttering hardly a word." Through discourse, people are "testing out" their understanding of each other and their knowledge of something—all in the search for truth.

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Review of Related Research

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A review of related literature reveals the wide scope of an affinity space and its construction in varied settings, including career and technical education. This includes how one feature of the space compares to or works in collaboration with another. The primary researcher in this study has considered the advice of Glaser and Strauss for the novice researcher to delay the literature review in the name of developing a fresh theory (Charmaz, 2014). Though challenging without the clarity of the full picture, it is difficult for any research to be cumulative and to bridge a gap between past and future (Sutton, 2016). The research points in several important directions and emphasizes how to be mindful of specific gaps when conducting future studies. This study researched the perceptions of high school CTE students with and without special needs. The literature review sought to qualify an understanding of the phenomenon of affinity spaces as it relates to the CTE setting.

Career and Technical Education

Perhaps the best way to examine the current state of CTE research is to first visit the recently more familiar world of Science, Technology, Engineering, and Math, or "STEM." Throughout the last few decades, Perkins-related legislation has also impacted STEM-related programs. The Carl D. Perkins Vocational and Applied Technology

Education Amendments of 1998 and their subsequent reauthorizations have provided additional funds for the development of applied STEM curricula (within the larger CTE curriculum). It is important here to note that CTE is regarded as a parent to STEM. Moreover, we should define *applied STEM* as being different from traditional academic STEM in that it is not heavily focused on theory and instead concentrates more on skills-based, tangible, real-world problem-solving. What is typically regarded as CTE can also be regarded as applied STEM (Gottfried & Sublett, 2018, p. 2). Applied STEM stresses the application of academic concepts to the real world. Problem-solving in the applied STEM or CTE classroom looks not unlike the daily challenges a person would expect to face in a STEM-related career (Gottfried et al., 2016, p. 3).

Often associated with modern CTE is a shortage of persons available and/or able to fill skill-specific jobs (masons, carpenters, plumbers, etc.). Toppin (2018) conducted a study that reviews some related history here. His research states that in the past, students as early as fifth and sixth grade were encouraged to take "shop" classes, but by the 1990s, these were being replaced by career academies at a later stage in a student's academic journey. The purpose of Toppin's (2018) study was to examine this trades-shortage crisis and review strategies that might be considered in reversing it. Toppin (2018) cites the average age of a skilled tradesperson to be 56 years. With emphasis, the author states that by 2020 (the year of this study), there will be a need for 10 million new skilled workers. There are clear contributors to this building trades shortage. Toppin (2018) identified a few such contributors. First, there is a decline in high school technical education programs, fueled by students being encouraged toward college and what is thought of as a higher-paying future career. As has been stated, fewer students are taking credits in

CTE coursework. Further, Toppin (2018) cites a 2009 study that found 74% of ninth graders who did enroll in CTE coursework did not go on to work immediately following high school, as had been tradition.

There is a misconception that higher education always equals higher income (Toppin, 2018). Research suggests several strategies meant to address this issue. Namely, make it a national priority, increase the number of women and African Americans in building trades careers, and expand on apprenticeships. By design, some CTE programs are apprentice-type learning in nature. Many programs, such as welding and those in the automotive fields run their classrooms as literal "shops." This type of environment is critical to student success. Lanford and Maruco (2018) conducted a qualitative study that examined the deep influence the learning environment can have on learners. Data collected through a semi-structured interview process and over a 12-month period revealed the value that exists in the connection between classroom learning and real-world industries.

Affinity Spaces

Affinity spaces have been defined as design-oriented. Design often takes place around social capital (Lanford & Maruco, 2018; Marone, 2015). For example, considerations that support creativity as an outcome of social processes are encouraged. Marone uses the lens of social games such as *Minecraft* to articulate this, and Marone and Gee (2009, 2013b, 2017) are in agreement on several points. For example, Marone provides the general view that becoming producers and not just consumers of artifacts can motivate learning and lead to higher-order thinking skills. Findings in this study reveal that users took certain knowledge of the participants for granted, not seeming to

ask questions for clarification when it came to, for example, definitions of terms related to *Minecraft*. However, a user might ask another participant to post a video of how something was created. Participants preferred "showing over telling," and "showing off" was a motivating factor, where participants would complement others for their creative contributions (Marone, 2015, pp. 8–10). It was clear that participants cared very much about what they created and about being known for making such contributions. While this may reveal a degree of passion for a given subject, it may not inspire legitimate peripheral participation (Lave & Wenger, 1991), mentoring and leadership, or the diverse range of skills present in an affinity space (Gee, 2013a).

Social capital is of tremendous value with regard to what makes career and technical education successful. Lanford and Maruco (2018) conducted a qualitative study that examined investigating the characteristics that make a CTE center effective and viable. McKenna (2017, p. 2) conducted a mixed-methods study that asked, "What characteristics of affinity spaces, as defined by Gee, are exhibited in distance (online) higher education learning spaces?" Findings revealed that distance (online) higher education learning spaces that were studied here were affinity spaces to the extent that they met all but three of the characteristics put forth by this study, as described by Gee. Similarly, a pioneering investigation into state educational twitter hashtags (SETHs) (Rosenberg et al., 2016) illustrated how hashtag-based spaces can be affinity spaces. They are teacher (participant)-driven, unmoderated, public, and thriving. Curwood et al. (2013) had similar findings in their ethnographic study into online affinity spaces. Here, participants in a *Hunger Games* affinity space took advantage of multiple routes to participation, communication, and collaboration.

SETHs are a phenomenon that could change the way teachers acquire professional development, say researchers (Rosenberg et al., 2016). Most previous research into SETHs was conducted on the basis of teacher perception in regard to how they participated. In attempting to determine the degree to which Twitter-based hashtags, and specifically SETHs, served as affinity spaces, the researchers analyzed 47 key SETHs that serve as education- and region-specific affinity spaces. The study sought to understand the characteristics of an affinity space over a six-month data collection period to gain initial insight into how these spaces function. Specifically, the study examined who the participants were, the types of interactions they had, how often and when they interacted, and which portals they used to interact. Of note here is the inclusion of spam accounts. The researchers stated that these were unlikely to have undue results on the ultimate findings of the study. Most Twitter accounts in the study belonged to teachers, followed by what the study titles education stakeholders and administrators. Findings revealed that SETHs were self-driven and voluntary. Further, SETHs served as affinity spaces for teacher collaboration, interaction, and learning (Rosenberg et al., 2016). These are features of Gee's affinity spaces and are specific to those that this research will measure: the extent to which a CTE environment is an affinity space.

The CTE environment shares many of these characteristics, such as its being self-propelling and voluntary with regard to the opportunities that students have to make choices about their learning. Gentry et al. (2008) identified four themes that emerged in a qualitative study that examined the experiences of gifted and talented CTE students. One such theme was that students felt value in being able to work with others who have common interests and abilities. Other characteristics of Gee's (2009) affinity spaces were

present in Gentry and her colleague's (2008) findings, such as the ability for students to make choices and be challenged routinely on an individual level. There was a great deal of individualization and self-pacing in CTE—a key component in gifted and talented education and a nod to the importance of horizontal learning. The study concluded that the CTE center researched in the study offered many opportunities for student-centered choices to be made, that the teachers were developers of talent, and that students had access to career and technical student organizations for youth (CTSOs) such as SkillsUSA. Students spoke of the CTE center's ability to provide an outlet for their advanced learning needs. One student in the study articulated the importance of her being able to choose her placement and specific projects in criminal justice as a means to her graduating high school with 15 college credits. Indeed, sometimes students let their passions speak for them in a way that, without guidance, might come off as tendentious. While Rosenberg et al. (2016) and Gentry et al. (2008) measured their study against a few of Gee's affinity space characteristics, Lammers and colleagues made use of and proposed that there are nine such characteristics in contemporary affinity spaces (Curwood et al., 2013; Lammers et al., 2012).

Similar to career and technical education, affinity spaces allow for participant access to learning materials outside of the central geographic area seen as the traditional learning environment. Lammers and her colleagues studied adolescent literacy across affinity spaces. The study encouraged further research into how a better understanding of affinity spaces can enhance pedagogy as learning increasingly enters online portals. Findings concluded that affinity spaces serve as useful sites for researchers. Specifically, that online affinity spaces help to develop a sense of community that this helps to support

motivation and creativity. Lammers et al. (2012) acknowledge, however, that emphasis for researchers should be on community. These researchers offer certain advice for future research. Namely, that participation around a common endeavor is important in that it stretches across geographic boundaries, rendering them less meaningful than they are otherwise thought to be. Secondly, that participation is self-directed and that this is a waving flag for the future researcher to be mindful of. The primary researcher in this study is alert to the fact that self-direction in an affinity space affords almost limitless opportunities for portals to learning to exist. Another note from the findings of this research is for future researchers to consider the design choices of participants, in this case, students. Specifically, the extent to which they might have been impacted by related affinity spaces, such as a home environment that includes a parent or other family member engaged in the same trade.

Student Identity and Leadership as an Outcome of Learning in Affinity Spaces

Student identity, and the degree to which an educational setting cultivates it, has emerged as an important contributor to student success. Gee (2009, p. 33) argues that learning is all about identity, stating that children will identify and "disidentify" with teachers and students that they "perceive as hostile, alien or oppressive" to their identities. A group with a special interest or affinity for something will often create its own language as a means by which to work collectively toward a shared goal (Gee, 2017). Further and for example, instead of resting completely on the teacher, leadership and mentorship in an affinity space can be distributed across many individuals, texts, and students (Curwood et al., 2013). When learners believe in themselves and are confident in their own self-efficacy, they are able to set more effective goals (Curwood et al., 2013).

They are more willing and likely to take constructive feedback from those who share their interest. It would seem that students have both a real and imagined audience that plays a factor in the degree to which participants present themselves (Curwood et al., 2013; Lanford & Maruco, 2018).

Gee (2000, p. 13) refers to "affinity perspectives" or "A-Identities." He goes on to explain it through the use of an analogy to being a *Star Trek* fan or a "Trekkie," saying that part of what defines this person's identity is developed through the experiences they are exposed to, such as meeting the actors who portray the characters. Another part of what helps "Trekkies" to shape their character is through their participation in these events with others who share the same interests and passions for *Star Trek*. Affinity groups have other characteristics that can be dominant at certain times and make contributions. A question Gee (2000, p. 9) asks in this regard is: For a given student, is this a part of their "calling" or is it an "imposition"? Additionally, parts of identity that also invariably contribute to the affinity group are other "traits," such as a participant "being charismatic." Gee presents that being charismatic only truly happens when one is with someone else or a group (Gee, 2000, p. 11). In general, learners are aware of a significant identity that is part of where they are headed, and they wish to hold "membership in a larger cultural group" (Gee, 2009).

Burke (2013) conducted case-study research to examine how children enact different identity stances fluidly across different play spaces. The sites of this study were multimodal and included virtual play spaces. Similar to this study, interview data was collected from 20 participants. The researcher interviewed 20 ten-year-old children over a period of three years. The study eventually focused on just three of these children, all in

the same fourth-grade class. Not only did the researcher look at the real persona of these children, but also their projected identity as they created it in any of a few different video games. This was triangulated by contrasting the behavior with other documents, such as written text and data from interviews. Burke found that there was a strong emotional connection that existed whether they were online or offline and that, in general, the children's online personas extended beyond the online world. Gee (2009, p. 85) theorizing on affinity spaces and often while conducting research into gaming, states that the merits in video games are that they allow people to be "new things in new worlds." Sometimes even going far beyond what they might be able to accomplish in the "real" world. Rosenberg et al. (2016) conducted a study into Twitter hashtag-based affinity spaces and suggested more research should be conducted into how participants' individual-level characteristics affect their transition from beginners to central members of the community. Gee (2009) defines identity as existing when one is acting in accordance with the parameters that exist in a given setting. He says nothing here about the degree of talent in a given area. To paraphrase his example, if you are making legal chess moves, you are acting out the identity of a chess player because you are making appropriate chess moves. This does not mean that you are good at chess.

Similarly, Scholz (2017, p. 3) conducted a study in which the game *World of Warcraft* was studied in an effort to determine the extent to which it could function as an affinity space. Findings in this study concluded that *World of Warcraft* provided an "immersive" environment for, in this case, learning a new language. Further, this was especially true when the learner approached the situation with a willingness to learn and an eagerness to engage. The primary researcher in this study questioned the extent to

which this dynamic will be consistent where students have the ability to choose a program of interest to them and corresponding learning experiences. This study maintained that each player (learner) was bound to approach the process in various and unique ways. CTE provides access points for all types of learners.

There is very little research regarding gifted and talented students and their participation in career and technical education. Gentry et al. (2008) conducted a qualitative study at a regional CTE center in a rural midwestern area that investigated identifying such students and posits that the lack of research may indicate a climate where these students are underserved in CTE. This study also investigated the experiences these students had in their CTE program. Though conducted at only one site, Gentry and her colleagues chose nine CTE programs at the site as the center of this research. Students were identified as talented by their teachers. It should be noted that "talented" was defined as being talented in their trade area and not necessarily in any academic sense. Ultimately, results of this study were based on data collected from 14 students from eight different programs. Data was collected with the researcher being the primary instrument, and the results of coding revealed four themes. Of note was the relationship students felt that they had with their CTE teachers and how it shaped their confidence level. One study stated that, at the CTE center, teachers looked for "what they did right while at the home school teachers looked for what they did wrong" (Gentry et al., 2008, p. 5). The research of Casale-Giannola (2011) also emphasized the importance of the teacher–student relationship in CTE and the impact it has on student success, particularly during adolescence. Casale-Gianola conducted a qualitative study in 30 CTE classrooms where she took on the role of participant-observer. Classes observed were

everything from carpentry to cosmetology to the performing arts. Findings presented that differentiation was prolific in the CTE setting. This included student choice of content and process, with multiple opportunities to learn things through repetition, or what is sometimes referred to as "over-learning" (Hattie, 2017, loc. 495 of 5563). An important characteristic of an affinity space, to be sure, which also has been found to be present in positive experiences gifted students have in CTE (Gentry et al., 2008). Casale-Giannola makes comparisons to the academic settings as too abstract to engage all learners, particularly those learners who prefer the "making and doing" that is often seen in the CTE setting.

There is also great importance in the relationship between teacher and student. During adolescence, young adults are beginning to develop their own identity. They are developing emotionally. CTE doesn't solve all the issues that students arrive with. Common issues are basic skill deficiencies in reading and other cognitive skills. The rigor that exists in taking specific licensing exams in CTE requires added support if students are to meet this and other challenges. Casale-Giannola recommends a special education teacher push-in to given classes to ensure that students have the greatest opportunities for success. Schools need to devote time and resources to develop administrator, teacher, and stakeholder competency and understanding around how social and emotional learning content influences relationships. It needs to be done with fidelity as it impacts student achievement (Philibert, 2017).

A study by Pellicone and Ahn (2018) reviewed game spaces and the ways that socially connected gameplay can serve as an engaging learning environment. A major focus of this study was an effort on the part of a participant, "Ben," to background and

foreground given information that would describe himself, such as race, and the way that he would negotiate these descriptors within the space (Pellicone & Ahn, 2018). Further, this study researched how this factored into the level of inclusivity that a participant like Ben received in the space. That a family-like atmosphere exists within CTE is often repeated. A study conducted by Lanford and Maruco (2018, p. 19) had one participant stating: "Our class is like a giant family, we all take care of each other, but we are on top of each other's stuff too." Characteristics that make up who a participant is will impact the extent to which that participant engages in a study. Research illustrates other similar examples of students overcoming depression over a personal challenge and development (Curwood et al., 2013).

CTE and Students with Disabilities

Recent legislation has propelled more students with special education classifications into the general education setting (Casale-Giannola, 2011). There are unique challenges to learning applied STEM skills (like those often learned in a CTE setting) and concepts among those with disabilities (Gottfried et al., 2016, p. 3). Gottfried and Sublett (2018, p. 2) conducted a descriptive study in which they found a lack of learning-disabled students participating in applied STEM nationwide. One reason for this, state these researchers, is the academic performance of students with learning disabilities prior to entering high school, where the response is placement in lower-level mathematics and science courses (Gottfried & Sublett, 2018, p. 1). The same research found that "STEM gaps" exist long before high school and will have major implications for students with learning disabilities, not to mention the general economy throughout the next decade. Those having STEM-related skills will enjoy the benefit over those students with

special needs who are currently underrepresented in applied STEM classes. Ultimately, the study, which followed 10th-grade students (of which 6% were found to have a learning disability) from 750 different schools around the United States, found that students with LDs were less likely to enroll in applied STEM courses but were more likely to take other types of non-STEM CTE courses (Gottfried & Sublett, 2018, p. 14). Gottfried et al. (2016, p. 1) put forth the assertion that "few teachers are aware of the presence of materials and resources required to educate students with disabilities in STEM." The result is that students with special needs are dramatically underrepresented in STEM careers.

Possible solutions for how to engage CTE students with special needs are offered in how students with special needs are engaged in the technology and engineering (T&E) setting. White (2015) writes of more engaging techniques to use in T&E students with special needs, such as emotional issues and psychomotor difficulties. The approach centered around empathy and left an impression on the participants (future teachers of T&E students with special needs), as the article writes of the participants' simulated experiences as students with psychomotor or other difficulties, such as blindness. In an affinity space, no one is stopped from gaining intensive knowledge because someone else thinks "they are my low" or "struggling" students (Gee, 2009, p. 80). What all learners present holds value and can be a potential resource for others.

According to Wagner et al. (2016, p. 2), exposure to CTE offers a variety of benefits for students with disabilities, including a 2.6% lower dropout rate. Students with intellectual disabilities seemed to be the only classification of students to not enjoy the same level of benefits from CTE participation. The study by Wagner et al. (2016)

addressed two primary questions: What were the CTE participation rates of students who were learning disabled, and what were their postsecondary employment experiences? The participants in this study included more than 11,000 high school special-education students, ages 13 to 16. Further, findings revealed that the effect of earning four or more credits in occupationally specific general education CTE on full-time employment up to two years after high school was statistically significant (Wagner et al., 2016, p. 3). Casale-Giannola (2011, p. 1) states that students in a CTE program understand the purpose and outcome of their efforts. The same research identified the longer period that students spend together as a factor in the increased cooperative learning that takes place. Students were found to "support one another and make contributions to a team project" (Casale-Giannola, 2011, p. 10). When reporting on applied STEM, Gottfried and Sublett (2018) state that the very nature of learning through activities that exist in applied STEM makes it more accessible to diverse learners.

There have been more recent studies that have evaluated CTE enrollment for students with disabilities. Theobald, Goldhaber, Gratz, and Holden (2019) conducted a quantitative study using longitudinal data in Washington State. This study investigated relationships between CTE enrollment and secondary and postsecondary outcomes. This research examined CTE "concentrators." The study defined a concentrator as a student having at least four credits of course work that provides academic and technical skills for future careers and independent living. Rates of concentration revealed 35.6% of students with learning disabilities having taken a concentration in a CTE course. Students with learning disabilities were also more likely to be underrepresented minorities. Of great importance to this proposed study is that students with learning disabilities who were

enrolled in a CTE course in 11th grade had slightly fewer absences than did observably similar students who were not enrolled in a CTE course. Further, this illustrates the need for a qualitative study that examines the characteristics of a CTE setting that influences student engagement. Theobald et al. (2019) acknowledge the small sample size of their study may raise questions about the generalizability and robustness of these findings. Also of note is that this study was the first statewide study to consider the relationship between CTE enrollment and post-secondary outcomes for students with learning disabilities. It did not include all disability types. It recognized the existence of selection bias. For example, parents had great influence over where to send their children, depending on the special education services that existed in a specific school or school district. Indeed, parents play an important role in supporting their children in preparing for college and careers, one study finding them to have the largest influence (Fitzgerald, 2018).

Students with disabilities have been found to be neither overrepresented nor underrepresented in CTE as a whole. According to a meta-analysis study conducted in 2016 that included 100,000 students, they were overrepresented as concentrators in programs such as manufacturing and transportation (Dougherty, 2016, p. 5). According to the same study, on average, students with disabilities took "half a class more" than their peers without a disability (Dougherty, 2016, p. 18). Casale-Giannola (2011, p. 1) conducted a qualitative study that found that CTE coursework provided "excellent opportunities" for students with disabilities. Observations in 30 different classrooms were contrasted with interviews with related service providers to identify the benefits and challenges of inclusion in a CTE setting. Findings revealed that CTE classrooms were

prolific in their ability to differentiate material. Research noted that this occurs through student choice and instruction that supports student interests. Casale-Giannola's (2011, p. 3) research recommends creating one-page "student profiles" to assist teachers in a student's classification and related best practices and strategies to assist a student with disabilities. Part of the rationale for this was that she found many teachers to be unaware of the degrees of accountability that have existed since the enactment of IDEIA and the No Child Left Behind Act (NCLB) (2004).

A study conducted by Schmalzried and Harvey (2014, p. 3) investigated the perceptions of practices used by CTE and secondary education teachers with special-needs populations. Morningstar, Lombardi, Fowler, and Test (2017, p. 1) conducted a qualitative study that non-academic skills such as critical thinking and self-monitoring should complement "student engagement and motivation" when thinking about college and career readiness. Furthermore, that study's purpose was to create college and career readiness (CCR) after achieving needed clarity through the work of focus groups. Psychosocial beliefs such as sense of belonging and academic mindsets that impact perseverance and social skills were present in that study (Morningstar et al., 2017, p. 2). The same study is critical in how it describes the curriculum that students with disabilities (SWDs) receive, stating that it is generally less rigorous. The results of the study organized six different domains and "added specific descriptors" (Morningstar et al., 2017, p. 4). Some participants in the focus groups strongly advocated for "the inclusion of a career technical education knowledge content area, given the importance of both general and specific career content knowledge" (Morningstar et al., 2017, p. 7). Gentry et al. (2008), in a qualitative study that is largely about gifted students in career and

technical education, speaks of the need to accommodate all learners, including those with special needs.

Shifrer (2013, p. 3) conducted a study that examined expectations for students with disabilities and that asked, "Does the learning disability (LD) designation function as a label and produce negative stereotypes?" and "Do teachers or parents have more power to enable the school LD designation to stigmatize?" The purpose of the study was to assess the degree to which the LD label "produced a stigma" and, with it, related disadvantages. Findings suggested that adolescents designated as having disabilities are more socially disadvantaged and have poorer academic histories than those without such a designation. Further, the study discussed that stigma is a "product of social relations."

CHAPTER 3

Methods and Procedures

Research Design and Methodology

Research questions will be addressed using a qualitative methodology based in grounded theory. Phenomenological research is a qualitative approach that works to understand "common or shared experiences of a phenomenon" (Creswell & Poth, 2018, p. 78). The researcher sometimes accomplishes this, in part, by collecting and interpreting data while becoming a part of the research process—often as much a part as the participants, themselves (Corbin & Strauss, 2015). This researcher studied the experiences that students with and without special needs have in a CTE setting, and so the use of a phenomenological approach was beneficial in making determinations. Phenomenology aims at description and interpretation. Moustakas (1994, p. 13) wrote that the goal of phenomenology is to "determine what an experience means for the persons who have had the experience and are able to provide a comprehensive description of it." Phenomenology works to investigate events and feelings that correlate to lived experiences. The central effort is to somehow return to the world as we originally experience it.

Specific Research Questions

1. How, if at all, do student characteristics such as disability classification influence participation in a CTE program?

2. How does student preference for a specific CTE program influence participation in a CTE program?

3. What characteristics of a CTE setting influence student engagement in
+experiences, which are defined as experiences that have three features: action,
caring, and well-managed attention?

Sample Discussion

Career and technical education students make a choice as to the program of study
they would like to participate in. Gaining entrance into the program of their choice will
play a role in the way that meaning is formed. When expressing themselves, a participant
in a phenomenological study brings their opinions, thoughts, reactions, and interactions
into being in a "lifeworld" that includes a "special affinity or attunement to each other
and to their shared world" (Manen, 2016, p. 36, 2017, p. 11).

This research study asked: "What is the nature of the phenomenon as
meaningfully experienced?" A CTE student who describes their lived experiences will
employ these emotions in how they orient themselves to the phenomenon as it is
important (Manen, 2017, p. 4). When examining Descartes, Moustakas (1994, p. 27)
wrote that the perception of reality is "dependent on the subject." In this study, CTE
students and teachers were the subjects, and as such, they were the best source of
evidence to draw from in this phenomenological study.

Certainly, a person is present in what they perceive. CTE students with and
without special needs had similar perspectives on the experiences they had in their
respective CTE programs. This, in turn, shaped their perceptions of the learning
environment, and, in phenomenology, perception is regarded as the primary source of
knowledge (Moustakas, 1994, p. 52). Ultimately, this study examined the perceptions of
students as a means of understanding related attitudes and behaviors that came from the

lived experiences of each student. It is not simply about recalling experiences, however. The meaning structures must exist as they did when they were lived through by the participants.

Participants

Participants in this study had diverse characteristics. The entire student body is made up of 282 students, just over 100 of whom are students with special needs. These students range from those who are learning disabled to students on the autism spectrum to those who are emotionally disturbed and speech and language impaired. Just over 200 are from one sending district with two different high schools. In general, students are from any of six different high schools in one county in Long Island, New York.

Students. Students in this study were those with and without special needs (see Table 1). Of the 20 students interviewed, nine had special needs and 11 did not. The nine students with special needs had a range of disabilities, most of which (four) were learning disabilities. There was one student who was classified with emotional disturbance, two students who were classified as other health impaired, one student who was speech and language impaired, and one who had a 504 plan to assist with an ocular issue known as "convergence" that can manifest in performance difficulties. Most student participants came from automotive technology and cosmetology. This was proportional to where most students are enrolled at the site of the study.

Table 1

Overview of Interview Participants (Students)

Identifier	IEP	Program	AM/PM	Gender
"Ricky"		Automotive Technology	AM	M
"Tucker"	Y	Automotive Technology	PM	F
"Elaine"	Y	Automotive Technology	AM	F
"Jimmy"		Medical Assisting	PM	M
"Eunice"		Computer Animation	AM	F
"Nidhi"		Medical Assisting	AM	F
"Zeus"	Y	Construction Electricity	AM	M
"Betty"	Y	Culinary Arts	PM	F
"Andrea"		Computer Animation	PM	F
"Hope"	Y	Cosmetology	AM	F
"Donna"	Y	Medical Assisting	PM	F
"Alice"	Y	Police Science	PM	F
"Tony"	Y	Automotive Technology	AM	M
"Leona"		Cosmetology	PM	F
"Cecelia "		Cosmetology	PM	F
"Natasha"		Cosmetology	AM	F
"Finn"		Automotive Technology	AM	M
"Madison"		Construction Electricity	PM	M
"Paul"		Automotive Technology	PM	M
"Luke"	Y	Computer Animation	PM	M

Staff. Staff in the study were a guidance counselor, a school social worker, and a special education teacher (see Table 2). The guidance counselor has over 20 years of experience in career and technical education at the secondary education level. The school social worker has over 10 years of experience, and the special education teacher has seven years of experience in the field. All staff members serve the entire student body, and thus, all student-participants in this study.

Table 2

Overview of Focus Group Participants

Guidance Counselor	"Marie"
School Social Worker	"Rey"
Special Education Teacher	"Polly"

Setting

The location for this research was a standalone regional CTE center that serves about six district high schools in one county. A standalone CTE center is identified as being a CTE site that is not attached to a secondary building or campus, where "sending" or "home" high schools send students for CTE programs and services. This specific CTE center is collocated in a building with the central offices of one of its sending districts. Though rich in its diversity in terms of origin around the county, the population sample for this research was conducted in one building. This could have an impact on generalizability in terms of its generalizability outside of this standalone regional CTE center.

Sample Size

In attempting to achieve "theoretical saturation" (Creswell & Poth, 2018, p. 369), the primary researcher in this study employed purposive sampling in order to interview and observe 20 CTE students with varying classifications—all of whom have experience with the phenomenon. All student-participants came from varied CTE programs within the site.

A goal of sampling was to maximize differences in the sample as a means by which to bring out the widest possible coverage, including with regard to disability classification, sending high school, CTE program, and gender. Given the nature of comparative analysis, other factors did emerge, directing toward some ontological pathways in the study and its analyses.

Data Collection Methods

Phenomenological data are the "data of experience." Data are accepted or rejected depending on the manner in which they were collected (Giorgi, 1971, pp. 8–10). Data collection in this study involved interviews of individuals who experienced the phenomenon. The primary researcher in this study was the principal investigator and was the primary instrument of data collection. Constant comparative analysis is systematic and emergent in nature and remains close to the data while ensuring consistency and creativity as "accumulated knowledge becomes integrated" (Glaser & Strauss, 2017, p. 109). This is joint collection, coding, and analysis of data as the underlying operation so that a substantive theory can be generated from the data first before a researcher can see relevant categories and hypotheses emerge that are in line, to whatever extent, with a formal theory. As theory emerges, it points to next steps in terms of where to go for

further data collection. Because the possibilities were infinite at the start, the theory guided practice and kept the researcher grounded. At relevant points, reduction and generalization more freely took place.

In order to generate a substantive theory, it is fully understood that "many" facts were needed to be able to carry out a comparative analysis (Glaser & Strauss, 2017, p. 35). In qualitative research, what is empirical has come to mean physical realities and their statistical representations, such as a number of classrooms. By constantly comparing the groups of students with and without special needs, the methods helped to draw the attention of the research to similarities and differences. This assisted in creating the concepts that drive the construction of categories and properties based on data analysis. Lammers et al. (2012) cautioned future researchers collecting data into affinity spaces, stating that affinity spaces present unique challenges to research boundaries when maintaining participant relationships. This is due to the open and responsive nature of an affinity space. In this study, a focus on emergence of categories solved this problem, in part, with regard to fit, relevance, forcing, and richness (Glaser & Strauss, 2017). This study took what Lammers et al. (2012) had to say seriously and examined and collected data related to various portals as they were expressed and lived by students. Each had its own culture.

Constant comparative analytical methods afforded the opportunity for a synthesis of categories and associating properties without relying on another theory's prescribed categories. This allowed for more generality in the study and allowed for data to develop in its meaning. This approach also lent itself to this type of study where, because it is a non-traditional area, there is little technical literature. Though this study made use of

grounded theory methods, Saldaña (2015) also offered an important counter-argument: that "pre-established sociological theories can inform, if not drive, the initial coding process itself" and that "the development of an original theory is not always a necessary outcome for qualitative research" (Saldaña, 2015, pp. 14–15). The data collection methods of this study are briefly described in Table 3 below.

Table 3

Data Collection Methods

Interview	Observations of Participants	Documents	Focus Group(s)
- Short (20–25 min.), independent, semi-structured interviews with each participant	- 3-4 brief (15–20 min.) observations of students in various "spaces" of the "CTE affinity space" (i.e., classroom, shop, clinic, internship, etc.)	- Field notes from observations conducted during the study - Student application data related to choice of CTE program - Student work products elicited but extant	- One focus group session was conducted

Interview Protocol

The phenomenological interview approach is "markedly" different in its intent (Manen, 2017, p. 30). The qualitative research interview is described by Creswell and Poth (2018, p. 164) as "attempts to understand the world from the subjects' point of view, to unfold the meaning of their experience, to uncover their lived world." During this research, this provided participants with an opportunity to discuss their experiences while keeping the questions open for possibilities. Manen (2017) discusses Husserl's work on

noeses. The noeses bring into being the consciousness of something. In and through the noeses, objects appear and are determined rationally. Husserl defined phenomenology as a descriptive philosophy of the essences of pure experiences. Students spoke routinely of a sense of belonging, the interest in the specific coursework of their CTE program, and how much their experiences contrasted with their past, what it meant for their present, and what it would mean for their future.

This researcher hoped that by asking the associated interview questions (see appendix), the response would be one that elicited what has been experienced, in terms of the phenomenon, and what contexts or situations have typically influenced or affected these experiences. This study sought high-context, explicit language where the participant was able to freely respond and complete their ideas. Language is part of practice and how people learn. Taking an analytic perspective that is described in the legitimate peripheral participation as it has occurred and been perceived by participants was a valuable lens in this research (Lave & Wenger, 1991).

Often, what is lacking in the classroom and, thus, what is challenging to capture in an observation format is explicit forms of talk (Gee, 2017). This does not mean to deny the external existence of the world that children live in but that the effort is to see things themselves as if for the first time. This only means that students often rely on the context and shared knowledge of their peers and do not elaborate on the events as they are experiencing them. This was true in this study, as well. In many ways, the etymology in the words they use has its origins in the context of the classroom it was born in— something only uniquely observed—and it does not seem to be routine, however. Put another way, if you miss it in its origin, you have probably missed it altogether.

Interviews were conducted using a semi-structured approach. This approach afforded the researcher the opportunity to create questions ahead of time (see appendix). This also aided in member checking, the triangulation phase of the study which, where employed, allowed for flexibility enough for the interviewee to define what the phenomenon was and encouraged the participant to have a hand in defining the structure without it being, or feeling, forced in any way (Charmaz, 2014; Lincoln & Guba, 1993).

Pre-Interviews

Interviews began with a brief social conversation that was aimed at creating a relaxed and trusting atmosphere. The hope in using this approach was that it would assist in creating a climate in which the research participant felt more comfortable in responding honestly and comprehensively. There was the potential for some concern because the primary researcher in this study is also an administrator at the site, so some students might feel reticent in their responses. Further, just simply being in the "principal's office" might give students the inherent feeling of being "in trouble." Fortunately, this did not seem to be the case during any of the interviews and may be the result of positive foundation-creating during the pre-interview process.

As will be reviewed in Chapter 4, interviews were truly informational and rich in their detail, as CTE students proved to be very self-reflective. They presented thoughts that were not necessarily expected and, thus, motivated follow-up and other clarifying questions. One reason for this may have been the result of explaining to research participants in advance that it was the wish of the researcher to understand the experience in the words of participants without imposing on it. Consequently, it was presented to participants that they may be asked for more detail in a response from time to time.

The process was intensive in nature, and practice made considerations of the ideas, guidelines, and concerns of the participants (Charmaz, 2014). This included the social, cultural, and economic conditions of any related situations and the assumptions and feelings of participants that might have implications therein.

Observations

Observation is the act of "noting a phenomenon in the field setting through the five senses of the observer" (Creswell & Poth, 2018, p. 166). The primary researcher in this study hoped, through a process of conducting multiple interviews with related documents in the form of student artifacts, observations, and a focus group, to learn about the experience of CTE students with and without special needs. This became increasingly clear in meaning. In this way, the researcher hoped to better understand what this particular learning experience is like for the students involved. Conducting observations provided the researcher with the ability to view participant motives, emotional responses, and unconscious behaviors when they are at play in the "here and now" of the classroom, shop, kitchen, and so on (Lincoln & Guba, 1993).

Learning is social, and in observing, the primary researcher in this study intended to look at learner membership in the class, their relationships, their trajectories, and related classroom practices. This study examined characteristics, such as those seen in Table 4 below, that exist in the communities of practice (Lave & Wenger, 1991), is an example of observation data collected. Usage in this study confirmed that it generated thoughtful and perceptive data. (For full observation protocol, see appendix).

Table 4

Example Finding from Observation Finding from Automotive Technology Observation

Descriptive Notes (including timestamp)	Reflective Notes (Experiential)	Emerging Themes/Initial Formulation of Categories	Examples
"At approx. 7:46, each student who volunteered to go to the SMART board was cheered on by their peers."	There was genuine applause, accolades, and general cheerleading for each student (by both staff and class as a whole) as they (each student) went to the SMART board to make a contribution.	Confidence from sharing knowledge and ability Sense of team	Overt and genuine student support for their peers.

Focus Group

To achieve a clear understanding of participant perception and related context, the primary researcher in this study conducted a focus group. This was an attempt to hear what Manen refers to as "real" talk (2017, p. 24). An element of specific interest here is that of academic language. Gee (2017) notes, with some dismay, that academic language is too often detached from the work of problem-solving. He likens it to handing a person a tool without showing her or him how to use it.

There is a specialist variety of language that exists in each CTE learning space. It exists as a means by which to do and understand things in these spaces. When it is detached, it is hard to model its use. When it is in use, it is incredibly powerful. The powerful social nature of CTE was indeed illustrated effectively through the emic nature

of the focus group methodology. This worked to triangulate much of what student-participants said during their interviews. As will be discussed, it revealed socially constructed phenomena which were, at times, difficult to grasp. The form that focus groups take allowed for multiple individuals to share the work of examining a complicated idea and fit well within the constant comparative method. Focus groups represent a space where individuals with similar backgrounds or experiences can share and communicate with each other.

The primary researcher in this study formed a focus group where participants were asked to reflect on their experiences and generate some dialogue around the semi-structured interview questions that were being used during interviews with student-participants. This focus group included teachers, guidance staff, and other members of the site's student support team (see corresponding Table 2). It should be noted that the primary researcher in this study also acts in the role of administrator at this site and, as such, did not actively participate in the focus group. The primary researcher simply put forth a set of questions from the interview protocol (see attached) for focus group participants to consider. The primary researcher fully understood that participants may decide that they wish to take the conversation in a different direction and, as will be presented and discussed, this did, at times, take place.

The focus group generated data that complemented much of what student-participants would speak to (see Chapter 4). In reviewing this data, it also helped to inform and clarify some of the interviews that were conducted afterward. This allowed for the competitive and empowering advantage that focus groups have inherently over other data collection methods, says Cyr (2019). Further, focus group participants were

empowered to create data through an emic approach, which worked to enhance validity and reliability of data analysis (Cyr, 2019, p. 3).

Conversely, the primary researcher in this study fully understood that individual responses are sometimes shaped by the very group environment that the focus group creates. That is to say that it was entirely possible that individuals would be influenced by the responses of others, in addition to the simple nature of having to speak in front of a group of people (Cyr, 2019). One reason for the decision of not having the principal researcher in this study actively participate in this focus group was an attempt to avoid this practice.

Another thought in using a focus group approach was, in part, to measure the phenomena to the extent that it is socially constructed. Additionally, there was a need to ensure that concepts were properly contextualized both within and across research settings. When student-participants (in this case, CTE students with and without special needs) feel connections with the beliefs and/or actions of other individuals working within career and technical education with whom they interact or observe, they may choose to identify as such.

Recruitment of focus group members were volunteers from an existing student support team at the site. This group shares a common identity in this way and held existing norms and goals for success of all learners. This is a group of stakeholders who regularly speak meaningfully about various aspects of the work of the research site and strategize on ways to support diverse learners at the site.

The moderator-participant of the focus group was the site's school social worker. The other two members were the site's guidance counselor and the site's special

education teacher. The guidance counselor works with all students from all CTE

programs. The special education teacher works with all students from all the CTE

programs, serving a push-in, small-group instruction model. The moderator was simply

instructed to keep participants on track in terms of the topic at hand. What constituted as

"off track" was widely defined so to encourage participants to bring in their own

experiences. The researcher was not present during the period of time that the focus

group was conducted.

The focus group was moderated by Rey, the school social worker. As stated, the

group reviewed interview questions to be used during the interview portion of data

collection, true to grounded theory methods, as interviews were in their initial stages at

this point.

Documents

In part, specific documents will supplement interviews and other means of data

collection (Creswell & Poth, 2018, p. 162). Further, the use of specific documents, such

as student work products, provides   context for the lived experience of the participants

in this study. The work students create in CTE can be empowering. It is reflective on a

deeper level. An important component of CTE is the growth students experience as they

move to the second year of the respective two-year CTE program of study. As will be

discussed in Chapter 4, what most students see as valuable in their CTE work are the

results. These can be long-term but often are what students speak to about a project that

they may be currently working on.

Career and technical education curricula are framed largely around these student

work products. The presentation of a student work product encapsulates the alignment of

curriculum, assessment, and instruction (Wiggins & McTighe, 2008). This includes planning in ways that work to impact all learners. Student work products were reviewed by the primary researcher with student participants in this study as a means by which to capture that impact from the perspectives of the participants. In this way, student work artifacts do more than simply act as containers (Charmaz, 2014).

Data Analysis Methods

This research utilized "In Vivo" coding during initial stages of coding. "In Vivo" coding, also referred to as "literal coding," is an approach where a researcher codes based on what is literally seen and heard in "real life." In Vivo codes derive from the actual language of the participant and are the first major stage of a grounded theory approach to data analysis (Saldaña, 2015, p. 77). It truly meets people where they are. Grounded theory is a qualitative research methodology where the purpose is to construct theory grounded in data (Corbin & Strauss, 2015). The Husserlian point of view, useful here, might be to state that anything that presents itself to consciousness is potentially of interest to phenomenology but needs grounding in the reflective practice of coding, such as that which is captured "In Vivo." In short, coding and analyzing a "basic social process" (Clarke, Friese, & Washburn, 2018, p.1).

In Vivo coding is particularly appropriate for beginning qualitative researchers. This type of coding also "honors the participant's voice," in this case high school-age children with and without special needs (Saldaña, 2015, p. 106). In Vivo coding enhanced and deepened the researcher's understanding and informed the findings of the research, both in practice and analysis. Ultimately this approach aided in the search to draw out noema, or that which is and has been experienced by the participants.

Process coding will also be of use in this study. The nature of career and technical education is action and application. It stands to reason that students will describe their lived experiences in this way. Process coding is a result of action combined with time and change, as well. While appropriate for most all qualitative studies, it is perhaps most appropriate for those that study the rhythms of interactions that exist when participants work to reach a goal or solve a problem. Though process coding largely studies phases, embedded within are concepts such as identity and other components aligned within Gee's theoretical framework (Saldaña, 2015).

Concept coding, also utilized during the data analysis phase during this study, assigns meaning to data. Saldaña (2015) stresses that concept coding serves phenomenological research and grounded theory well. This study applied such concept codes to processes and other emergent items that exist in the data. These processes revealed related themes in the data so to focus on theory development (Saldaña, 2015). For Glaser and Strauss, a finished grounded theory was meant to explain a process in new theoretical terms (Charmaz, 2014). It fully explains the properties of theoretical categories and demonstrates what motivated them to emerge.

Data Collection and Analysis Procedures

After approval from the University's Institutional Review Board, relevant persons and students who met the inclusion criteria were approached to participate in the study. After obtaining both district permission and informed, written consent, qualitative data was collected via interviews, observations, related documents, and focus groups.

By analyzing meaning, the "significance and relevance of experiences becomes intelligible" (Giorgi, 1971, p. 18). Therefore, analysis will be conducted on "meaning

units" that exist within the phenomenon. Detailed descriptions contained discussion and interpretation regarding what study participants have experienced and how they experienced it. To be sure, every perception counted and added something to a full understanding of the lived experience as it was perceived by both students with and without special needs and related staff. Analysis was done in an effort to develop "clusters of meaning" and to develop themes that helped this researcher understand participant experiences and the contextual environment (Creswell & Poth, 2018, p. 79). Simultaneous coding aided in developing themes within the data. Saldaña (2015, p. 6) defined simultaneous coding as "that which applies two or more codes within a single datum." This process was meant to search for coded data in an effort to categorize them by how they are grouped together, how an event might have occurred, how frequent or infrequent an event was, in what order they might have happened, or for causation.

The primary researcher in this study hoped to arrive at what is referred to as "textural descriptions" (Moustakas, 1994, p. 47; Walsh et al., 2015, p. 4). Textural description includes "thoughts, feelings, examples, ideas and situations that portray what comprises an experience." This researcher was conscious (and hoped) that the work being done would lead to a greater understanding of the meaning of the phenomenon and further hoped that it would compel decisionmakers to act thoughtfully when making future decisions concerning, among other things, programming of students with and without special needs.

Through comparative analysis (Glaser & Strauss, 2017), the primary researcher in this study employed both descriptive and values coding (because of its dramaturgical features) to discern differences and similarities that were found to exist between both

student groups (student with and without special needs). A cycle of coding is not a "fixed representation" but is a "dynamic and malleable process" where the priority is "insightful qualitative analytic discovery" (Saldaña, 2015, p. 9). Moreover, in conducting this research, the primary researcher in this study detailed relevant patterns and basic structures of cultural practices that included daily routines and occupational tasks, social interactions among students, and interactions between teachers and students. "By comparing where the facts are similar or different, we can generate or synthesize properties of categories that increase the categories' generality and explanatory power" (Glaser & Strauss, 2017, p. 24; Saldaña, 2015, p. 10). Perhaps Saldaña said it best: "If quantitative analysis calculates the mean then qualitative analysis calculates the meaning."

Memo writing was utilized procedurally in this study as a helpful way of scanning the text to get a sense of the data (Creswell & Poth, 2018). Memos were short notes about the key concepts in the transcripts. Memo writing helped to synthesize meaning, and it helped to document the thinking process of this researcher. Memo writing helped to track the development of codes and themes. Glaser and Strauss (2017) refer to this as the second rule of the constant comparative method. It is designed to access the initial thoughts of the analyst. This is an important part in generating theory, and in the work of this study, much of what was written about in memo form became a part of the study's findings and discussion (see Chapters 4 and 5).

Data Analysis after Collection of Data

The first step of phenomenological analysis is horizontalization. Data analysis began with this process. Expressions taken from interview data were not only coded but

were examined through two criteria. First, did the expression made by the participant contain a moment of the phenomenon? Second, is it possible to label it? The rest contained context and description. All data was of value in generating responses to the research questions for this study.

Through a data-driven process of horizontalization, the researcher balanced elements of both In Vivo and holistic coding methods to ensure that every statement had equal value. As will be presented in Chapter 4, this included a simultaneous approach with some degree of verbal exchange coding. There were nuances to how a participant spoke about their home school, their family, or the district that they travel from each day.

Codes were generated through the use of constant comparative analysis (Glaser & Strauss, 1965). Coding requires continual assessment and rethinking, and a large impact was the work of memo-writing (Jackson & Bazeley, 2019).

Holistic coding generated 46 codes, heuristically. Further, this was conducted without any provisional coding so to avoid collection of data that might otherwise arrive with any preconceived notions. The primary researcher opted to avoid any distortion of fact-finding even where Gee's theory was concerned.

Saturation was the goal until properties and a continuum were formed (Creswell & Poth, 2018). A central phenomenon and related themes were eventually established through specific properties generated from a process of In Vivo coding and memo-writing (Corbin & Strauss, 2015; Saldaña, 2015). This ultimately formed a structure that offers a theoretical explanation about the why and how of the phenomenon as it will be presented in Chapter 4.

Trustworthiness Strategies

Triangulation

Triangulation of data sources is utilized to establish credibility in a study and its value in related data. Triangulation was an obligation and priority of the researcher. Corroboration by using multiple types of data to "support or contradict" a given interpretation is important in a qualitative study and affords the researcher a level of confidence in conclusions that are generated (Creswell & Poth, 2018, p. 256). From interview to interview or where interview meets observation, there will be pieces of information that come to light that need to be verified by other sources. No single item of information was given serious consideration without being triangulated by some other datum (Lincoln & Guba, 1993).

There are alternate views of triangulation, where at its heart, triangulation is identified as practice (Mathison, 1988). Mathison (1988) warns against an assumption that just because different methods are used doesn't mean that all the puzzle pieces will automatically fit together. Instead, the discussion here is one where the researcher's ability to first acknowledge that different datasets offer different perspectives, and second, to explain why things might be different. In the end, this led to a stronger study with more credibility in the findings that are presented in Chapter 4. Though some research explores the assumptions that are inherent in triangulation, researchers generally agree that bias will be eliminated to a greater extent when, for example, different methods, investigators, and so on are used in conjunction with each other (Mathison, 1988). It is important for any researcher to understand that triangulation provides for a richer study but that it rarely reveals the clarity of a single view.

This researcher understood the need to maximize validity in this study. The intent was to regularly balance notes and emerging theories against data collected from interviews, focus groups, and observations. The question consistently being: Do other measures agree with the findings presented? To determine the clearest answer possible, the primary researcher in this study employed methodological triangulation as has been expressed. The desired goal was a deep understanding of the phenomenon. To that end, this researcher did not use triangulation as a means by which to connect the dots, but only to understand why those dots that did not connect did not, by evaluating inconsistencies and contradictions in the data. To guard against the elision of the two roles, the researcher was not the moderator during the focus group portion of data collection.

Research Ethics

The moral principles that will govern this study have been carefully constructed by its principal investigator. This foremost justifies the actions that were taken with regard to data collection. Ethics is always active in the mind of this researcher and remained so throughout the process of the research study as a way to enhance the integrity of the study (Lahman, 2018).

Considerations made when deciding how to go about recruitment of study participants, a population designated as vulnerable, were of the utmost importance and priority. For example, the questions the researcher asked had the potential to open up dialogue that may have been perceived as evaluative by student participants and teaching staff. Clarity was achieved by continuing along a path toward investigating the purpose of the study as it has been stated and as it will be restated throughout.

Students with special needs were participants in this study. An important
component always kept in mind with regard to students with disabilities that might be
asked is: Does this participant have the capacity to deliberate about and decide whether or
not to participate? This may be particularly true when working with students whose
disability is cognitive in nature.

<div align="center">**Researcher Role and Positionality**</div>

Creswell and Poth (2018, p. 260) present nine "strategies for validation in
qualitative research" that explore dynamics such as member checking, clarifying
researcher bias, triangulation, and others. The primary researcher in this study utilized
"bracketing" in this study as a means by which to ensure that the research focused on
"looking before judging" (Moustakas, 1994, p. 60). The primary researcher in this study
understood that one studies the perceptions of the participants, not those of the
researcher. Bracketing works to adequately explore, describe, and test human behavior
while at the same time preserving the "lived relationship" (Moustakas, 1994, p. 46). It
does so because the researcher brackets themselves out of the study by discussing
personal experiences with the phenomenon. It should be made clear that this is a
deliberate effort. Further, it is best to be explicit in our understandings, beliefs, biases,
assumptions, presuppositions, and theories (Manen, 2017). In this way, knowledge
produced from research is dependent upon and set in appropriate contexts.

This does not take the researcher completely out of the study, but it works to
make clear what experiences in the study the researcher personally identifies with.
Further, it follows the constructivist approach that eliminates the notion of a "neutral
observer and value-free expert." The constructivist approach treats research as

construction while acknowledging that it is constructed under specific conditions (Charmaz, 2014).

Perhaps, a good example of this lies in this researcher's own professional history. This researcher has been an educator for 15 years and a school leader in various capacities for about eight years. During this time, this researcher has conducted hundreds of classroom observations, both formal and informal in nature. Most of these experiences have been in the academic arena and specifically in social studies education. This researcher has great respect for good pedagogy and views it as something that progresses over time. The researcher has an equally great respect for the expertise of CTE teachers. That said, some CTE teachers, seeing CTE as only an extension of workplace development, identify themselves as "instructors" and in moments of pedagogical weakness will defer to statements such as: "I'm not really a teacher" or "I'm a carpenter." This may be a byproduct of the more practical but also narrowly focused goals and mission of traditional career and technical education (Jacobson, 2013).

Limitations

Giorgi (1971, p. 6) described several characteristics of the "scientific approach to the phenomena to be studied." The emphasis here is clear: the phenomena under investigation must be studied in such a way that the data cannot be influenced "by the idiosyncrasies of the experimenter." This is despite certain ontological presuppositions that exist. This researcher has prior experience at and knowledge of the site where the study was conducted. The process conducted by this researcher blended what is "imagined as present" with "the real." Unless the researcher remained strong in their

orientation to the research questions, they ran the risk of getting side-tracked or making speculations on their own opinions and preoccupations (Manen, 2017).

Moustakas (1994, pp. 46–47) states, "In phenomenological studies, the investigator abstains from making suppositions, focuses on a specific topic freshly and naively, constructs a question or problem to guide the study, and derives findings that will provide the basis for further research and reflection." In phenomenological science, a relationship always exists between the external perception of natural objects and internal perceptions, memories and judgements of the researcher. Further, while it is impossible to achieve complete phenomenological reduction, it is incredibly important to pursue it with extra vigor and remember that it is ok to humanize. The primary researcher in this study wanted to produce action-sensitive knowledge in this study and fully understood that for this to exist in the text, it must "animate and live in the human" conditions being studied (Manen, 2017, p. 21).

This is especially important when considering the flaws that are inherent in any phenomenological study. Moustakas cites Husserl when offering the following examples (Moustakas, 1994):

1. Even though a researcher can work diligently to set aside his or her own biases, the researcher is still rooted in their own ways of perceiving. In part, because a problem of language and habit still exist.

2. The self (the participant) is distorted and disguised and, at the very least, questionable.

3. One does not always see what one sees, even after many viewings (observations).

4. Human consciousness can distort perception.

Husserl (2013) states that everything that is naturally experienced should be subject to methodological criticism and the conceivability of doubt. The researcher of this study embraced the epoche process by using rigorous methods of data collection and analysis. Moustakas (1994) cites Husserl when stating that the epoche is freedom from supposition. It is a warning to stay alert and to be mindful of what is really there with clarity that leaves the researcher with only the phenomenon. This allows the phenomenon to be just what it is to the researcher because while the researcher undertakes and practices the epoche process, the researcher and his or her perceptions are still very much present. Should something influence or work to distort the researcher's perception of the phenomenon, a review of the researcher's current thoughts should occur. As discussed, bracketing through memoing is a good space in which to do this, as it helps to set aside biases and prejudgements and helps the researcher to return to a more authentic view of the phenomenon through phenomenological reduction. Moustakas (1994) reminds the phenomenological researcher to stay with the phenomenon. To let it be, and to view it from different points. This occurs through a modifying self-reflective process and also extends to the fact that the primary researcher is an authority figure at the site of the study. This sets the stage for a possible power imbalance that might work to bias the collection of data.

Generating a Rich, Thick Description

Generating rich description is an important quality in any qualitative research study. "Thick description" features "abundant, interconnected details" where details can

emerge through physical, movement, and activity descriptions (Creswell & Poth, 2018, p. 263). Every experience can be extended in a "chain of meanings and essences" with each experience containing openings for further experience (Moustakas, 1994, p. 55). Affinity spaces take work to sustain and can fall apart and degenerate for many different reasons. One reason may be that they cease to demand new and ongoing learning from everyone, no matter how expert, says Gee (2013b, p. 139). Capturing this will take eidetic means, and doing so may require asking the same questions that likely drove Husserl's work to achieve the greatest degree of certainty possible.

Qualitative research is asking: What is this phenomenon? In a phenomenological human science text, the answers should be found in a dialogic response (Manen, 2017). Manen (2017) warns, however, that a researcher must be cautious to not get so lost in the details that the text loses what it prepared to present. A rich study will explore not only convergence, but inconsistencies and contradictions, as well (Mathison, 1988). A good approach to this, particularly for a new qualitative researcher, is to employ descriptive coding because of its approach in documenting from rich field notes what participants experience (Saldaña, 2015).

Member Checking

Member checking is when a researcher seeks feedback from participants from which the data was collected (Creswell & Poth, 2018). This search for meaning and meaning-making is most fruitful when it is the product of study participants and researchers working together (Lincoln & Guba, 2013). In this study, this occurred both formally and informally (i.e., sometimes a short conversation in the hallway) and included taking conclusions drawn from the study back to participants in a collaborative

fashion so that they may assess them. This should occur twice with an intent to "assess intentionally" throughout the data collection process (Lincoln & Guba, 1993, p. 314). First, after phase 1 to ensure accuracy of initial data collected (most often occurring in this study) before the provisional write-up to ensure that conclusions are not based on erroneous data (occurring in concert with triangulation of data sources). The second check should take place after the provisional write-up (Lincoln & Guba, 1993). The importance of developing a report first is to establish where informational gaps might exist ahead of phase 3. This can help to direct how to proceed during the member check phases.

The researcher has several goals during this phase. The priority, however, is to obtain confirmation from the participants that the data reflects what was captured. Additionally, this provides time to extend and correct any inaccuracies that might exist in an effort to lend additional credibility to the study findings. Indeed, this is the most crucial step in establishing credibility, and while the researcher is not bound to accept all criticisms, he or she is bound to hear all of them and their meaning (Lincoln & Guba, 1993).

Clarifying Researcher Bias and Engaging in Reflexivity

Researcher biases, prejudices, and orientations have the potential to shape interpretation of data (Creswell & Poth, 2018, p. 261). Therefore, it is important for a qualitative researcher to "disclose their understanding about the biases, etc." that exist in the study. In this way, the reader can have an appropriate understanding of where the researcher is operating from in "undertaking the inquiry" (Creswell & Poth, 2018, p. 261). For example, the primary researcher in this study is an assistant principal at the site

in which this study was conducted. Additionally, this researcher has been a school administrator for over eight years and at two different sites. Commenting on past experiences related to those that might be captured in this study may be important to a reader, that they might have the opportunity to understand what might work to shape a given interpretation of events.

The aim of phenomenology is to transform lived experience into textual expression (Manen, 2016). The goal is for the reader to find life in their own experience with the text. For example, Manen (2016) describes how going for a bike ride, with no particular destination, can become the space for lived experiences that can then make specific associations going forward. Ensuring that that relationship represents what participants intended needs clarification, perhaps on more than one occasion and during more than one conversation. Manen (2016) provides an example where he asks whether the text represents the intentions of the reader-participant in terms of what it was actually meant. This involves a textual practice that Manen (2016) refers to as reflective writing. But the researcher also needs to be mindful and respectful of the experience. Phenomenology is very much a reflective process in this way. Manen (2016, p. 59) had already commented on this when he wrote of the living moment actually being pre-reflective in the sense that the "living" and the lived dimensions of lived experiences are the same but also do not coincide.

Prolonged Engagement in the Field

Adequate field experience allows the researcher to check for misinformation that has the potential to exist in any study. It is critical that a researcher familiarize themselves with the site and the participants in the sample in order to achieve a solid understanding

of what Moustakas (1994, p. 56) refers to as the "hyle." The hyle are experiences that we undergo when we see objects or features of objects that we perceive and includes associated sensations and feelings.

Peer Review

Peer review acts in an interrater reliability capacity (Creswell & Poth, 2018). As stated, the primary researcher in this study intends to engage with other collectors of data in this study to review initial meaning units. "Peers" should have special characteristics that are aligned with the goals of inquiry in the study (Lincoln & Guba, 1993). In this study, peers were colleagues (other administrators and guidance counselors) at the sites that were familiar with the phenomenon, some having far more experience with the subject but all ranging in their experience and variety. For example, programming at the site is conducted collaboratively with guidance and administrative staff, both at the building site and with guidance from the component districts.

An outcome of this initial review of datum will provide a look at what categories might already be emerging. Judgements are satisfactory and invited at this stage. Judgements of methods and interpretation show themselves as agreement, and judgement is meaning when grounded (Husserl, 2013). In general, it is helpful for the researcher in this study to ask of the methodology: "How do I know what I know or think I know?" (Creswell & Poth, 2018, p. 195). Often (and after the conclusion of the focus group), there was informal dialogue between the researcher and members of the focus group that presented interest and, inevitably, questions with regard to certain pathways in which the study was moving.

Conclusion

In summation, the purpose of this phenomenological qualitative study was to explore the extent to which a career and technical education (CTE) setting offers students with and without special needs what they need to be successfully engaged. It is acknowledged on the part of the primary investigator in this study that because of the researcher's involvement, the study is constructivist (Charmaz, 2014). Viewpoints will be shared and varied understandings will be interpreted and examined to determine certain origins of this phenomena. This will no doubt see participants become conscious of the experiences they have in CTE in a different way.

CHAPTER 4

Results

Introduction

This chapter presents the findings on the extent to which a career and technical education (CTE) setting offers students with and without special needs what they need to be successfully engaged, as measured by Gee's affinity spaces theory and as viewed from the perspectives of students. This chapter presents findings through the use of the following three research questions:

1. How, if at all, do student characteristics such as disability classification influence participation in a CTE program?

2. How does student preference for a specific CTE program influence participation in a CTE program?

3. What characteristics of a CTE setting influence student engagement in +experiences, which are defined as experiences that have three features: action, caring, and well-managed attention?

In order to address the research questions and explore them completely, the researcher conducted a qualitative study that utilized grounded theory methodology. This included interviews, corresponding student work products, observations, and a focus group. As a result, 20 students (11 without special needs; nine with special needs) were interviewed. Three observations (of cosmetology, automotive technology, and medical assisting) were conducted. Additionally, one focus group was conducted and included the site's guidance counselor, special education teacher, and school social worker. The

findings in this chapter reflect the qualitative results of this data collection and corresponding data analysis.

The themes that emerged from this study highlighted the complex but visibly rich learning opportunities that career and technical education offer to diverse learners. Findings present phenomena where students both with and without special needs have similar experiences. These include, for example, feelings of student empowerment that correlated to a sense of team where the outcomes, though varied, were a show of success for both students with and without special needs. As will be further presented, there were similarities that existed in both groups. Findings emphasized a type of learning that was social in nature, maintained a strong sense of team, and provided numerous pathways for students to take the lead toward their own learning goals while contributing to a climate that helped other members of the affinity space to do so, as well. Further, what was common to both comparison groups was that both comparative groups, students with and without special needs, recognized the strengths that existed in their peers. The central phenomenon in this study is that the strength in the CTE program was in the strength of the connections of its members (see Figures 6 and 7) and that these were perhaps the most important and impactful part of the experience for all learners. CTE students are not avoidant, passive learners. This was clear. A chief goal for them was striving to learn skills, not avoid failures, and that having the greatest possible awareness of the CTE judgement system can lead to successful results. CTE students are social, passionate learners.

Findings of RQ1

RQ1: How, if at all, do student characteristics such as disability classification influence participation in a CTE program?

Throughout data collection and analysis, there were several themes that emerged from the findings with respect to student participation in CTE. In general, students both with and without special needs shared contentment and satisfaction with what they were learning in their respective programs at the CTE center. Student and staff participants spoke to what aligns them in achieving a collective goal. Specifically, they spoke to their shared interest. That their interactions around a common endeavor are what worked to produce successful performance and engagement for virtually all members of a given CTE learning space, including the teacher.

There were some findings that were specific to this study's comparison groups. These are disaggregated below for students with and without special needs, where noted. CTE students participate without competing for status. As will be shown, the work of specific programs, such as police science or medical assisting, ask that students work inherently and energetically together.

Findings of RQ1 Across Comparison Groups

Sense of team. One finding that emerged from this study was the sense of team that frequently existed in student interview testimony. When students discussed this, it seemed to include the idea that their CTE program is like a family. Some students even referred to their class as "family." Eunice, a general education student and a junior in the computer animation class, explained that some friends from her sending high school, who

also have an interest in art, said that they were going to apply for computer animation at the site and encouraged her to, as well.

Jimmy, a medical assisting student without special needs, had stated that before medical assisting, "school was not my priority. I wasn't interested because I didn't know where it was taking me." He attributes a lot of his success in the program to the encouragement and coaching of his teacher and said that she has been a big part of what's motivated him to reach his full potential. Jimmy is now an engaged learner who participates routinely. Nidhi, a medical assisting student without special needs, described the same teacher as a leader and spoke of her as someone who "helps guide others." This was similar to how Sully, an automotive technology student without special needs, described his teacher as well, saying that he is "a good guy."

Cecelia, a cosmetology student without special needs, described herself as a visual learner. She discussed how she first became aware of the class by being encouraged to try the program by her mother and her aunt, the latter a cosmetologist. Like Jimmy, Cecelia describes a social dynamic that contributes to success in the program for all students. This was complemented by focus group data that found this to be more likely to exist where the CTE teacher is consistent. Marie, the school's guidance counselor stated, for example, that electrical, a class that dealt with some staffing issues during this school year, did not "have an identity." Madison, a construction electricity student without special needs, spoke about a lack of cohesiveness. Cecelia spoke of a culture where "everybody really just makes sure everyone's doing the right thing and there's always someone there for someone else. I have been in that position like three times where people ask me for help." When discussing the challenges that can sometimes

exist in the program, Finn, an automotive technology student without special needs, described that while things can be challenging from time to time, "we work as a group so it is pretty easy to figure out." When asked to elaborate on the group dynamic a bit more, Finn discussed an even playing field for all students in terms of what they know:

> Yeah because, like, it's good because, like, we have, like, five people in the group but we switch up groups. It gives you an idea of working with different people and how you're going to react to it. So, I mean overall it's pretty good because this gives a situation where if you don't know something, you can ask them and they show you how to do it. At my home school, the only way for you to get help is by going through the teacher, but in this program [at the CTE center] you can go to, like, a student first, and if they don't know you can go to the teacher. Here, everyone is learning the same thing and they all have the same background.

During an observation of an automotive technology class, it was as though the teacher was both a participant in learning and the facilitator of instruction. Characteristics of the lesson encapsulated many of the same elements that Jimmy (and others) referred to when describing the important social composition of his medical assisting class. Most notable (and visible) was the genuine applause by all students as each of their peers completed the work on their own after the teacher had modeled how to do it properly.

Leona, a cosmetology student without special needs, explained that her interest in cosmetology began with the fact that her mother is "one of the best hairdressers." Leona continued to tell of how her grandmother was "so happy" that she enrolled in the program. Her grandmother even comes in for client services. Client services is a work-

based learning opportunity whereby the public is invited in to have their hair done and other treatments by students as a means by which to practice on an authentic audience.

Tucker, an automotive technology student without special needs, described how much of a help her teacher is to her and her peers. She shared that she used to have resource room but dropped everything, confidently stating: "If I have a question, I'll ask." She further explained: "You have time here if you need it. I think more than you would at your home school. You can't get help from someone else, like I can't go home saying, 'Mom, can you help me with auto?'"

Tucker's CTE experience reveals that the environment fosters independence. Her story traces that of a developing learner. Though originally interested in being a carpenter, Madison, a general education student, was guided to the construction electricity program at the city center by his father, a carpenter.

Like Jimmy, Betty, a senior with special needs, also described the importance of a presentation by a CTE staff member at the CTE site while she was a sophomore at her home high school. Betty described that what she likes most about the class is that "it's like another family." When asked if she could elaborate a bit more on what she meant by "family," Betty stated "pretty much all of us have different skills and different personalities and qualities" and that "we all come together in the kitchen and we're able to make it work and create some pretty great things."

This was similar to the statement made by a general education cosmetology student, Natasha:

I like all. It makes me feel like I'm doing something always. And since it's something I want to do with my life, it's different than like normal school. I feel

like I'm moving forward and I feel like everyone in my class is really, like, helps

each other. I feel it's like a little family.

For Natasha, the nature of family was an important factor in how she and her

peers approached challenges.

Interest in CTE and importance of family. Another finding during data

collection and analysis was the power of shared interest and how it made students feel

comfortable enough to participate and engage, no matter what their classification. That

was their identity and the only one that was needed.

Luke suggested that the class brings out his "appeal." That, at certain times, he

was "down" and kept to himself prior to enrolling in the computer animation program

and associated this new representation of himself with the program content. He equated a

"good day" with getting work done. A "bad day" was when work could not be done as a

result of, for example, some technological issue.

Ricky, a general education student in the site's automotive technology program,

described wanting to "learn all he can" from the program. Immediately, in describing

how he learns best, he, unintentionally, took a somewhat passive-aggressive posture

toward the traditional learning environment, saying:

Like, for example, today we were going over springs and instead of just handing

us a packet, you're going to grab the spring and show us like, you know, pointing

at different parts, and that just helps me get a better understanding.

Ricky was clear that certain elements of the curriculum challenge him more than others. He noted drum brakes, for example. And he was more pointed in his critique of traditional schooling when discussing how he approaches challenges, saying:

When I have a challenge here, I find it a lot more interesting than the challenges I have at the home school. Like, say I don't understand a certain component of a car, you know, I'll actually be interested to go home and look it up, you know, watch videos on it.

We enjoyed an interesting conversation about the difference in learning environments after that. Ricky playfully made a comparison to "chemical bonding" and described that even if he did not understand it, he would be less "inclined to spend the time at home looking it up...no offense to science." As noted in Chapter 2, one study stated that, at the CTE center, teachers looked for "what they did right while at the home school teachers looked for what they did wrong" (Gentry et al., 2008, p. 5). Findings demonstrate a routine contrast between participant perception of experiences at their respective home schools and their experiences at the CTE center.

For Ricky, what it seemed to boil down to was that a "good day" was "learning something new." He said, "Doing something that I have never done before...which is almost every day." The difference (and perhaps it's not too different) at his home school is that a "good day" is "understanding something." Jimmy described becoming interested when the teacher from the program came and visited his 10th-grade science class. He explained being particularly interested in the certifications that came with successful participation. He explained the profound impact the visit by this teacher had when saying that he never knew what he wanted to do after high school until she came into his science

class. This was sort of a wild pivot for a student who just admitted of a plan to buy a Volkswagen bus to drive to, and live in, California. This plan was prior to becoming interested in the medical assisting program at the CTE site, said Jimmy. Cecelia, like many of the other CTE students, was very reflective. She openly admitted, "I'm better in some things than others." A "good day" and a "bad day" is very much driven by the work itself. Cecelia stated that a good day is having fun with her friends in the salon. A bad day is associated with some frustration around the work. Specifically, she stated: "My bad day would be getting frustrated with something that I can't do and then making that ruin the rest of my day."

When pressed for an example, Cecelia stated that sometimes she can get frustrated about practicing for the state board examination. She went on to describe it in a way that revealed some anxiety related to the high-stakes nature of achieving a passing grade on this assessment and what that means for her future. This is one of her many goals. When the focus group discussed this, it presented, at times, with some emotions. The school social worker shared with pride how one cosmetology student in particular had completely turned herself around during this school year. Rey stated:

> And I think we see that. There's, like, one student I think about in cosmetology who she came out at the beginning of the year, like very traumatized, really rough past, like, almost, you know, we were concerned she wouldn't make it. And she just got in there, and all of a sudden it's like, wow, that girl knows how to do hair, and she becomes the leader in her class where she never was probably a leader ever in entire life, let alone in a classroom, a student who probably was just, you

know, she has a learning disability and she's probably just pulling passing grades, and all of a sudden she's a leader here because of her abilities.

Specifically, Finn stated: "I don't know. I like more of a hands-on experience because I'm not exactly like the best with written stuff. I guess like the hands-on part of it is best."

Natasha, a general education student and another future cosmetologist, is new to the area. She is originally from out of state and moved just prior to the start of this school year, 2019–2020. She stated she was scheduled to go to a CTE school in her prior state and was relieved that there was this option available to her here. She described it as somewhat of a refuge in a way. A visual learner who learns best when able to see how things are modeled and demonstrated, Natasha spoke about how important the supportive environment of her class was in terms of how she approaches challenge.

Student leadership. Student leadership was present throughout the findings. It was clear that this was both a support for peers and that it fueled participation. Like other students with special needs, perception of leadership seemed to be based around the more practical and logistic needs of program participation and students themselves. Zeus, a construction electricity student with special needs, described that there are team leaders "in every cubicle." He stated:

Well actually, the leadership incorporates a lot in our class because we'll have a cubicle where we'll have one guy in charge of putting all the plans together and kind of making a blueprint of everything, and then we'll have the three other guys get the materials or start wiring up stuff...start cutting up the pipes and stuff to go into.

Zeus described student leadership as that which mobilized others. This could be toward the successful completion of a project goal in the shop. Student leadership in construction electricity is rooted in evidence-based outcomes. Put another way, it is results-oriented in a way that is more pointed than what participants in other programs shared, though, in general, the setting of CTE is meant to address skills like problem-solving and teamwork (Dougherty, 2016). Students apply their skills where and when it will accomplish the goals of the group. Student leadership in construction electricity is structured and not organic like that of automotive technology and presents each student with an opportunity to be a "foreman" on a job site.

Elaine, an automotive technology student with special needs, described herself as sometimes "stubborn." The impression on the part of this researcher was she felt she owed it to herself to work hard and persist past challenges. She said she tries to "conquer" things on her own. When it is needed, she is more likely to ask for help at the CTE center than at her home school, and when it came to degrees of personal success, her automotive technology class could have "ups and downs." Elaine also commented on the fact that she had an IEP. She stated that it is helpful to have her tests read to her, saying:

> It helps me a little bit and it kind of feels like it actually makes me have a higher (grade)...if I read them myself, I feel like I have a higher chance of failing because usually when I read tests myself, I have failed in the past, so I feel like getting my tests read is better.

Elaine is not completely sure what she wants to do after high school yet. She discussed community college but was not sure. When asked about leadership in her class, Elaine spoke about inclusion and had the following to say:

Class leadership looks like someone that tries to help someone else in the way they see best fitted and when they try their best to have them not be singled out and isolated from the rest of the people...there's that person in the corner and someone tries to help them out when no one else would.

Like Betty, a culinary arts student with special needs, Elaine emotionally recounted that she just wants to try her best. She explained:

Also, I just want to try my best to not just put my pen down and say, "Look, I give up" and put my hands up and give up because I don't want to be like that. I was like that before and I don't want to go back to it, being more open-minded and stuff, not so close-minded as I was in the past. I am pretty satisfied with what I have become. Like in 9th and 10th grade I wasn't really so open And I was rude, I was really closed off. I considered myself social because I like, you know, I like making a lot of friends. And I was socializing with people, but when it came to my mindset, you know, I had more of a closed mind, so I didn't really have a lot of growth, so I just thought of things negatively rather than positively.

Some of the challenges that Elaine had to overcome included feedback from family. Her CTE experiences helped her better understand her weaknesses and recognize where specific things might need greater attention. With a degree of poetic license, she explained further how she found her strength, saying:

My dad thought me going into automotive was just a piece of baloney, and he didn't think that, you know, he didn't realize that it was my type because he is my dad, knows me a lot. He didn't really think that it was best suited for me, but I

was getting into cars at home and wanted to know more, so that's why I ended up trying to get into automotive. He was like, "You don't want to do this." So, for the first couple of days it was a bumpy road, but I ended up scraping myself off and ended up walking and running.

Elaine has a commitment to herself that, in some ways, differed initially from the more collegial presentation from other participants. Not that it lacked humility in any way, but in Elaine's reflection of her experiences, there was some perseveration of the challenges she has come across. Her strengths had to be understood in the same way that she had come to understand her weaknesses. The automotive technology program helped her to recognize both.

Like many other students have shared, Alice spoke of the social capital of her peers. She stated:

We all create something together. So, like, we as a class, we like working together to get all our opinions together...there never really has been a "bad day" because if someone doesn't understand something we all, like, help each other to understand.

Tony, an automotive technology student without special needs, stated that he "loved" the program and spoke to how he had made friends in the program. That they are a cohesive group that faced things together. When asked about leadership, Alice spoke to the qualities that are associated with this in her class. It was social in nature: "Leadership is having good ideas like expressing how we all feel, listening to each other, and taking into consideration other people's thoughts."

Tucker, a female student with special needs in the site's automotive technology program, followed a similar tone to that of which Elaine spoke. Tucker was originally in the cosmetology program at the site. Some of her motivation for why she decided to switch was interesting:

Well yeah...I mean I really liked it because I liked the idea that I was going to be open a salon up within the mall or something at that point. There's way more to cosmetology than that...and then the looks and everything that you get from the guys. Oh, "cosmo girl, cosmo girl." I was never one of those girly-girls so it was really weird for me. So, I want to check out another class because I didn't even know it existed really. So, once I saw auto, I'm like, this is something I want to learn. So no one ever talks down to me again and I know what I'm doing when I get my own car.

There was a lot to unpack during this interview. First, the "girly-girl" comment, which Tucker actually said she "hesitates" to explain but that "I should know" what she meant. She did, however, go on to describe:

I wouldn't wear makeup. I wouldn't learn to do the makeup that most of the girls in the class would learn. I can't braid for my life. That's was the first time that we tried in class, and then from that point, I kind of realized I don't have a handle on this right. But the whole wearing skirts and hair and makeup at sleepovers...I'd rather stay up late and watch you like a scary movie kind of thing.

The guidance counselor helped Tucker by arranging for her to spend some time in the automotive technology class, and though there was some initial hesitation, she felt it

afforded her the opportunity she was looking for in a CTE program. Tucker has strong feelings about the gender dynamic that exists in this industry:

> Personally, as a female learning about cars prevents when I go to buy my own car dealership or I go to get something fixed that. "Oh, dude where's your husband, where's your boyfriend." The kind of situation that they can talk to me and I know what I'm talking about.

She admitted that she has never actually had an experience like this but understands that there are stereotypes that sometimes exist. She agreed that some of her interest in the program stems from a desire to break a glass ceiling and be part of a vanguard. Tucker stated:

> Well I've always thought there was since I got in the class, but that's a part of this generation...that girls are like...you know...about gender equality and all that feminist stuff that is going now, and that's important stuff. So, I mean some people go extremely overboard with it.

Tucker seems to recognize a role she may play, to some extent, in a nontraditional field, though she does seem to distance herself from those who might go "overboard." When further explored, she shared:

> I mean, there are times that there are. I mean, you know, stuff that just annoys me here and there. Yeah, I've mentioned it to the teacher aide too, but she's a mom...so she doesn't see it the way I see it. OK. Because once you become a mom it's like oh, they're just looking out for you. Yeah, well, when it's working

with others it's, it's a process because we all have different personalities. So, to

get along and to get well, we have to get done and take a little longer, which is

normal, once if we were in a group, to do one project and then we had another

project afterwards in the same group. I'll probably get it done faster because we

got a chance learning how each other works right by. If I were working on my

own, like I did once or twice last year because I still didn't know how to work

with the guys, I got it done pretty fast because I couldn't handle not having a

project done at the end of the week. I mean, it had a certain time limit for myself.

Going to two weeks was a little ridiculous, like come on, that should be done.

In her own way, Tucker speaks of growth. She is describing a struggle, but there

is an undertone of pride in the way she described it. This mindset, illustrated by many

other CTE students, is what produces learning and success through personal growth.

Tucker took control of her situation when she felt misprogrammed in cosmetology and

sought out a better fit for herself in automotive technology, even though she understood

there would be inherent challenges and possible gender biases. She saw her situation as

an opportunity to learn more about a topic she *was* interested in.

Findings of RQ1 Specific to CTE Students with Special Needs

Horizontal learning. Alice spoke to the merits of repetition in the skills that she

was learning and how she retained and built confidence in the work. For Alice, showing

fallibility was crucial to her ultimate success. She was proud of this. Alice spoke with

pride about how she had to work at things that, in truth, are not intuitive in nature.

Teachers can differentiate when they have a clear understanding of and can

anticipate patterns of students' actions. Teachers can also assess student progress based

on a larger sample size, as students have more practice at learning and routinizing a skill where a teacher is there to support them. Luke is a student with special needs in the site's computer animation program. He described his interest in the program:

I'm in animation because I was mainly just, like, sort of experimenting and sort of, like, figure out what I want to do. And one of those things I sort of just, like, always had since I was a kid is that artistic ability...but never really went upon expanding it. And as I was, like, looking at different ways to expand it, cause my high school. It's good on what they give, but I feel like it's not enough where the time restraints and just sort of the rigid structure is, like, a little too suffocating for me. It's very, very free...where you can let your imagination roam and just put your ideas into action, which I love so much about this place that just, like, lets you expand on your abilities.

Luke describes himself (like so many others) as a "hands-on person." That this is how he learns best. He spoke specifically about how he likes SkillsUSA and its related competitions. That it helps to "test us so we can go above and beyond" and that, in general, the program is challenging but rewarding. He compared the environment to that of his sending high school:

It is very different because at [the home school], I feel like, again, it just, like, you go through a rigid structure where it's just like, oh, you test this, test that. If it doesn't work, then you go with this test that doesn't work. And then eventually down the line you get an answer. When we are here...it's sort of like a tree where you start off basic, but then you've got to sort of maneuver in what path you want

to take in order to get your best project, to sort of see your vision of what you

want for that project.

Zeus, a student with special needs in the construction electricity program,
described a fondness for the program. He is in his first year of the program. This is
important because first-year students (juniors) had more consistency in staffing than did
the seniors (in their second year of the program). Like others, Zeus described himself as a
visual, hands-on learner and described that the program does challenges him sometimes,
saying: "yes and no." Zeus had interesting comments about how he approaches
challenges:

> I would say here, I'd probably be able to write it out more and I'd have more time
> to figure out a game plan to how I would, how I would go at it. And then at school
> it's more of a, it's more of a look back at notes really quick or, you know, try to,
> try to read something inside my notes or the textbook. I feel like I have more time
> here to figure things out than at my home school.

Like many others, he states: "...and then at school..." As stated, many students
mean only their sending, "home" high school when they refer to "school." Here, it is hard
not to compare an analogy that Marie (the school's guidance counselor) made during the
focus group about "sneaking vegetables into a child's mac and cheese" when she
discussed how math and English are integrated into a student's respective CTE program.
When further explored, Zeus shared the following:

> So, the time that we have here, I think, is better even though it's, like, a shorter
> span of time. I feel like I'm almost learning more here because of the fact that

everything can be broken down more simply. And it's one class with this amount

of time, which is more than almost, like, you know, two periods of two classes

together. So, I think that it's a lot, it's a lot easier to learn something. I can stay on

the task longer, so my mind is more focused on it instead of thinking about the

next classes that are coming off are the past classes. It's easier to stay on task

because once I'm here, I'm, like, in (CTE) mode and, you know, that makes

everything a lot easier.

He was also very proud of the work he has done to create projects in class, saying:

Yes. So one of the projects that we had to do was we had to wire a three-way

switch, which would be used if you have a light upstairs in the hallway upstairs

right at the top of the stairs. You have a switch kind of on the stairs, like on the

stairway. And then one in the hallway to control that one light. So I remember I

actually struggled with this one, but eventually when I got it down, it was like I

can't, I couldn't forget it.

Like Alice, Zeus speaks to the value of being able to practice a skill until he

develops a routine for how to do it. Eventually, "I couldn't forget it," said Zeus.

Zeus stated that he makes regular use of his time and a half requirement that is

mandated in his 504 plan. He stated that he does not feel he needs it as much here as he

does at his sending high school, however. As presented in Chapter 2, White (2015) writes

similarly on how to engage students with special needs using simulated experiences as a

student with psychomotor or other difficulties such as blindness. Zeus was excited about

being able to acquire both OSHA 10 and OSHA 30 certifications. OSHA stands for

Occupational Safety and Health Administration. Holding an OSHA 10 or OSHA 30 card presents that you have successfully completed a 10-hour or 30-hour training, respectively, on "how to keep you and your employees safer from potential accidents. It can also help you spot hazards in your building and improve the current safety levels of the building and its equipment" (United States Department of Labor, n.d.). Typically, holding an OSHA 10 is a satisfactory requirement for an entry-level position where, by contrast, an OSHA 30 card will present what may be needed for a site supervisor or manager role.

Findings of RQ2

RQ2: How does student preference for a specific CTE program influence participation in a CTE?

Specific CTE program content is a pathway toward accessing a judgement system (see Figure 6). As defined in Chapter 1 and elsewhere, a judgement system, says Gee (2017), includes values, norms, and the ways members of an affinity space engage in practices that are specific to the spaces. CTE judgement systems can vary in scope and in so doing provide the very "portals" that Gee often writes about. This can be, for example, respective of program content. Preference for a specific CTE program mattered for some participants more strongly than others. Where the specific CTE program preference mattered, participants understood and operated within a specific judgement system aligned with specific content goals. There were students to whom specific CTE program preference mattered less. These students even made dramatic changes in placement. For example, Elaine moved from medical assisting to automotive technology. For Elaine, the judgement system that exists within the greater environment of career and technical

education and all of its features was most important to her and was thus where she preferred to operate. The latter, like Elaine, was more present in the findings from students with special needs.

All students, however, want their teachers to help them develop their interests. At times, such as in this study, this is a measure by which some assess relationships in an affinity space and would include the relationship between a teacher and a student (Smith et al., 2015). There are findings in this study to support that this is also a measure of the relationship between students.

As will be presented, virtually all students spoke of the stressful nature of learning at their home schools. Taken with Gee's notion of judgement systems, students often spoke of what they perceived to be a very specific judgement system. And one that they did not quite understand. Students speak to systems at their home schools that either force or incentivize a change but do not teach students the reason for the change itself.

Findings of RQ2 Across Both Comparison Groups

School. Eunice, a computer animation student without special needs, is happy with her decision to enroll in the computer animation program "because it's better to start the day off being able to do something other than going to school." Like many other student participants in this study, Eunice referred to her sending home high school as "school." In reference to this, she said, "Over there is just the teacher tells you exactly what you need to do and you can't really go outside of the box or anything."

Ricky, an automotive technology student without special needs, plans to join the United States Marine Corps after he goes to a four-year college. He wants to use what he has learned at the CTE center and do something in the engineering field. He likes

working "with his hands" and talked a lot about how excited he was to earn certifications in certain elements of the trade. He said that he was "surprised" that that was something available to him here. He described that being enrolled in the automotive technology program had provided for him a better work ethic. Like Betty, a culinary arts student with special needs, will report, he described his CTE experience as an incentive, saying:

> You know I think it actually gives me a slightly better work ethic, considering I get to come here for the first three periods of the day and sort of enjoy my time, and then I go back to [my home high school] ready to buckle down and just focus on that kind of thing...when I had electives there, it would give me too much time to like slack off. It's interesting.

Like many other students reported, a "good day" was more time "in the shop" (or salon or kitchen) and a "bad day" was varied descriptions of a more traditional classroom learning environment. Ricky took this a step further, however. He reported that a "bad day" might also be if "we've been working on the same thing for, like, three days and can't figure it out."

Finn, an automotive technology student without special needs, talked about not really "being a school person." A junior who attends in the morning session, he said that the CTE program in automotive made the mornings "easier." That it even made work at the home high school "more enjoyable." He discusses being particularly proud of changing the rotors and calipers during a recent unit on brakes. Further reminiscing, he stated that it was "the first time we actually got into the car."

Leona described that most days are "good days" and that "bad days" are really only those that are the result of things "I get very stressed about...a test or something."

Anxiety over traditional testing was a common finding among students. In fact, when students referred to tests, they were only referring to a traditional test and not a practical CTE assessment. This was similar to the manner in which students referred to their sending or "home" high school as "school," implying that the CTE center was not. Ultimately, Leona sought certain goals for herself, such as being a "better colorist" and being able to successfully perform a 90-degree haircut.

Natasha, a cosmetology student without special needs, described what was lacking at her sending high school where she takes, for example, social studies, English, and math. She said:

> It's more a challenge that you have to get through and, like, you know that you should. There's so many more people that can help you here [the CTE center] because it's a smaller class. Your teacher is always there and your classmates are doing the same thing always. But in [home school], it's a totally different aspect where it's, like, information. And the teachers are so, like, focused on getting what they need to do instead of helping you.

Like other students, Betty, a culinary arts student with special needs, also made comparisons to her home high school. When asked if she approached a challenge differently at the CTE center than she would at her home high school, Betty stated that "she is more comfortable going about solving it here [the CTE center] and that's because I'm more comfortable here and in this environment." Further, Betty described:

> At my home school it's more, you know, every day in the books, sit still, write it down, read it, answer questions and here [the CTE center]—it's hands-on work.

We are able to, you know, be doing something different and I'm never bored ever when I'm here.

It was interesting to hear Betty comment on the CTE instructional program versus the academic integration that was incorporated into her culinary class. When asked what a "good day" would be, Betty quickly stated: "Walking in and everyone has their uniforms in full, we start our lesson quick, we get our recipes, we go straight into the kitchen, and we make something."

Conversely, for Betty, a "bad day" was simply "a Friday, because we have math and English and do not get the same amount of time in the kitchen." Betty went on to describe how cooking is "my thing" and that she plans to continue "my culinary arts" after high school. She expressed that is she is trying to determine whether or not she wants to be a chef and own her own business or if she wants to do something more on the hospitality or business side of the industry. This generated some conversation around program culture. Polly, a special education teacher at the school, stated:

I think that's really interesting because I also think that, you know, like, what you're speaking to is that there's a culture within every program. I think the computer animation kids tend to be more introverted and tend to be very focused, and they tend to not like to socialize. While the auto kids tend to be a little rougher around the edges for sure. And then I think the electrical kids really, I mean, both auto and electrical like to be handy, but there's just, like, a different culture in the electrical room, like they're a little bit more, like, they really like to think about things and problem-solving and in that in that class.

Marie, the school's one and only guidance counselor, agreed and was a little more direct, suggesting:

So, I think there's definitely a culture in each program. Well I know you [responding to Polly] feel that because our electric teacher has not been consistent, and the culture of electric is probably not as strong or as developed as the auto classes, who have had the same consistent teacher for two years. Electrical doesn't have an identity.

Related to this, Rey provided an example where, though the CTE center has two different automotive technology classes, you can "almost tell which kids are in which class." Further, the social worker agreed with the guidance counselor's point about the construction electricity class not having an identity, saying: "It hasn't been cultivated." Talk about the construction electricity class continued and was specific to question #13 in the semi-structured interview protocol (see appendix), which asked, "What does leadership look like in your program?" Marie shared:

There may be a student that they identify with as the kid who was the leader in their class because they don't really have a teacher. They've had numerous teachers, some with electrical experience, some without. So, I don't know that they would consider their teachers. Maybe a little more in the AM, but PM, I'm thinking I don't know that they would necessarily draw a leader from their teachers.

This is not to suggest that students do not continue their integrated academic coursework, where both ELA and math teachers push-in to their CTE class, but it says

something about the urgency that three staff members come right out of the gate describing what the lack of a critical classroom staff member, in this case, the CTE teacher, can look and feel like for students and related staff members. Its greatest impact, of course, felt by students.

An important note here is that CTE students are not permitted in the practical spaces, such as a shop or kitchen, without the supervision of a licensed trade expert. This means that they are not able to perform hands-on work that so many of them have described during interviews to be their preferred learning style. This is difficult on one day, when a session lasts for about two and a half hours, let alone for any longer-term stretch. This can make students understandably impatient and frustrated and makes the experience for any new teacher entering the classroom, without formal training, that much more challenging and difficult. The guidance counselor, Marie, commented on this:

> So, yes they are so eager to learn, and they can smoke out right away when someone is authentic with them and when they're not...when they're not learning. Each class is very different, and that is cultivated a lot by the teacher and the aide [TA/Teacher Aide] in that class. But it's also like you [Polly] said of the nature of the class. Computer animation, those kids are introverted; that is a solo career for the most part. Yes, you will work in teams sometimes, but when you go into that class, their "hands-on" is independent. They are at a computer. You go into auto and there's five kids changing a tire. You go into medical assisting, it's usually two or three working together. It's a group effort. That is a very unique course [computer animation].

This conversation went further into cohesiveness and how most students wear uniforms each day. Marie stated:

When you look at it, I feel the kids here are much better prepared for that piece [the wearing of uniforms]. Cosmo wears scrubs and that's really getting them ready for the workplace, you know. Computer animation doesn't have a uniform, but there's, you know, there's that that artsy look...that, you know, that theme, that program, that culture has created, but culinary has, you know, has their aprons and their chef coats, and medical has scrubs, and cosmo has scrubs, and auto has their...you know...their identifying T-shirt on with it, with the course or the teacher's name or their name on it. Yeah, there isn't much, like, I don't think that there's much, like, "transfer me," like, if you're an auto. You don't want to do electric if you're an auto kid...you don't want to do computer animation.

Jimmy stated that before medical assisting, "School was not my priority. I wasn't interested because I didn't know where it was taking me."

Betty described her membership in CTE as having a powerful impact on her as a student. She stated: "I definitely go to school more often now that I'm involved with this program because, you know, you can't really miss half the day and then come here [the CTE center] because it's either in the morning or afternoon."

It has also made Betty conscious of her academics in a way that she had not been before enrolling in a CTE program. She commented that:

It also made me want to do better in school because doing good in one part of your day and not doing good in the other part of your day is, like, not the best

feeling, so doing well in school and doing well at your CTE program should be the same thing.

When asked to elaborate on "going to school more often," Betty stated:

Because it was kind of just, like, boring and sitting there and just not being able to, like, do anything...it was also something that I enjoy and get to do, so I would want to come here...and I would want to, you know, it would be like my treat...an incentive for going to school.

Findings of RQ2 Specific to CTE Students with Special Needs

Proving oneself as most important. Proving oneself was more important to students with special needs than preference of CTE program. Betty was excited to describe what it was like to create something in her culinary program. Saying, "Oh, it's awesome. It's probably, like, our way of showing that we know what we're doing." She described that it showed her skill level and that she was knowledgeable. Betty made specific reference to a recent project in her class where they made homemade gingerbread houses (Figure 1 below), and she also said her favorite thing to make is chicken cordon bleu.

Unlike some of the other participants, Alice didn't have much to say about her sending high school. She did comment that persisting past challenges that she experienced at the CTE site made her more confident that she could "handle it the same way in my home school." Her plans are to continue on this path into postsecondary education and thereafter join the armed forces or law enforcement. "This program helps me to do that."

Elaine, an automotive technology student with special needs, had an interesting journey through career and technical education. She began her time at the CTE center in

Figure 1. Betty's homemade gingerbread house.

the medical assisting program. She talked about her experience in the medical assisting program:

It was pretty hard for me....and I thought that I wanted to become a veterinarian because I always wanted to do that as a little kid. I always liked animals and so forth. Then I explored automotive and I ended up liking that program better. I thought I knew a lot about it [Medical Assisting], but then I realized that that's not really what I truly wanted to do...and so I went out of my way to try and change to automotive. And I did that and I find that I'm happier in it rather than medical. I find that in automotive, I can actually have more of an open mind, and I feel like I have much more freedom than I did in medical. I'm learning more about cars and stuff, and I'm finding that it's kind of like something that I always wanted to do since I started getting into it. And the fact that it's more hands-on and I could actually, like, move around and stuff like that, and I could do more and feel like I have more time in the shop where I can work on cars. There is always work for every individual student there.

Given the dramatic change of the coursework, this researcher was interested to hear what Elaine had to say about her preferred learning style. She described herself as a visual learner and said that she liked to learn from pictures rather than when people speak about content. Further, she explained that it's hard for her to keep track when people speak even though "I try to hang on every word." This is something that is visible at the CTE site. The school social worker spoke to this a bit during the focus group, stating: "Yeah, there isn't much, like, I don't think that there's much, like, "transfer me," like, if you're an auto. You don't want to do a lecture if you're an auto kid, you don't want to do computer animation."

There was some inconsistency with where Elaine's passions were with regard to CTE program. For her, it was about being happy in her learning, and she showed initiative in order to accomplish that for herself. Elaine stated that a big reason why she enjoys the program so much is the teacher. She described him as helpful and an advocate for students "no matter what." This is a dramatic difference from comments made about her experiences at her home school, where she described that "more class and more teachers" led to "pressure." She even stated that, at times, teachers have "bad days and sometimes put it on their students." She described a "weight lifted" at the CTE center.

Like so many CTE students, Hope has a clear desire to help others—something that draws a lot of students to career and technical education. Like many other students, Hope commented on persisting past issues:

> I feel like something that happens a lot in my classes the first time you learn something. It doesn't always mean you're going to get it the first time. It's like [the teacher] will give, like, almost a whole week to, like, learn one thing. And you're in your, you know, in my head, I'm a little bit like, oh, like this seems like a long time. But then once you're doing it, it's like, OK, like first day, you don't get it at all. Second day, you get a little bit more. And then as you go on, by the end of the week, you're doing it like it, like, you know, like it was nothing. And I feel like it's really awesome. Like to finish something, like the first thing that we did. Like when you finished your first manicure, you finish your first this or that. It's, like, it's kind of cool because it's like, I didn't think I could do that, but I can.

When asked for an example, Hope stated:

Yeah. Something that I did that I was, like, proud of was I did up to, like, a French twist. And I, like, it was, like, really hard for me at first, but I practiced. I also have a mannequin at home that I practice with, like really into it. So I don't get involved. But then I got it eventually, and I was really happy about it.

Tucker, a female student with special needs in the site's automotive technology program, followed a similar path to that of which Elaine spoke. Tucker was originally in the cosmetology program at the site. Her experiences in why she decided to switch were interesting:

Well yeah...I mean I really liked it because I liked the idea that I was going to be open a salon up within the mall or something at that point. There's way more to cosmetology than that...and then the looks and everything that you get from the guys. Oh, "cosmo girl, cosmo girl." I was never one of those girly-girls so it was really weird for me. So, I want to check out another class because I didn't even know it existed really. So, once I saw auto, I'm like, this is something I want to learn. So no one ever talks down to me again and I know what I'm doing when I get my own car.

There was a lot to unpack during this interview. First, the "girly-girl" comment, which Tucker actually said she "hesitates" to explain but that "I should know" what she meant. She did, however, go on to describe:

I wouldn't wear makeup. I wouldn't learn to do the makeup that most of the girls in the class would learn. I can't braid for my life. That's was the first time that we tried in class, and then from that point, I kind of realized I don't have a handle on

this right. But the whole wearing skirts and hair and makeup at sleepovers...I'd rather stay up late and watch you like a scary movie kind of thing.

The guidance counselor helped Tucker by arranging for her to spend some time in the automotive technology class, and though there was some initial hesitation, she felt it afforded her the opportunity she was looking for in a CTE program. Tucker has strong feelings about the gender dynamic that exists in this industry:

Personally, as a female learning about cars prevents when I go to buy my own car dealership or I go to get something fixed that. "Oh, dude where's your husband, where's your boyfriend." What kind of situation that they can talk to me and I know what I'm talking about.

She admitted that she has never actually had an experience like this but understands that there are stereotypes that sometimes exist. She agreed that some of her interest in the program stems from a desire to break a glass ceiling and be part of a vanguard. Tucker stated:

Well I've always thought there was since I got in the class, but that's a part of this generation, that girls are, like, no other gender equality and all that feminist stuff that going know, and that's important stuff. Yes. So, I mean some people go extremely overboard with it.

When further explored, she shared:

I mean, there are times that there are. I mean, you know, stuff that just annoys me here in there. Yeah, I've mentioned the teacher aide too, but she's a mom...so she

doesn't see it the way I see it. OK. Because once you become a mom, it's like oh, they're just looking out for you. Yeah, well, when it's working with others, it's a process because we all have different personalities. So, to get along and to get well, we have to get done and take a little longer, which is normal, once if we were in a group, to do one project and then we had another project afterwards in the same group. I'll probably get it done faster because we got a chance learning how each other works right by. If I were working on my own, like I did once or twice last year because I still didn't know how to work with the guys, I got it done pretty fast because I couldn't handle not having a project done at the end of the week. I mean, it had a certain time limit for myself. Going to two weeks was a little ridiculous, like come on, that should be done.

It seemed that perhaps, for Tucker, finding her strength was really just about learning about herself. Learning what it means not just to be independent but to be her independent itself, specifically.

Teacher as teammate. Students certainly want teachers to help develop their interests. This was an interesting thought put forward by Elaine and others, and it will be discussed further. Elaine spoke of the challenges associated with the CTE program (and a program switch). She said:

Somewhat, it is a little troubling for me because, you know, it's kind of hard for me to go into a new atmosphere and stuff. And I was, like, in the middle of the quarter and I just moved in there. So, it was kind of hard for me to keep track of everything myself.

Elaine speaks of performance difficulties. Not the least was adjustment to a different culture than the program from which she came. Elaine's motivations for success were bigger than one program, however. This was clear. During an observation of the automotive technology class, the outcome of Elaine's work was on par with the rest of the class. She seemed to have some trouble when it came to a certain tool to use, but again, this was not inconsistent with other members of her class.

Hope, a cosmetology student with special needs, talked about her interest in this trade:

> I'm in the cosmetology program, and I always kind of liked hair and makeup play from a very young age. I always wanted to do that when I was older, but I always kind of thought I had to go to college. And then, like, it would always be, like, doing prom stuff or something on the side. But then when I was in eighth grade, they [CTE teacher from the center] came to my school. And then I realized, like, that was something you could do. And I thought it was really cool. And then I asked her [the cosmetology teacher] about it when I was a sophomore, and they told me I could do it as a junior, and then I wanted to do it.

Like Elaine and Tucker, Hope seems to be battling preconceived notions of what her future is supposed to be with what she would like it to be. The latter is, of course, subject to change in an adolescent.

In sort of a funny way, Hope stated, "I have always liked school...I know that may be an unpopular opinion." Hope went on to describe how she learns best, which was more or less from a practical, hands-on approach, a common response. I noticed that she also made sure that she "checked every other box" first, however. I found that in other

responses from students. They would say "the teacher talking" or "worksheets" or "PowerPoints." Sort of a coverall." Hope continued:

> I learn best when, like, I would say by, like, PowerPoints and stuff like that. Like
> when a teacher, like, goes over stuff, like, with worksheets or like books and,
> yeah, that's kind of how I get it best. But I also, you know, I like most of it. I like
> the lab stuff, too. Or you, like, actually doing stuff, like, the curling and rollers
> yourself.

The overwhelming response from students was a hands-on, "spend-as-much-time-in-the-lab" approach. Hope spoke often about how she enjoys the "freedom" of the CTE center. Hope is a student who spends her entire day outside of the traditional district high school learning environment. Like every student at the CTE center, Hope spends half of her school day there in cosmetology and the other half at a different center that offers a more restrictive learning environment for students who might be emotionally, behaviorally, or developmentally disabled. We ended up speaking a lot about the different learning environments. Hope stated:

> I would say, like, the main difference is here. I feel like it's different because
> when I'm in my home school, it's, you know, so, like, I mean, not that this, not
> that this school isn't academically focused, but it's so academically focused on
> my other school. It's like, you know, you have Regents exams or you have this
> test and you have this test. And it's like everything counts for so much that it's a
> lot more stressful. I feel like here, it's a lot more calmer. And with challenges, I

feel like, I feel like things are more stressful in my home school. So it's more

challenging.

I wanted to know why it is "calmer." I found that it had a lot to do with the

teachers. Hope continued:

I think this is calmer because the teachers here are really understanding. And I

feel like they create a stress-free environment where it's like, yes, it's still work.

Yes. You're still preparing for, like, you know, the state board, and you still have

midterms, and you still have that kind of stuff. But it's more laid back in a way of,

like, it's not so much pressure. It's like you are doing this voluntarily because you

want to learn about your trade versus school, where you have to go.

Hope plans to go to college after she graduates high school. She wants to be either

a social worker or a psychologist. She commented about an interest she also had in law

enforcement.

Findings for RQ3

RQ3: What characteristics of a CTE setting influence student engagement in

+experiences, which are defined as experiences that have three features: action,

caring, and well-managed attention?

In career and technical education, students learn through experience. Active

learning is that which "involves preparation for future learning within the domain and

with related domains" (Gee, 2008, loc. 774 of 4419). Learning means being conscious

and reflective so that a learner can, as Gee (2008) describes, situate meaning. This

happens and will happen, says Gee (2008, loc. 830), through "metalevel thinking." The findings below reveal that CTE has a design of exactly the complex system needed to engage diverse learners.

Findings of RQ3 Across Both Comparison Groups

      Value is in the experience. Luke described that his "dream" is to complete his own full-length, 2D animation work at some point. That he is always taking steps toward meeting this goal. As Luke stated, animation is, to a great extent, about timing:

> They teach us a lot about, like, managing time and...time restrictions and what you have to do, and when it comes out in the end, it's, like, amazing. Sometimes you don't always get it, but, like, when you do get it, it just feels so good in just to see that final piece is just, like, just breathtaking.

Luke, who sees himself as a true animator in the making, discussed the importance of timing in his work. Animation students learn much on this topic. For example, "force" is a frequently discussed topic and what it can mean when applied to something like a character's joints. A character's hands and feet tend to rotate on their centers of gravity when a direction of movement changes (Whitaker et al., 2009).

      When asked for an example of a recent project, Luke described:

> I actually create a lot of different, like, projects for specific things, for example...the main one that I like to touch on is the competition [SkillsUSA] I had last year, which was a two hour time period to create a themed design of an area, which last year the theme was "Castle" [see Figure 2 below], where it's very broad...but the thing is, is that me and my partner did it is that we took on, like,

the mystical thing. And not only necessarily Castle itself would, like, the area around, like, dragons, sort of princesses, sort of that way. It allows us to, like, expand on and think, wow, I didn't think of that when I thought of a castle. I just think this big stone brick thing. But then when I think of castles, I think of a dragon...and we did that and was able to show as time restraints and a lot of cool techniques that we used to get around that. And I think we did really good doing it and made a really good project, and it really taught us a lot.
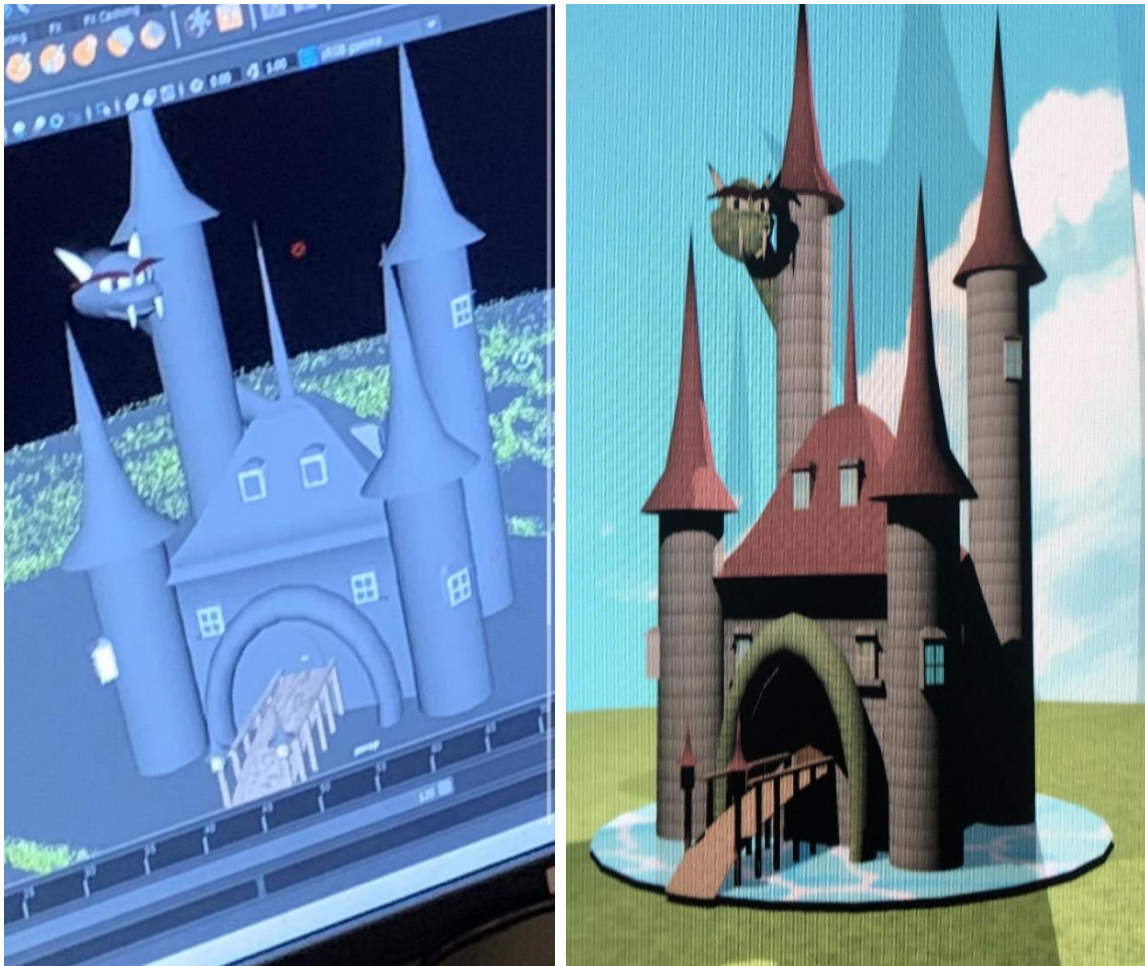

Figure 2. Luke's project under the theme: "Castle."

Luke had some additional things to share about his perceptions of the "real world." Certainly, there is an element of time management that is rooted in the program content itself, but for Luke, there seemed to be a notion of urgency in his approach to the work itself. He said:

> Well, I kind of knew, but here you can't take forever, where when I was younger, I always used to take my time with projects to make sure they're the best. But this [the work of the class, related software] sort of speeds up that process and teaches you ways to sort of be quicker about it and sort of make it better, where the longer way sometimes you'll get the same result or maybe a little bit less, but the quicker way can sometimes be the same or a little bit more.

For Luke, animation is a cause that motivates. It ignites a passion and steers him toward a purpose he feels he can control. There was urgency in the way Luke described getting his work completed; the perception was that he felt the locus of control was within him to complete it. This was combined with an optimism that he would be able to bring his creativity to life in his work.

Eunice said that she wants to be a video game animator. This class allows her to practice animating to see if she "actually enjoys it in the first place" and to see if "[she's] actually capable of doing it."

Eunice stated that in class, they are currently doing "walking animations." She stated that the way this is done is that you start off with making a stick figure and you animate the stick figure walking, and then you draw a body on top of that stick figure (see Figure 3). She stated that at first, she made her stick figures torso "way too long" so it

was difficult, even impossible, to make it into a human character. In the end, it ended up looking like a "demon-looking character that was, character that was missing its neck."
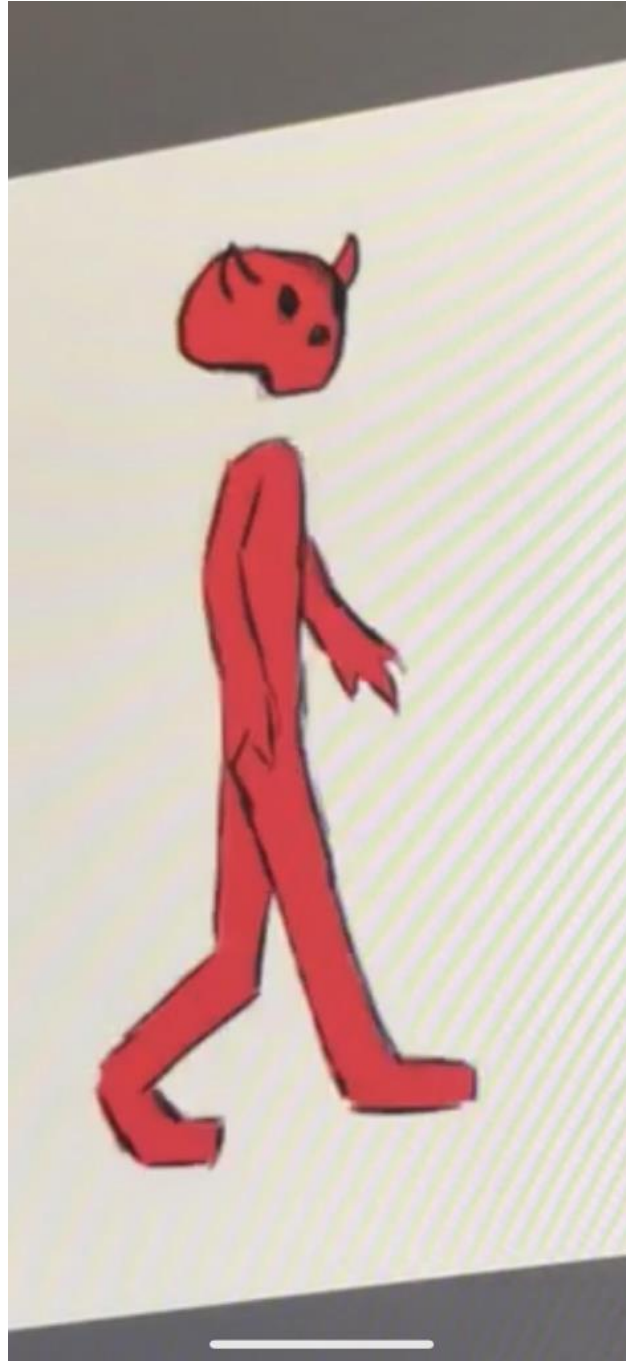

Figure 3. Eunice (computer animation)

Like Eunice, Andrea, another general education computer animation student but in her second year and a senior, was interviewed. Andrea explained how she came across the computer animation program at the site from hearing about it from a former student and friend who had been a student at the CTE center. Andrea spoke about how, in this program, she is "actually animating things." She explained that she is "actually doing and getting into what [she wants] to do." Andrea stated that even when she is "storyboarding," she is able to "see it" and see that it "went well." She is able to animate when she knows it will "go smooth."

Jimmy described that he learned best by doing hands-on work in "the lab." He described a "good day" as looking like "coming in and immediately getting to work in the lab and working on practical skills." A "bad day" looked like "back to back notetaking." Like Eunice, Jimmy articulated that when the stakes are higher and there is a greater degree of challenge, he rises to that occasion. Jimmy presented a clear passion for this industry through what he shared about the field experience that students in his class got exposure to at a local hospital during "clinic" experience. Lanford and Maruco (2018) presented findings that revealed similar connections between learning spaces and actual field experiences. Observation data from the site's medical assisting class revealed work specifically meant to prepare students for interactions they were likely to have with "live" patients in an actual hospital setting. This type of learning, when working with a vulnerable population (i.e., live hospital patients), requires practical work around it prior to ever setting foot in the field. The lesson observed helped students to explore related "soft skills." Students came away from the lesson with a clear understanding about how

something like one's stress can easily become a patient's stress and have medical implications if not navigated appropriately.

Clearly, part of this work, during the medical assisting observation, is a mindset and not just a procedure or protocol. Students went on to simulate this work in soft skills further. They worked together to select scenarios that might dictate conditions within which to practice. Nidhi, another general education student from the site's medical assisting program, spoke of how demanding the class could be. That it required her to learn how to manage her time and assignments more than other classes she had taken up to this point.

Jimmy also compared his experiences at the CTE center to his sending high school. He stated that the biggest challenge he had at his home high school was handing in an assignment on time, compared with "the hard work" of "performing CPR the correct way" and "learning how to take blood pressure" at the CTE center. When asked about a specific challenge from class, Jimmy described blood-typing and said that it is sometimes hard to get enough blood to do the test. He explains, "You end up having to do multiple tests while making sure it doesn't clot."

Cecelia, a cosmetology student without special needs, spoke about specific projects and the work she felt she was able to express herself creatively while performing them. When asked where she got the inspiration for this work, Cecelia stated: "I usually look up things on Instagram, Google, and sometimes I feel like I can do my own twist on it to make it more unique, like my own piece." (See Figure 4.)

Cecelia had an interesting take on some of her peers in her class that may "need more time and more help with some of the work that is done in the classroom or salon."

Rey, the school's social worker, commented on how many CTE students are those "with heart" and not necessarily the ones scoring the highest on exams. During the focus group, she stated: "And they're not the ones that are scoring the highest on these exams. It's the

Figure 4. Cecelia (cosmetology).

ones that are...wow, that girl knows how to do hair, that girl, like, touches it and just all comes together."

Zeus excitedly discussed how he takes the work home with him in a way that is helpful to his family and that they are very much an extension of the support he gets around his interest in construction electricity (see Figure 5). He stated that being involved in CTE has made him a better student. Specifically, he stated:

I think that, like, the things that I learned here, I think it made me more able to break things down because of the way that I'm taught here, I kind of try to use that in my school learning and outside learning. Like when I'm, when I'm in math

class and they give me a problem I'm like, "Okay, why don't I write the problem out instead of just reading it over and over again." And I try to write the words into symbols and try to even rewrite the question and try to put it in my own words to see if I can understand it better like I learn here.
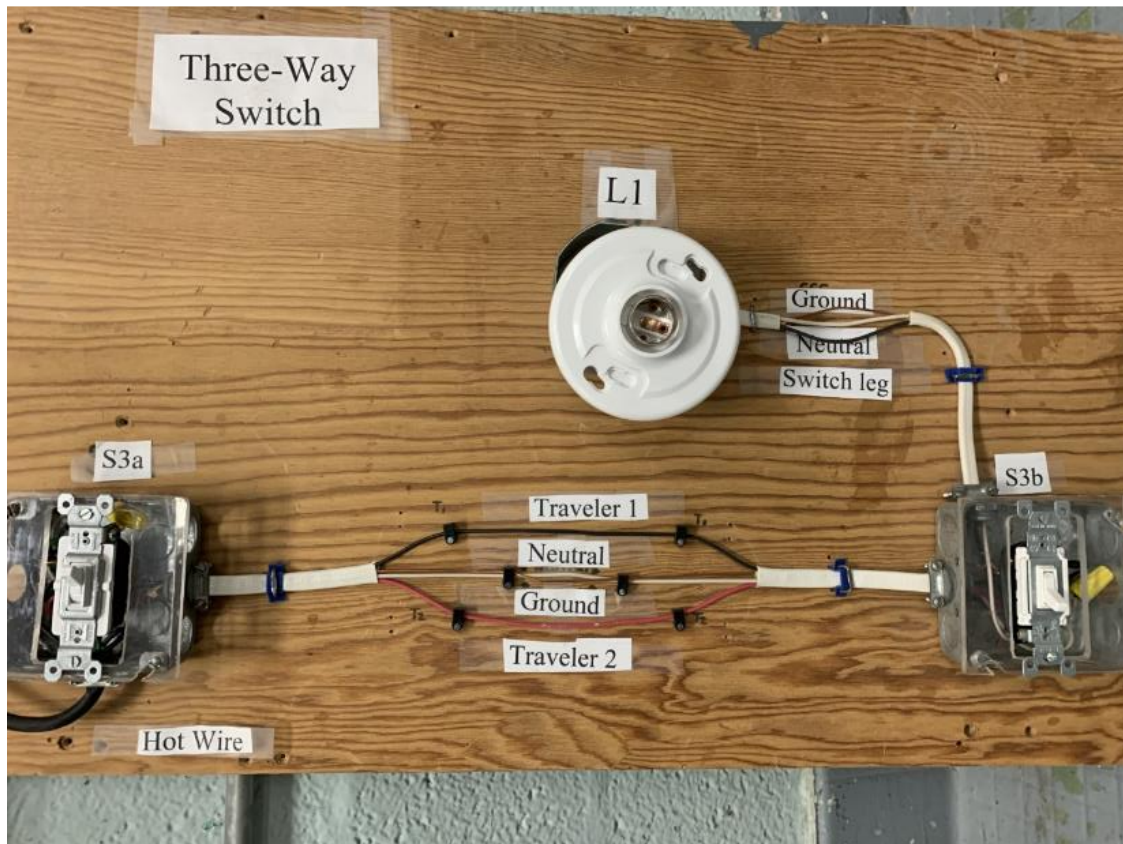

Figure 5. Zeus's construction electricity project.

Madison, a construction electricity student without special needs, already spends a fair amount of time in a work-based learning capacity outside of the program. He also works part time for an electrician. He described being fascinated by how many different career paths there were in the electrical field. Specifically, he stated:

I like that there's a lot of different categories when it comes to electrical. There's residential electricians working on houses, there's commercial electricians, there is, you know, people who work on computers, those are electrical technicians. They're all part of the same tree.

Madison stated that he learns best from watching someone else model what needed to be done with a given task first. He clarified by saying that if something is hard to remember, he will write it down for himself. Some things he is afraid he may forget, and then there are other things that get "burned in [his] brain."

Madison takes the work seriously. He said "regular high school will get me a diploma," but the work that he does at the CTE center will "get me a career." He admitted to spending far more time and emphasis on the electrical work and that he actually practices it outside of school. He may have implied at this point that he doesn't put this same level of seriousness and time into his academic work at the home school. Madison is certainly "a doer." He proudly stated:

> If feels like actually accomplishing something from the start to the finish, and when you do it all yourself, like when we're doing our own projects, which is what we're sort of starting now, it's kind of like, you know, everything that went into it and, you know, anything that, you know, everything that went into it.

When asked what she liked most about the program, Cecelia stated: "I like that I can graduate from here [the CTE center], take my state boards, and then start working right after high school."

Donna, a student with special needs in the medical assisting program, spoke about how her parents encouraged her to consider the program. She spoke about the broad curriculum that exists in her program and all that she's come to learn. She described herself as a more traditional learner who likes to "write down notes" and "read the textbook." Donna stated that she felt the program was "a breeze." In fact, she stated the only real challenge she routinely faced was when she had to speak "in front of the class." Donna did make some comparisons to her home high school. She stated: "It's different than what I do at my home school because here I'll actually go through with it and I'll try to push myself, but when I'm at the home school I'm just like OK." When asked to elaborate, Donna stated: "I tried to push through here more because, like, I know more skills here that I need in life, more than what I'm being taught in, like, regular home school."

Donna plans to go into the medical field. Because she wants to go "into nursing school," she feels this helps her confirm not only the time she spends at the CTE center, but that this career is one that she will enjoy. She stated: "It helped me understand that I want to be in it more, like if I didn't take this [the high school CTE program] and I wasted the time through four years of college and decided I didn't want to do it anymore."

Donna described that membership in CTE changed how she participates in school. She stated:

> I think it changed my work ethic because, like, I work hard in this class, so that
> kind of carried on to my other classes because like I said, I didn't really work

hard. Then I started here [at the CTE center] and it's like, "Oh, I actually need to work hard to get somewhere."

When asked about leadership, Donna first suggested that there wasn't any leadership in her class. However, she went on to describe an environment where everyone works together to do everything right. Donna described that there really are no "bad days" in her class unless there is a "huge test." When asked to clarify what seemed like an association between a "bad day" and a "huge test," Donna confirmed this to be the case. She went on to describe that she stresses a lot about an assessment. That she must "psych herself out" for that day just to get through it. Interestingly, though she does use them at her home high school, Donna refuses to use her IEP-mandated testing accommodations. She states that because of the duration of the session to begin with, she doesn't feel she needs them.

There was a good deal of discussion during the focus group about these types of experiences that students described. Polly, the school's special education teacher and SkillsUSA advisor, had the following to say with regard to how experiences can be formative:

> That could be the trap of high school in a regular high school...you know, you kind of get, like, you have this identity...the identity is defined...so you...for you, you know, within the parameters of high school, and you come here and you're in a completely separate place and you can shine. I think giving kids the opportunity to be leaders is so important because a lot of times, you know, whether a kid takes on a leadership role so that, you know, it does have to do with personality very much, but it also has to do with their environment as well. Do you have a friend

group where, you know, kids who have very strong personalities, so when you put a kid into that position, you know, you challenge them. And I think a lot of times they do rise to the occasion, especially kids who are not academic in the typical sense.

This is not always the case, however. While Polly discusses identity one way, Marie interpreted it differently:

For me, as the counselor, I find it split in half. Many of these students are in a field in which somebody in their families is in, and they've either worked there themselves or they've seen the passion that the parent has...you know, what your parents are, what they wanted you to be. I've also seen it work the total opposite way, too. I've seen kids whose parents were both in law enforcement or one in law enforcement, and they're here in electrical or their hand or computer animation, and I have asked, "Why haven't you followed in their footsteps?"...because they see the, they see the other side of that job.

Polly admitted that, hailing from a family of educators, her career choice was always interesting and maybe obvious, too. Rey described that, for some, this is a ticket out of poverty. The guidance counselor posited that it is also about self-worth for kids. She said:

So, I think in asking those kids that, I think one of the things that they would respond is, "I feel, I feel worthy. I have worth. I feel like I'm doing something, where in school, I don't like it. I sit, I listen, I'm lectured at, and I'm not participating here. I have fun," you know, and I have seen students personally

make a total change. They apply here and you give them that shot, even though the grades are subpar. Next thing you know, they're here for two semesters and their grades here are in the 90s. They're doing phenomenally. And then you check in with their home school, and they say, speak to an increase their grades there, as well. I love hearing that. I love to see how CTE has changed kids. How it has changed their learning and empowered them. It made it all make sense. Math and English now makes sense to them.

Focus group members agreed that the passion students have for the work that they do in their respective programs can ultimately lead to success. Much of this is captured within the school's social media account. Rey actually works closely in managing what is posted for the school. She speaks here of the power that exists when using it:

The other thing that's cool is that we've been getting tagged recently by students showing off their work. So, I'll post a picture, like a really nice hairdo that a student did on know a customer and remember it is and hashtag it. And then the community here sees it and they like it and they support it and it becomes this community feel, and I think that, you know...this generation is online and this platform is really powerful for them because this is how they communicate, how they connect, and that network and all of that. So I think that's a huge piece. And, you know, I happen to have an affinity for, you know, social media. Which, you know, we talk about is like a double-edged sword, sometimes. But, like, I think that this program needs that, like, needs, like, you know, our Instagram and needs that, sort of, because I do think that, you know, there's definitely been a stigma about it [CTE], and this just sort of shows it for, you know, like all the positives

that it has. You know, kids sharing that, you know, when I see, like, that post has been shared for a kid who's not a success in a normal academic setting. And here they are not all social media showing off this, like, amazing thing that they create, and that's really powerful to share it. And then all their friends see it; this is a way to showcase what they've done. "Yeah, they go out there and put me in the next picture, me. I want to be on it," like, they want to be on it because for them, it's so validating, and for them, that's a way for them to show off to their family.

Luke, from computer animation, described this a bit when he said:

But I feel like it [the home school] is not enough, where the time restraints and just sort of the rigid structure is, like, a little too suffocating for me. I'm just very open where you can let your imagination roam and just put your ideas into action, which I love so much about this place that just, like, lets you expand on your abilities.

Natasha, a general education cosmetology student, stated:

It's really rewarding when, like, we first do something, you don't really get it, and then eventually, you really get good at it. And then, like, when your teacher, like, compliment it and then makes you feel, like, so good that you actually did something good.

And Zeus shared: "I think it's like once I get in, I feel like I'm already at a full-time job. I feel like I'm already doing everything that I would be doing in the job."

CHAPTER 5

Discussions

Introduction

The purpose of Chapter 5 is to discuss the findings of this study and to present related recommendations and future considerations. The chapter presents findings on this topic to the leadership, practitioners, and scholarship communities for consideration, replication, and possible future implementation. It asks for consideration down avenues for future research based on the results of the study.

Through a qualitative phenomenological approach, this study explored the career and technical education learning environment from the perspectives of students with and without special needs. Specifically, this study reviewed the extent to which student disability classification and student preference of CTE program influenced the extent to which a student is successfully engaged. The study also reviewed the specific characteristics of career and technical education that work to engage students in what Gee (2017) refers to as +experiences.

Summary of Study

Significance of the Study

The push for increased advocacy and development of CTE has only heightened during the period in which this study was conducted. As stated, there is a recognized need for additional access to CTE opportunities for students with special needs (Lombardi et al., 2018). As has been discussed, funding sources such as Perkins V (2019) and related state-based funding have added emphasis to the accountability culture in education, where recipients of public funding are required to use funding to support student

achievement (Library of Congress, Congressional Research Service, 2006). The greatest amount of funding is provided to the student age group of 16- to 18-year-olds, at the heart of this study.

In many ways, the recent era of accountability developed with the passage of the No Child Left Behind Act (NCLB) in 2001 (Hess & Eden, 2017). It was popular legislation (passing in the House of Representatives by a vote of 381–41 and in the Senate by a vote of 87–10) and was a show of unity after the then-recent terror attacks on September 11th, 2001. States struggled with meeting the expectations of NCLB. Eighty-two percent of Massachusetts schools failed to make annual yearly progress (AYP), for example. The Obama administration made only a slight pivot in its implementation of the Every Student Succeeds Act (ESSA) in 2015. As stated (see Chapter 1), during both party administrations, funding for career and technical education decreased.

Theoretical Framework

Gee (2009, p. 94) speaks of members of the millennial generation, like the participants in this study, as those which "regret" the "societal fragmentation and extreme individualism" of the baby boomer generation. Millennials seem to stress commonality, community, and conformity, among other things, says Gee (2009). Students in this study see success in school as necessary for the future. Though some might be more aware of the credentials and skills that are needed and that do not necessarily come from, to use the participants in this study's own definition of their sending home high school, "school."

Participants in both comparison groups in this study are producers, and findings reveal that their experiences have much in common. To produce a word, image, or

artifact, says Gee (2008, loc. 481), a person must situate meaning within a "semiotic domain." In later works, Gee (2017) would have much to say with regard to member understanding of related judgement systems. Both the ability to situate meaning in a semiotic domain and the ability to access and understand a related judgement system was of productive value to students both with and without special needs during this study. As noted, the semiotic domain that Gee refers to is much like the lifeworld referred to by Husserl, and it perhaps might be interpreted by some as the pre-affinity space.

Husserl's notion of "lifeworld" is of importance here because Gee (2008) uses it in a slightly different way than did Manen (2016). Gee discusses the semiotic domain as a lifeworld. Moreover, in the same way that some refer to millennials as "digital natives," there are members of an affinity space that may be more native to an understanding of a judgement system (see Figure 7). In CTE, this is based, in part and at times, on the experiences and preferences of the learner. Though there are clear differences, what appears to be common in a lifeworld, semiotic domain, or affinity space is member awareness and understanding of the related judgement system.

Gee (2009) refers to a shape-shifting culture that exists, particularly with later generations like millennials, where people seek to pick up a variety of experiences and special skills. Other generations sometimes use this very notion to mock millennials for being inconsistent and, thus, without ambition. These skillsets are wide in scale and include interactional and technological sets.

More recent generations make considerations for their resume much earlier in life. In career and technical education, this is prolific. For example, SkillsUSA, an organization that encourages resume writing as a means by which to ensure that every

student is prepared for the changing workforce, has reflected on it and is ready to present as much. As stated in Chapter 2, findings by Gentry and her colleagues (2008) presented a great deal of individualization and self-pacing in CTE and, as will be further discussed, the importance of horizontal learning. The study concluded that the CTE center researched in this study offered many opportunities for student-centered choices to be made, that the teachers were developers of talent, and that students had access to professional organizations for youth (CTSOs) such as SkillsUSA. All of these confirm elements of Chapter 2's review of literature, particularly the work of Gentry et al. (2008).

The findings of this study might find many CTE students, with and without special needs, agreeing with Gee (2009, p. 99) when he states: "[Y]ou are what you experience." In his 2008 work, *What Video Games Have to Teach Us About Learning and Literacy*, Gee refers to how students internalize their video game experiences and that, despite the rich content that exists in a video game and its impact on multiple players, sometimes referred to as "multiplayer," the experience is really their (the "gamer's") own. It was in this 2008 work that Gee referred to video games as an "affinity group." Later to become "affinity space." As stated in Chapter 2, affinity spaces consist of seven primary features.

Methodology

This study followed a phenomenological set of design principles. A phenomenon is explainable (Vagle, 2016). Throughout the course of data collection and even more so during data analysis, this researcher found himself questioning elements of the phenomenon that sometimes are taken for granted, because what is sometimes overlooked in the day-to-day activities and events of a school were suddenly visible.

Students and staff participants seemed to sense this, as well. This was clear in how reflective they were throughout a given interview, for example. The very hands-on nature of learning is spoken of so much that it almost loses meaning until it is again visible, and one can connect it so easily to something a given student said during an interview. This also only emphasizes the importance of Gee's work on explicit talk.

In terms of method, this study followed grounded theory practices. A grounded theory approach to this study provided a way to identify the phenomenon in a way that it did not vary over the period of data collection. All the while attempting to suspend judgement of the existence of preunderstandings that may have existed. By triangulating data, particularly through the use of a focus group and observation data, this researcher was able to ensure that he was not the only one to determine where, when, and what in the data deviated phenomenologically. Indeed, this researcher, at times, found he became more familiar even with his own judgements.

In phenomenology, the unit of analysis and focus of inquiry is the phenomenon (Vagle, 2016). In subscribing to a grounded theory approach, analysis was one part Husserl and one part Heidegger. Put another way, one part descriptive and one part interpretive, respectively (p. 16). As stated in Chapter 3, this study made use of constant comparative analysis. This is to mean that analysis moved back and forth from initial and intermediate forms of coding to generate themes. In this way, data that was disconnected was later reconnected (Birks & Mills, 2017).

Discussion of Findings

Understanding a phenomenon as it exists in career and technical education meant harnessing the power of reflection. To begin with, this meant that this researcher had to

distance himself from the objects of investigation (Manen, 2016). There were commonalities across the varied data, and there were clear phenomena within the constant comparative approach.

The lived experiences of CTE students routinely reflected "doing." Indeed, findings present CTE students as "doers." For example (see Chapter 4), Luke, like many others, equated work getting done with a "good day." He actually stated: A "good day" is "plugging in my tablet and getting a good chunk of my piece done." Further, the same students who state "I take math" at their respective sending high school will state "I do medical assisting" at the CTE center. Similarly, CTE students will refer to the courses they take at their respective sending high school as those which they "need to take." These comments generally take place during an admission of performance difficulties at their respective sending high schools. Students contrasted this with the opportunity they chose to be a part of at the CTE center at the heart of this study.

Findings revealed that there was a great deal of intensity in how CTE students spoke of the work they do and the time they spent at the CTE center. There was agency in CTE students, and this is central to what makes them who they are as a population. It goes beyond their disability classification, grade level, time in the program, and other attributes, and this reveals the CTE environment, as it presents just the intentionally-targeted instruction and intervention that may be needed to work on, for example, an underdeveloped skill (Hahn, Horowitz, & Linse, 2020).

Targeted learning involves students understanding where their learning is taking them as much as teachers as they design it. Pathways must be transparent, says Hattie (2017). Teacher clarity leads to trust between teacher and students. When this is

combined with awareness and understanding of related judgement systems, it leads to trust among members of an affinity space.

Themes

Findings of the shared experiences of students, with and without special needs, revealed a supportive environment for diverse learners where the outcomes illustrate examples such as: student empowerment, a sense of team, and varied forms of leadership therein. Lived experiences of students, with and without special needs, also revealed a climate that offers a contrast to the lived experiences at a student's respective sending "home" high school.

Additionally, findings presented that career and technical education programs encouraged the achievements of each member of the CTE affinity space. All learners, with and without special needs, are encouraged to develop all their skills. This includes academic integration coursework as it pertains to the trade-area. For the participant-students in this study, some for the first time, career and technical education provided a pathway toward engaging in this type of success. For some students in this study, this made them, perhaps unfairly, resent the "traditional" education of their sending home high school.

Central phenomenon. Findings revealed that success for CTE students toward meeting successful outcomes begins with student awareness and the degree of access to a respective CTE judgement system (Gee, 2009) (see Figure 7). As has been noted, success can be varied, vertically and horizontally. CTE allows this flexibility for student participants. It helps students explore different interests that once "fanned into passion" can fuel active participation, says Gee (2013b, p. 173). For students with special needs in

this study, this was more closely related to the judgement system of the CTE center, its culture, rhythms, routines, and Gee's characteristics of an affinity space, in general. This study's findings revealed that, for students without special needs, the judgement system was more closely aligned with specific CTE program success criteria. CTE students achieve success based on their ability to understand, succeed, and surpass expectations within the judgement system they follow. In either sense, students need, and deserve, to understand judgement system expectations clearly.

Once clear expectations for success are established, the characteristics of an affinity space that are prolific in career and technical education support students with and without special needs. As shared in Chapter 2, Gee and Hayes (2012) spoke to both individual and distributed knowledge as being important in a nurturing affinity space. The CTE environment is one that nurtures these very relationships and is a fundamental building block for the active work that takes place in career and technical education. It builds trust and capacity within the learning space. This creates a formula that is often driven by +experiences.

Table 5

Gee's and CTE +Experiences

Gee's +Experiences	CTE +Experiences
Action	Hands-on Learning
Caring	Sense of Team/"Family"
Well-Managed Attention	Distributed Teaching and Learning

Table 5 compares Gee's +experiences with its CTE counterpart, based on findings from this study. As Gee (2008) states, people play video games in a variety of different ways and for different purposes. This includes just how much students are willing to challenge themselves. In order for a member of a space to challenge themselves and engage in +experiences, they need to have an awareness and understanding of related expectations.

Figure 6. Central phenomenon within career and technical education as affinity spaces.

Success outcomes for students with special needs were found to be connected to factors that were the result of program completion. Completion of a CTE program meant transference and the general feeling of accomplishment. Special needs students like Elaine and Tucker spoke about the challenges they had overcome and the resilience that came from experience, whether it was successful or not. Remember that both Elaine and Tucker transferred from one CTE program to another during their time at the CTE center, something that it is a rarity.

Though communicated to some extent or another by all CTE students, students with special needs, like Elaine, presented with a great deal of self-efficacy development. They were proud of this ability in themselves. Self-efficacy is the confidence or strength of belief that we have in ourselves that we can make our learning happen (Hattie, 2017). Those with high self-efficacy, says Hattie (2017), are more likely to see hard tasks as challenges rather than try to avoid them. Elaine spoke of failure as a chance to learn and to add more effort or use new information the next time a similar challenge presented itself. Gee (2008) describes that learning, at times, is or *should* be frustrating and life-enhancing. It is important to ensure that what is difficult is life-enhancing. This is a part of the evolution of relationships cultivated from shared interests within a CTE affinity space.

Career and technical education is an environment where participants of like interest spend the largest part of any of their singularly directed educational time together. They spend this time cultivating this shared interest to meet success outcomes. These can be long-term goals such as furthering CTE education into a postsecondary

setting or a certification in a specific element of the coursework (i.e., OSHA 30, CPR, etc.). They can also be short-term, such as learning how to successfully wire a three-way switch or other project-based outcomes in a unit of study.

Ultimately, shared interest creates connections and relationships that go beyond sending "home" high school and other non-program identifiers or anything superficial in nature (see Figure 7). The culture becomes disarming and safe. It is ok to be wrong because, for example, the CTE teacher shares the same interest and has been wrong at some point, too, as shared through anecdotes from the field. Possibly when the stakes were much higher. Relationships are such that participants are eventually ok with expressing themselves through the work. This comfort works on each student's individual schedule and can be the first day or last day of school. This creates a culture and sense of team that some participants describe as that of being like a "family."

There is a relationship between a stronger sense of team, or "family," and success outcomes of participants. The more cohesive the class is in the way that has been described above, the more likely the following will exist:

- Students will be accepting of help and in turn will assist others.
- It will help when students work through challenges, either individually or as a group (this is most of the time as a group)
- It will foster creativity and a culture of continuous improvement

Virtually all students, with and without special needs, speak to an environment where they are a part of creating this type of culture. This can include both their teachers and family members. Findings revealed that this was a culture of continuous improvement. One that supports them as much as it challenges them. Despite some

healthy competition within CTSOs like SkillsUSA, findings reveal very clearly that this is not a binary world. Almost all students spoke of leadership as guiding and helping their peers and "good days" as time spent working in collaboration with others to achieve a shared goal or learning and "doing something new." This is, in part, measured by how students speak to the +experiences (Gee, 2009) that they have at the CTE center.

CTE students feel empowered. At their respective home high schools, findings revealed that students felt less control and more stress. Powerlessness can be dangerous and lead to desperation. This impacts a child's ability to learn. This is particularly true, and perhaps alarming, when the CTE setting seems to access in these same students a spirit of resilience to learn about a given interest. As noted, CTE students in this study were especially self-reflective. This was especially helpful in a study like this one. As a researcher, this was presented in a way that revealed an existence that is intertwined with their CTE program. Students described a journey to and through CTE. They did this is in a manner that not only presented itself in speaking but through physiognomy, as well, which was hard to deny and, in some cases, needed no clarification.

This is not to suggest CTE is some sort of educational utopia, however. Student-participants from the site's construction electricity program expressed frustration and impatience at the lack of a steady program teacher, something much more readily available in the academic setting. As noted in Chapter 1, it is often challenging to find a CTE teacher. It can feel like a vicious cycle when the most popular programs are, in fact, popular because of the same rewards of that respective industry, which keep potential teachers there in the first place. This is despite various pathways that have been opened to trade experts to expedite the process toward becoming a teacher.

This study's first research question states, "How, if at all, do student characteristics such as disability classification influence participation in a CTE program?" In career and technical education, learning happens as a community (see Chapter 2). Student characteristics such as disability classification influence participation only so far as the composition and characteristics of the specific program community afford an opportunity to succeed in varied outcomes. The findings of Curwood et al. (2013) are important and relatable here.

Curwood et al. (2013) posit that the "traditional classroom" infrequently affords a sense of distributed learning and that, most of the time, the individual achievement is what takes precedence. As stated in Chapter 2, within career and technical education, learning takes place as a community. Husserl might refer to this as a "lifeworld" where things move, change, and are based on relationships (Vagle, 2016). Where full participation means a fully developed and engaged identity on the part of the learner. Similarly, findings from this study found that the extent to which students find their identity was associated with direction in learning. Husserl had suggested that living and experience take place in the intentional relationship between the subjective and the objective (Vagle, 2016). What is in between is, at times, ever expansive. More grounded was Heidegger's perspective on the relationship between the participant and activities, says Vagle (2016). Gee might be more likely to find Heidegger's sentiment more agreeable when it concerns affinity spaces if the findings of the study have anything to say about it.

What we see in career and technical education is perhaps more Heidegger than Husserl in that there is a consciousness that is brought into being. Inherent in CTE at the

site is the ability for students to apply for a program of interest. Students who were participants in this study had the opportunity to make preferences on the school's application as to which CTE program they preferred to be enrolled in.

This is quite different from the compulsory nature of education in "traditional schooling," where students rarely have opportunities to make choices that are a true reflection of their emerging identities. The team-like nature of CTE (which includes the CTE teacher), when properly positioned, can translate into successful outcomes for students with and without special needs. An example of where some of these state components might be lacking (at times during the period of this study's data collection) is the site's construction electricity program. This is why this study continues to emphasize the importance of a regular expert trade teacher for each CTE program.

The electrical program at the CTE center and site of this study went through some personnel changes the school year in which this study took place, and as a result, students did not have a regular teacher for an extended period. During the focus group, Polly, a special education teacher at the site, hesitated a bit to comment fully on it and instead left it at: "but there's just, like, a different culture in the electrical room." As stated in Chapter 4, Madison's comments included his frustrations on the lack of consistency and cohesiveness in not having a CTE teacher when he spoke of the importance of teacher experience, as it varied with each new face that entered the classroom in the capacity of the teacher. Specifically, Madison stated:

When it comes to the classroom, you need to be able to explain it and make sure that everybody grasps it at the same time. If they don't, then you kind of have to find new ways to teach it. Teaching and showing are two completely different

things in my mind because, you know, you can show somebody something like
ten thousand times. If you don't explain it correctly, they're not going to get it
right.

There's a certain degree of wisdom and maturity in this statement. It might be
what makes Madison an effective teacher of this trade himself one day. This is almost
identical to findings presented by Lanford and Maruco (2018) (see Chapter 2). Also, and
as shared in Chapter 2, the research of Casale-Giannola (2011) emphasized the
importance of the teacher-student relationship in CTE and the impact it has on student
success, particularly during adolescence.

Participation. Participation in career and technical education is not unlike what
students would expect to find in "the real world." Though there is participation in hands-
on work and the more academic, classroom work that includes academic integration of
ELA and math, findings revealed that students mostly equate participation with what
happens in the shops and salons of the CTE center. Some cosmetology students speak to
their arms getting tired during work in the salon. This is something that is eventually
compensated for a bit in the strategies that cosmetologists use but can be challenging for
someone just learning related techniques. Drugay (2015, p. 10) spoke to some of the
elements of cosmetology to be prepared for, saying: "School can be physically, mentally,
and emotionally draining. You'll be in class learning theory and on the salon floor
learning technique, so you need to be prepared to sit for long periods of time and stand
for long periods of time."

Like Ricky from automotive technology, Cecelia said that she wants to learn
"every little bit about hair and makeup and be able to bring it into the real world." Like

virtually all of the other students interviewed, Cecelia owns her story. This was something that the researcher was mindful of during the data collection process (Durdella, 2017). Further, this sentiment and ownership of one's story and emerging identity was palpable throughout each interview and with each student. Any educational "makerspace," and in many ways, this is what CTE is for some, is based on student ownership of what making and learning means to and for them (Fleming, 2018). This was consistent during the entire auto observation and harkens to the findings of White (2015) with regard to the degree of empathy that exists and resulted in better outcomes for students.

Findings from the auto lesson on power brake operation revealed that students were actively engaged whether they were in the classroom or the shop. The lesson began with a demonstration of how power brakes operated. The teacher was mindful of the differences that exist between a gasoline engine and that of a diesel engine. This was all modeled by the teacher through the use of related equipment and software while in the classroom and the use of an automotive technology software that was interactive, where each student had the ability to manipulate the pathway through which brake fluid entered and flowed through the system. At one point, a student, recognizing something he had seen while in the shop at some point, asked, "Is that the same as the one on the Volkswagen?" In general, students never seemed uncomfortable asking for help, reassurance, or clarifications in their understanding of specific aspects of the lesson.

When students were in the shop, they had the opportunity to work individually or in small groups. Some of what Betty referred to about the task-oriented leadership style of culinary existed in auto, as well, from a procedural standpoint. For example, student-

managers were delegated the responsibility of helping to ensure that tools were checked in and out properly and that items were appropriately maintained and inventoried. There were several interactions between those students charged with this type of responsibility and those who depended on them for tools to be at the ready during active work that was being performed. Each interaction was professional and business-like despite whatever work-related demands may have existed for students.

Alice is a second-year student with special needs in the Police Science program. The first thing said by this student was that the program had influenced her to pursue a career in law enforcement. Gee (2009) writes of students finding their identity through learning. This may sometimes mean that they disidentify, as well, with parts of themselves. For CTE students like "Betty" who are "doers," this truly seems to be about productivity. Alice spoke specifically to "tactics" learned in the class as among her favorite parts of the coursework. She felt the program and its teacher "...push me out of my comfort zone...make me want to succeed and achieve my goals. I understand that challenges are inevitable."

She described that challenges were really opportunities that helped her to achieve goals she had set for herself. Tony, an automotive technology student with special needs, commented on the importance of how "the teacher is interested in the same thing." He stated that this is an advantage when facing a challenge. For Alice, one such opportunity CTE promotes is the ability to compete in SkillsUSA, a career and technical student organization (CTSO) in which Alice competed with other students from different CTE centers in the region (and placed first). Gentry et al. (2008) (see Chapter 2) presented similar findings. The ability for students to make choices and be challenged routinely on

an individual level and the "repetition" that Alice speaks of is certainly a reference to the value of horizontal learning. Like Gentry et al. (2008) found, teachers at the research site were developers of talent, and students had access to professional organizations for youth, also known as career and technical student organizations (CTSOs), such as SkillsUSA. Nidhi, a general education student from the site's medical assisting program, said of SkillsUSA that it helped encourage her to "get her grades up" so that she might be able to participate in competitions. An important element of these competitions and participation in them is how students are able to work through and with specific communication barriers. This is something findings have revealed is practiced often in the classroom. In medical assisting, students learn that messaging can be distorted, and being aware of potential barriers such as pain, hunger, and anger and how they can impact a patient's visit can all be important to the work (Blesi, 2017).

This is not to suggest that driving a classic Volkswagen bus to California does not put out a certain charm, but when learners believe in themselves and are confident in their own self-efficacy, they are able to set more effective goals (Curwood et al., 2013). Perhaps more realistic goals, as well (I didn't tell Jimmy that part).

Sense of team. Students in the study describe a setting that cultivates the strengths in themselves and each other. An environment where feedback is accepted rather than being discounted. Learning goals through a program's respective judgement system are clear. Gee (2013b, p. 170) describes a "deep learning space." One that creates solidarity and mitigates the effects of outside status. Of interest was how Jimmy described the "strong bond" that exists among students in his class. He describes how the class has group chats and that, at times, they all meet up to do homework. This bond

seemed to exist even with students that are not from the same sending high school. Jimmy describes how "that's not important" and that this is "not a focus." In fact, Jimmy describes that one's sending high school doesn't even come up in conversation. Further, he said that this also works positively in reverse. When students that are from the same sending high school form a connection at the CTE center, it has made them closer at the sending high school also. Gee (2013b, p. 134) describes his affinity spaces (see Chapter 2) as "examples of synchronized intelligence" where "multiple tools, different types of people, and diverse skill sets are networked." Moreover, much like Curwood et al. (2013) presented, participants take advantage of multiple routes to participation, communication, and collaboration.

Knowing about a social practice always involves recognizing ways of interacting, feeling, and knowing certain qualities that constitute the social dynamic that has been found to be so prolific in CTE. It is exactly those shared practices, patterns of consumption, and ongoing relationships that Gee (2009) discusses as characterizing an affinity space. Indeed, perhaps it is no accident that Jimmy uses the word "bond," as Gee (2009, p. 89) also describes an affinity space as people brought together through a shared affinity for a common goal, endeavor, or interest because they are "bonded" to each other. Nidhi, also from the medical assisting class, shared that she always had trouble making friends until she came to the CTE center.

Similar to Jimmy, Cecelia had described a social dynamic that contributes to success in the program for all students. This is similar to the findings of Casale-Giannola (2011, p. 10), in which students were found to support one another. This foundation certainly creates a team-like atmosphere for CTE students whether they have special

needs or not. Clearly, it helps to know where others stand in terms of content knowledge. It builds confidence to understand that a learner is not on their own in their degree of understanding. Finn admits he originally did not want to go to college but is now considering a two-year school and a program in automotive at the postsecondary level.

Leadership. Findings revealed that true leadership at the CTE center is a team effort. Leaders in the CTE affinity space foster collaboration. They do so by building trust and assisting in cultivating relationships. Gee (2009) describes that when individual students have achieved in a specific part of the curriculum, they might help other students. There is an effort toward shared knowledge where students teach each other. CTE students made frequent reference to, at times, taking over some of the teacher's traditional leadership roles. Though this is, in some ways, different from what was reported by Betty, a female culinary arts student with special needs who attends the site in the afternoon, when she said the following:

> There's many different roles of leadership in the class. It depends on, you know, what point of the class we're in and what we're doing from like, you know, someone just even giving out the recipe so people, you know, giving out the jobs and who starts and who ends...it's pretty much what we're doing. All the rules always change but it's never the same person ever in the class.

Content knowledge as it is associated with leadership extends to CTE teachers, too—and goes beyond this. Students want teachers to take them seriously (Smith et al., 2015). Being responsive to students' learning and emotional needs, caring for students, and encouraging students to participate and take academic risks is inherent in the role of a CTE teacher.

Students with special needs exhibited a great deal of leadership. This presented as closer to what Gee stresses about leadership taken for the sake of the common endeavor. As stated in Chapter 2, there are some things that are so important to a cultural group that the group, fueled by their passion, ensures that everyone who needs to learn them has (Gee, 2009). Students like Tucker reported a classroom culture that strengthened others and allowed students to develop competence in each other.

Learners will collaborate with masters, using appropriate tools, and are given feedback for their efforts (Gee, 2009). Tucker's reporting on her interaction with student leadership in her class provides evidence of this and is, emotional or not, an example of the power of what matters to students. Students served each other in different classroom and shop capacities and, in doing so, built up mutual trust. Tony also confirmed this in his interview and spoke to the common interest all members of the space had, including the teacher.

This was similar to the findings of Toppin (2018) that identified how CTE classrooms were often run and managed as actual shops as they are in the field. And Finn might characterize some of these items from the lesson as leadership. For Finn, leadership is when someone "steps up" and shows other students how to do things they may not have understood otherwise. The only "bad days" were those where there was something at the home high school that "kept me from here [the CTE center]." Betty described leadership in her class as that which was practical in nature. She stated that it was someone who "gives out the recipe," someone who delegates some of the jobs in the kitchen, someone who has a general understanding of what is happening that day in the kitchen, besides the teacher. The power of CTE is present in Betty's experience. She

described that it has confirmed for her that she really does enjoy culinary arts and that this a "real situation, like being in an industrial kitchen."

For Betty, her CTE program celebrates tacit knowledge that is built up by daily practice and stored in the routines of the space. As noted above, this is also present in the interview and observation data collected from other students with special needs in the site's automotive technology program. Betty spoke to it more logistically. More from the standpoint of ensuring task completion. Though there was, at times, hesitancy on Tucker's part to offer praise to a peer, perhaps most important to this interview response is that she stated that the student had emerged and had been identified as the leader. This is because she or he took on the role of explaining what needed to be done. This anecdote reveals that when something is at stake, students will disregard personal feelings and collaborate. These findings are consistent with Curwood et al. (2013), a study that investigated the extent to which participants were likely to share in their creative work through an online portal (see Chapter 2). The same often appears true of distributed leadership among members of a given learning space.

Understanding a CTE judgement system through horizontal learning. For students with special needs, the notion of horizontal learning was clear (Gee, 2009, 2013b). That is, learning that is based on situated and routine practice (Gee, 2009). Students spoke to the stress of "school." CTE offers an environment where consequences are lowered, and risks of failure are not as visible. This therefore presents an opportunity to more completely learn a skill without having an urgency to move on to the next. As presented in Chapter 4, students with special needs spoke to how, in a healthy way, opportunities for horizontal learning removed the notion of prerequisite anxieties.

Horizontal learning allowed students to feel safe in their approach to learning new skills. This was immediately present in the early stages of data collection. This meaning can also change over time. It can also differ according to the CTE program a student is enrolled in, the sending home high school they come from, and other social-emotional or family-related factors.

Betty spoke about how culinary arts was an incentive for her to "go to school." That Betty had issues with physically getting herself to school, let alone in her academic performance, was something that pervaded her interview. Wagner et al. (2016) wrote of how, particularly for students with special needs, CTE provides an environment for learning in which this population is more likely to finish high school (see Chapter 2). Duckworth (2016, p. 17) might interpret the difference in performance and student achievement from one learning environment to another as "needing to find a way to explain" a concept. After all, for Betty, culinary arts is "my thing."

Career and technical education offer different modalities to learning than students have ever seen before. This occurs on a regular basis. Learners, having been provided with an opportunity to work with their hands (often voiced as the preferred learning style of research participants in this study), may balk at the first opportunity to participate. However, when this type of learning is made available to them with an expert trade's teacher present and in different settings, it is far more likely that a student will warm up to the idea of participating.

Career and technical education present accessibility to varied learning styles. Students revealed that there was control in the learning they acquired through their CTE work at the site. The traditional classroom does not usually have multiple routes to

participation (Gee, 2009). It was abundantly clear in the findings that students were aware of this difference. All aspects of the CTE learning environment are set up to encourage active, not passive, learning.

Betty preferred not so much the "showing off" element referred to by Marone (2015, p. 10), but "showing over telling." Consistent with Marone's (2015) findings, however, was that creativity was often the outcome of a social process. This was clear for both comparison groups. It was clear that participants cared very much about what they created and being known for making such contributions.

Through horizontal learning, judgement systems can transform, says Gee (2013a). As will be described, the extent to which a student participates, invests in a certain preference of CTE program, and learns at the CTE center or the specific CTE program is associated with the full understanding that judgement systems provide. The CTE learning environment affords an opportunity for students to achieve this type of understanding and awareness of a given judgement system. This is particularly true of students with special needs and is reflected in interview data. Findings revealed that for students to achieve success outcomes that include engagement in learning, they need to, at the very least, find comfort in the semiotic domain of career and technical education. This has been noted for students with special needs. As will be discussed further as it pertains to RQ2, students, particularly those with special needs in this study, found the CTE learning environment as a vehicle for success even if they were not fully invested in a specific CTE program (i.e., Tucker in cosmetology or Elaine in medical assisting). Further, learning is an extension of self, says Gee (2009). CTE as an affinity space provides pathways that

students can use to extend themselves and, most importantly, achieve—some for the first time.

Judgement systems are a feature of affinity spaces. The more interest and awareness and greater understanding of the judgement system, the more likely a participant, in this case, a CTE student with or without special needs, will be invited into the team-like atmosphere that exists in CTE—sometimes referred to by students with special needs as "family." Coyle (2019, p. 8) describes the power that comes from being around a group that "has chemistry." It makes members "crave connection," says Coyle (2019). Career and technical education programs are designed in a way that prevent the group from transcending one member's achievement. Instead, they transcend each member's achievement.

The judgement system can offer slight variations depending on the student or group of students. As stated, the preference of class is directly tied to this. As stated above, Eunice, a student in computer animation, spoke of a passion for this field that extended into her home each evening. She described that as soon as she returned home after school each day, she would continue to work on her current project. All three computer animation students spoke to the accessibility to authentic learning that the program afforded them. Eunice attributed part of the success she had to the lighting of the classroom, which did not carry the fluorescent lighting so often seen in schools and instead had off-centered lower light like that of a studio. Like findings presented by Lanford and Maruco (2018), Eunice entered the computer animation space with an important social foundation in the friendships she had from the home school.

Eunice accepts that she struggles a bit with procrastination in "this class," and she made specific mention of the amount of time in the CTE session (two and a half hours)— that she cannot afford to procrastinate or she will be "severely behind." She went on to say that this was something she had to learn, saying "at the beginning of the year" she thought she could "take a break" for an hour or so and all would be fine. She quickly found out that in order to finish her project, she wasn't able to do it to the best of her ability because of the little amount of time that she had left to do it. She went on to explain that she cared about the authenticity and quality of the project that she had been working on. Eunice describes that she can be easily distracted and so this is something she had to work through, even in CTE. As was shared in Chapter 2, Gee (2015) spoke of the degree to which students begin to understand success criteria, also referred to as a judgement system (see Figures 7 and 8), as "socially negotiable" in nature. At the site, Eunice describes that the same friends who generated her interest in this specific program are the friends that at one point would distract her a bit before she began to prioritize her time differently.

RQ3 states, "What characteristics of a CTE setting influence student engagement in +experiences, which are defined as experiences that have three features: action, caring, and well-managed attention?" There are many characteristics of the CTE setting that influence student engagement in +experiences. According to this study's findings, some examples are the cultivation of relationships, a team culture, or what some students referred to as" family," and distributed teaching and learning. As presented in Chapter 2, Curwood et al. (2013) conducted a study that highlighted the power of leveraging participant leadership. Instead of resting completely on the teacher, leadership and

mentorship in an affinity space can be distributed across many individuals, texts, and students (Curwood et al., 2013). According to students in this study, +experiences were more prolific for students with special needs. This was often discussed when students were comparing their CTE experiences to those at their sending high school. Findings in this study revealed that when student-participants have an interest in something and want to take it further, they can join "interest-driven collaborative groups" (Gee, 2013a, p. 74). Career and technical education offers this very item, and based on the findings of this study, it plays out in the form of a judgement system, as has been defined in Chapter 1 and developed for its impact in CTE as shown in Figure 7. CTE as affinity spaces offer instruction, mentoring, coaching, guidance, and modeling.
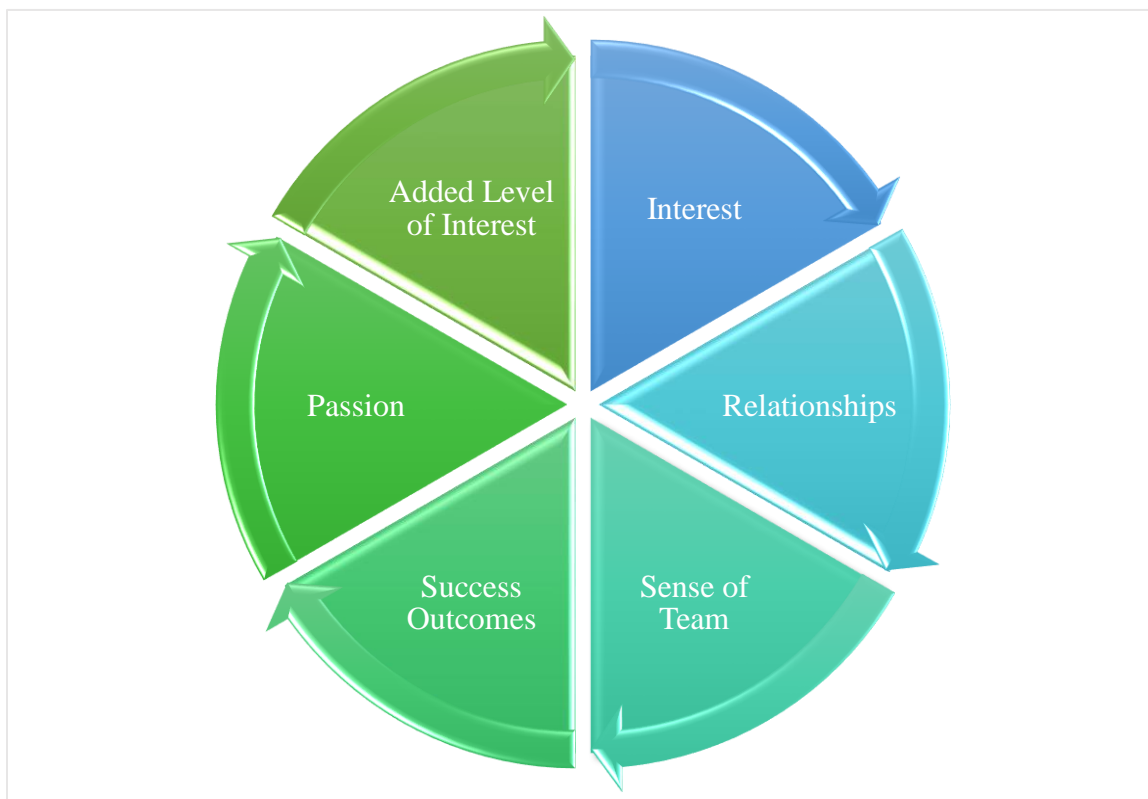

Figure 7. The impact of judgement system awareness in CTE.

When describing affinity spaces, Gee (2013b, p. 75) refers to them as "distributed teaching and learning systems." These are "interest-and-passion fueled." Once in these related spaces, it helps to develop skills. This all depends on how long a person decides to stay in the space. In high school CTE, many of the same structures (guidance counselor, academic teachers, school leadership) exist as they would in the sending home high school and work to curtail truant students, for example. Career and technical education is also held to all of the same mandates as the sending home high school, such as following a student's Individualized Education Program (IEP). Generally, students who find themselves struggling in one aspect or another of the trade will be met with not only the "judgement system" of the CTE teacher but the judgement system of traditional school, such as ensuring they arrive on time and are "on-task" when appropriate. Put another way, CTE offers flexibility, but not to the same extent as a website devoted to a certain video game, where persons with that interest can come and go as they please.

Whether through a video game website or at a high school, students must internalize to learn. Gee (2017, p. 71) writes of traditional schools facing a problem in "doing." He states that if schools want to face more than just knowing, they must begin to view the problem from the standpoint of how they can get students opportunities to internalize. Gee (2017, p. 72) feels that "doing" is the best way to gain knowledge. It is in doing that students have to put their knowledge to "meaningful use." This is very much the ideology of career and technical education.

Gee (2008) describes the importance of a learner needing to learn not only how to understand and produce meaning but to do so in a way that is recognizable to others in a given domain. More than this, however, is the ability, says Gee (2008), for learners to

produce something that is both recognizable and novel to members of a given space. This is really about an authentic learning experience. Lanford and Maruco (2018), presented findings that revealed similar connections between learning spaces and actual field experiences.

This is not unlike what one might expect to find in the industry. A director might write on a frame or create rough sketches for an animator to use as a guidepost through the creation of a storyboard (Whitaker, Halas, & Sito, 2009). Another computer animation student, Andrea, spoke of the joy she found in being able to write a story while she "storyboarded" to get a sense of the visualization. She stated: "I like to be able to animate, and then see it." Perhaps this, as was presented in Chapter 2, is the embodiment of what Gee (2009, p. 85) meant when he stated: "Thus science in school is learned best and most deeply when it is, for the learner, about 'being a scientist' and 'doing science'."

Eunice described being more motivated at the CTE center. She said she can be "inspired by something she saw online and "use it in her project" in an "artistic sense." She said that she loves to be able to "make her drawings come to life." When describing the class's recent work with walking animation, she said she can "make it move and create an actual story with it." She described the great feeling she has in being able to create something from a "vision in your head." She described that it is "satisfying to watch something straight out of your head become physical right in front of you."

There is a great deal of thought that goes into the work of computer animation. Movement like that of what happens in animation means an understanding that movement is caused by the effect of forces acting upon matter. Movement also gives a

great deal of information about the objects, themselves. The animator's job is to apply just the right amount so that the animation seems natural (Whitaker et al., 2009).

Andrea spoke about the authenticity in the work that is done in her program when referring to the pressure that comes prior to the annual film festival that students attend at a nearby college. Findings were clear that students are in the program because of the creative outlet that it creates for them. Andrea states, "We sort of came here knowing what we want to do instead of just, you know, being told to do so...we challenge ourselves where we are given the opportunity." For Eunice and Andrea, CTE provided direction. For other participants (i.e., Jimmy and Betty), CTE provided the opportunity to access a more productive and possibly healthier part of themselves. This is not all that different from Gee (2009, p. 85) stating that the merits in video games are that they allow people to be "new things in new worlds."

Jimmy feels that all this hard work is well worth it. It is what he wants to do with his life. He spoke of the challenge as healthy, in that he feels it will "push [him] harder towards the overall goal of at some point becoming a registered nurse and getting [his] CMA [Certified Medical Assistant certification]." Hattie (2017) describes how the mind develops in response to challenge. That the mind grows as learners take control of the learning process and that it is best supported by high-quality dialogue among peers. Jimmy describes himself as persistent. When asked to explain what he meant by persistent, Jimmy stated: "It means going home and reading over the textbook and making index cards and taking your little brother's pulse."

It is access and attention to these that lead to successful and well-managed action in the learning domain. In CTE, when students speak about how their interest brings them

together as a team or "family," it is their attention to the judgement system of the class that invites them into this "family." Perhaps this is why it was so important for Betty to "prove" herself.

As noted, students frequently contrasted their district high school learning experience to that of the CTE site. A common component of this was that when at the sending high school, students were expected to gain the same knowledge across the board. References such as these confirmed some of what Gentry et al. (2008) observed when uncovering what students had to say about the difference in learning that existed at the sending high school when compared with the CTE center. For example, one student stated: "I'd be more comfortable, I guess, going about solving a problem, and that's more because I'm more comfortable here and in the environment that we have here because of that...I guess it's like, it's just like, I like being here. I want to be here."

A different student stated: "Because I feel like more weight is lifted over here rather than at [sending high school]...you know...it's like, you know, lighter and more free."

Data like this speaks to the horizontal learning opportunities discussed above. A different student stated as much when discussing the level of stress attached to work at the CTE center when it was contrasted with experiences at the sending home high school:

And it's like everything counts for so much that it's a lot more stressful. I feel like here it's a lot more calmer. And with challenges, I feel like, I feel like things are more stressful in my home school. So it's more challenging.

Gee (2017) posits that children do not first have grammar lessons and then later on see what happens when they put language into use but derisively discusses how

language is taught this way. As noted, CTE promotes a large degree of horizontal learning. In an affinity space, there is no rigid distinction between work and play because people in the affinity space have committed to something in which they have an interest.

A genuine effort in meeting the emergent needs of all learners was represented at the site. CTE classes are traditionally composed of students of mixed ability, the classes at this site being no exception. Students are presented with a great deal of choice in the learning at the site. Of course, this begins with their input in a shared decision to be enrolled in the program to begin with. In one automotive technology lesson on power braking, students were observed in the classroom, in which every single student had the opportunity to come to the SMART board and trace their finger along the brake line of a car. Minutes later, students were being shown where this was under the hood of a car in the adjoining shop. Each student then proceeded to use the brake pedal. The teacher, a more than 20-year veteran and licensed high school teacher, asked questions such as: "Where does your finger go first?" "Second?" and "What surprised you [during the process]?" Students often cheered each other on at each step. Ultimately, learning was discovery-based, at an appropriate pace, and gradual. It took all learners through skill building, collaboration, and critical thinking.

Both students with and without special needs expressed instances where they, at times, experienced academic frustration. There seemed to be a great deal of intrinsic motivation in CTE students. Intrinsic motivation is a desire to do well or accomplish a task efficiently (Blackburn, 2014). This was linked to how students saw value in the CTE program itself. Value in the coursework was correlated with a student's realization that

there is value in the program and that they are doing something for which they believe they have a chance at success.

As noted, the team dynamic that exists in career and technical education is a contributor to success outcomes, as described by student-participants in this study. Team members include students, teachers, school leaders, a guidance counselor, and other related support staff such as the school social worker and teacher aide. CTE as affinity spaces also include family members. Students at the CTE site make frequent reference to an environment at the sending high school that does not afford an opportunity to network with each other and with various tools and technology. They are instead working as individuals for that corresponding achievement, not a collective one. Indeed, to function in an affinity space, students need to develop skills in communication, teamwork, and problem-solving, says Gee (2013a). Further, affinity spaces can be used to build knowledge through "synchronized intelligence" (p. 150). Perhaps it is worth a reminder that Gee (2009) is writing critically about traditional education.

Cosmetology students engage in the invaluable experience of academic integration into their program content. In some states, is only provided through apprentice work in an actual salon and so does not offer the academic integration piece (Drugay, 2015). Similarly, animation and timing go hand in hand. Just as the director needs a great deal of experience to time out a film mentally before any drawing is done, when the animator commits their ideas to paper, they are telling their story (Whitaker et al., 2009). Students in computer animation at this site hold the same authentic expectations for themselves. Gee (2009) discusses that an environment where the common endeavor is

clear and apparent is one that is far less likely to have demographic items such as race or gender or classifications such as disability in the foreground.

Relationship to Theoretical Framework and Related Research

The learning environment of career and technical education provides participants certain degrees of freedom. Ever the gamer, Gee (2009, p. 102) describes how, in a "good role-playing game," he is able to develop a character that is a reflection of his values, making him consider what he values and what he does not. If video games afford gamers an opportunity to play the game reflectively, then based on the findings in this study, this researcher posits that career and technical education affords an opportunity to *learn* reflectively. CTE teachers tend to share stories from the field where the context is readily understood against the backdrop of the hands-on work conducted in the shop, salon, or kitchen. When and where appropriate, stories are a helpful way to present a child with special needs information that he or she might not have otherwise have picked up on their own (Garland, 2014). This is often effective when communicating safety and making associations to an injury in the field being the outcome of unsafe behavior or practice. Conversely, CTE teachers must be mindful to not let their stories interfere with their own ability to understand the extent to which content is learned through formative assessment. Students are building an identity through these types of learning events.

CTE students begin to build an understanding of working in this type of real-world capacity. To "be" an electrician or a cosmetologist. This is easier to accomplish in career and technical education than in the traditional academic setting. Gee (2009, p. 105) refers to this as a "projective identity." The findings in this study reveal that students can certainly project an identity through the work they do in CTE with far more clarity than

through passive classrooms that stress "skill-and-drill" activities—classrooms that lack the very freedom of a "good role-playing game," such as that which one would find in a traditional classroom education setting.

The CTE learning environment in this study also presented as accessible to diverse learners. Students with limited cognitive skills can benefit from visually modified materials, such as photographs or fine line drawings, to communicate important concepts (Hahn et al., 2020). Several students expressed that they experienced struggles for many years when paying attention or engaging in their respective district high schools. In offering a different route to participation, CTE as an affinity space helped to balance stimuli, changing what the view of success could be for these learners. In all likelihood, there was always a willingness to participate on the part of these students, just not in the way that was familiar or promoted at the home high schools.

Limitations of Study

In theory, the members of an affinity space are those with a varying but clear commitment to a common interest. High school programming and vacant seats sometimes preclude a student's membership in the CTE program of their first choice and possibly their second. Gee (2013a) argues that, in the future, schools and colleges should be a network of well-designed interacting affinity spaces. For this to be made a reality, practice must rise to that occasion.

A limitation in this study is the potential bias of the researcher. The researcher, the members of the focus group, and all student-participants are either employed or educated by the agency in which the research took place. The researcher, himself, is acting principal at the CTE site. All staff-participants in this study are in some way

charged with the implementation of instruction or the creation and cultivation of student needs to meet successful achievement.

In general, the use of a focus group carries unique strengths. It also has the potential to be a source of problems (Cyr, 2019). There was validity in that this group of individuals meets regularly (weekly) as the school's Student Support Team (SST). This setting was not contrived and felt like business as usual for focus group members, who are used to established norms. As noted in Chapter 3, the moderator-participant of the focus group was the school's school worker. The members of the focus group were a guidance counselor, teacher, and the school's social worker. There may be a threat to population validity here.

There is no voice of staff from any of the constituent home high schools. Most students referred to their home school in some pejorative manner and contrasted both learning environments. In those moments, it felt like there was a voice missing. Though it was of value that student-participants felt comfortable making themselves vulnerable in their discussion of a comparison between their sending home high school and the CTE site, it sometimes felt like some students were a bit harsh and might have been doing so for the sake of the position of the researcher. This feeling was comparable to how some students approached responding to interview questions.

Some students felt like they had to respond to every question during interviews. The researcher was mindful of this, but it may have worked to offset the findings of some aspects of the interview process, however minimal. For example, Nidhi seemed to reply to an interview question regarding learning style out of a need to have a response. There seemed to be some hesitation and, with it, a defaulted answer of "taking notes" and

having "due dates." Nidhi's responses also were sometimes made in question form. This seemed to be more out of nervousness than for clarity's sake.

Recommendations for Future Practice

The question, according to Gee (2009), really becomes: "How do we design our affinity spaces?" For learners, this is about experiences. Though experiences may all have meaning, they can have negative ones, as well. Gee (2013b, p. 151) himself speaks of how he certainly did not mean to "romanticize" affinity spaces and that they can just as easily do harm as well as good for those who participate in them. However, Gee (2013a) does emphasize that people need to be connected. Further, that this is the way to work toward solving problems and make meaning of varied situations.

The makeup of a group in terms of the support it offers its members is crucial to its creativity (Gee, 2013a). Community-building is at the core of successful engagement in CTE. Central to this is the CTE teacher. Madison from construction electricity spoke to it best in Chapter 4. Though challenging to find an expert teacher of the trade, it is even more so when it comes to finding someone who also has ability to work with high school students. High school students who, in many cases, have no trade knowledge. Many would-be high school teachers are coming right from industry without any formal training in how to be an educator and are expected to marry the trade to the pedagogy immediately.

This could mean not understanding everything from how to pose an open-ended question to generate a discussion among students to de-escalating a potential classroom issue or conflict. All too often, new teachers become confrontational, and by overasserting themselves in the eyes of students, escalate and intensify a situation that

needed decompression instead. The findings from this study show that students need assurances that they will receive the help that they need to engage in that which they have an interest.

Career and technical educators should consider working with students to identify personal learning goals for the work they do. This could come in the form of discussing their time in the program as a whole or even for one unit of study in the curriculum. In this regard, students need not be treated as struggling students but, through goal setting, be supported in understanding where individual strengths and weaknesses exist. This will allow for an opportunity for both teacher and student to understand each other initially and be proactive in the support of each other as members of the affinity space. Interest again being at the heart of Gee's theory for why an affinity space forms. Though practical outcomes exist, the findings from this research recommend that CTE centers cultivate the passion in learning that inspires new ideas.

Recommendations for Future Research

Research findings were heuristically significant. Learning is becoming more and more personal. Gee (2009) refers to this again and again. He also refers to the fact that learning is a "social journey" (p. 82). Findings show that CTE students in this study are taking this journey as social learners, indeed. They are good at sensing subtleties in the behaviors of their peers, for example. They use their knowledge of content and the judgement system of their CTE program and of the greater CTE site. The feelings they have for this approach to learning manifests in how all participants in an affinity space succeed. They communicate through explicit talk that is specific to a shared interest.

Future research should review the following:

- The extent to which a correlation exists between whether a student preference of program and student success outcomes, such as attendance should be further reviewed. This researcher had previously conducted a pilot study on the degree to which a correlation may exist between student preference of CTE program and student attendance. The results of this inquiry were significant in that if a CTE student was enrolled in their first preference as it appeared on their entrance application, they were more likely to attend than if they were enrolled in a class other than their first choice.

- Expanded review of the characteristics of a CTE setting that contribute to student engagement for the sake of generalizability. As stated in Chapter 2, Theobald et al. (2019) conducted a quantitative study using longitudinal data in Washington State. This study investigated relationships between CTE enrollment and secondary and postsecondary outcomes. This research examined CTE "concentrators." Of great importance to this study was that students with special needs who were enrolled in a CTE course in 11th grade had slightly fewer absences than did observably similar students who were not enrolled in a CTE course. Further, this illustrates the need for a qualitative study that examines the characteristics of a CTE setting that influences student engagement, for example, the CTE teacher.

- Perhaps most important is the need for further clarity into the CTE teacher's role. In this study, a student like Betty was quick to report that she only went to "school" – that is, the sending home high school, because she was able to go to her culinary arts class also, incentivizing the time spent at the CTE

center. Future researchers in this area should consider a question such as, "To what extent does a CTE teacher need pedagogical training to foster the type of environment that Betty and Jimmy speak about?" We may add so to avoid a situation such as the one that Madison and Marie describe about the lack of a consistent teacher. For example, before Jimmy started out in medical assisting, he described that he wasn't motivated "to be better." Further, that the teacher helped me to work to my full potential."

- Career and technical education students are resilient in their efforts to learn. A question for further consideration is around the extent to which CTE learners are more, in Gee's words, +resilient because they went through CTE coursework. For example, is it the horizontal learning opportunities that exist in CTE that assist in the development of resiliency in learning?

- Many schools and this site make use of Instagram and other social media platforms. It would be interesting and important for a future study to look at this type of learning environment from that lens, as well. Gee (2013b, p. 171) discusses how digital media, including social media, can provide an opportunity to organize "outside the formal institution." That it has the power to create additional flexibility and a more "adaptable affinity space." It certainly has the means to create an additional portal by which to access the space.

- There is a clear foundation for a study similar to this one that looks at gender-related comparison groups. Characteristics such as gender are also emphasized in Perkins V legislation, which asks that CTE education providers prepare

CTE centers for non-traditional fields. Dweck (2016) says that math and science need to be made more hospitable places for women. That women need all the growth mindset they can get to take their rightful places in these fields. Elaine, a special needs student and a female from automotive technology, stated, "You have to be able to have that mindset of working in a group, and you have to share your opinion a lot." Saying later: "If you're close-minded, you can't." Followed by, "You have to break out of that." Like Tucker, Elaine, as a female in the automotive technology program, is a nontraditional student. CTE student participation in, and completion of, CTE programs lead to nontraditional fields. Findings revealed that where elements of grit emerged in this study, it was usually in female participants (12 of the 20 student participants). Perhaps most important to the future research in this area is further clarity and definition of what is vital to a CTE judgement system. This would include the degree to which it varies with the needs of the learner.

Gee (2013b, p. 171) advises against some of what was described of Elaine's disposition in Chapter 4. He states that a "group of one" can be isolating. The findings from this study would confirm this (see Figure 7). This is particularly so, says Gee, when considering the global world we live in today. Individual expertise is important but should be shared and integrated with other people's skill sets. This might make it more challenging for female CTE students to define personal successes. Jimmy is a male student in medical assisting and is also considered to be nontraditional, yet he didn't speak to the same themes and challenges as did Elaine and Tucker. Interestingly, Gee (2013b, p. 87) cites a study of what makes a "smart group." There were three factors that

significantly predicted that a group would be "smart." The first and second were social perceptiveness and conversational turn-taking, respectively. The third was the percentage of women in the group. Gee suggests that this may be due to women scoring higher on measures of social perceptiveness than men in a related study. Perhaps, this would explain a bit of why Tucker stopped to reflect so often on her experiences in her automotive technology class and why male students, also interviewed during this study, made no mention of the same social dynamic.

Conclusion

"Affinity spaces are good places to imagine new possibilities and even to help make them come true. They can recruit different perspectives, diversity, and multiple talents to tell stories no one person could have made up on his or her own," says Gee (2013a). Gee (2008) asks several questions, that are relevant to career and technical education. One such question, made relevant here is, "Is this [CTE] a good or valuable affinity group to join?" Based on the findings in this study, that answer for most student-participants would be yes.

First, career and technical education programs are designed in a way that prevents the group from transcending one member's achievement. Instead, the space transcends *each* member's achievement. The conventions that children learn to follow when learning within the CTE affinity space are social in nature, findings revealed. Each member, including the teacher, is a part of this.

Next, the CTE learning environment directly channels the ambitions and passions of students. As an affinity space, it makes respective members regularly conscious of

what they feel is valuable and important in their studies. CTE helps students to see a direct relationship between how hard they work and how much they learn, and in doing so, reinforces effort.

Finally, often at the sending high school, students are only focusing on what is already known and are not actually making discoveries. Further, this is often focused on the existing abilities of students. As stated in Chapter 1 and as findings reveal, *students need only be themselves.* When students applied to a CTE center and to a given preference of program they were, perhaps for the first time, committing to an identity.

CTE students take science labs at their sending home high school, but it does not mean that they understand the values and norms—the judgement system of a biologist. Gee (2013b, p. 93) discusses a greater understanding in "citizen scientists," those who have no official degree or credential but who share in the interest of science. As the findings in this study reveal, this looked different for students with and without special needs, but both were powerful, indeed. Perhaps it is no surprise that, when analyzing data, the most prominent words represented in all interview data were: "Something Different." It certainly would not be surprising to Betty, who actually used these words during her description of what CTE offered.

Appendix A

Dissertation Timeline

October 2019	Proposal Meeting
January 2020	IRB
January 2020–April 2020	Collect and Analyze Data, Write
March 2020	Finalize
April 2020	Present

Appendix B

Participants Consent Form

I _____ agree to be a participant in this research study to learn more about staff and students' perceptions of the Career and Technical Education learning environment.

I am aware of the following:

- This study is being conducted by Patrick J. Dunphy Jr. (doctoral candidate) under the supervision of Dr. Randall Clemens at St. John's University.

- The purpose of this study is to explore the extent to which a career and technical education (CTE) setting offers students what they need to be successfully engaged.

- I will be asked to participate in an interview about my perceptions of my being a Career and Technical Education student. The interview will take approximately 20–30 minutes.

- My work products/artifacts from class may be used and published as part of this study.

- There are no reasonable, foreseeable (or expected) risks in my participation, and I can skip any question I am not comfortable answering.

- My participation is optional, and I can withdraw or refuse to participate at any time without a penalty.

- My participation in this study will NOT impact my grades and/or academic standing in any way.

- My name and ID number will be kept confidential and will not be used in any conversation or report associated with this study.

- A copy of this permission slip will be stored in a locked cabinet and will be shredded at the conclusion of the study.

Student's Name (print):

Student's Signature: Date:

If I have any questions, I can ask Mr. Dunphy Jr. directly. If there are any questions that Mr. Dunphy Jr. is unable to answer, I have the right to reach out to his faculty supervisor, Dr. Clemens, at St. John's University at Clemensr@stjohns.edu or via telephone at 718-990-5537.

I have explained in detail the research procedures in which the student has consented to participation.

Principal Investigator_____

Date:_____

Appendix C

Parent/Guardian Consent Form

Dear Parent/Guardian,

Your child has been invited to take part in a research study meant to explore student perceptions of the Career and Technical Education (CTE) learning environment, taking into consideration programming choices students made to be a part of a given class. Patrick Dunphy Jr., doctoral candidate at St. John's University, will conduct this research study. It is requested that you read this form and ask any questions that you may have before agreeing to be in the study.

If you agree to allow your child to participate in this study, your child will be asked to participate in an interview about his/her perceptions of their CTE learning experiences. Participation will involve approximately 30–40 minutes. In addition, student-made work products may be requested as artifacts.

There are no reasonable, foreseeable (or expected) risks other than what is found in a student's everyday classroom experience. Although your child will not receive any direct benefits, their participation will help inform the impact that the Career and Technical Education learning environment has on student learning outcomes.

All information collected in this study will be kept private. Confidentiality of your records will be strictly maintained. This includes eliminating student names or anything referencing student identifiers. All consent forms will be stored in a locked file cabinet and will be shredded at the conclusion of the study.

The decision to participate in this study is entirely up to you. Your child may refuse to take part in the study at any time without affecting his/her relationship with the investigator of this study or St. John's University. Your decision will not affect grades or academic standing. You will have the right not to answer any single question, as well as withdraw completely from participation in the interview at any point during the process. You have the right to ask questions about this research study and to have those questions answered by me before, during, or after the research. If you have any further questions about the study at any time feel free to contact me, Patrick Dunphy Jr., at Patrick.dunphy03@stjohns.edu. If you would like, a summary of the results of the study will be sent to you. If you have any other concerns that have not been answered by me,

you may contact Dr. Randall Clemens, Associate Professor at St. John's University, at (718) 990-2554 or clemensr@stjohns.edu.

Your signature below indicates that you have decided to allow your child to volunteer as a participant for this study, and that you have read and understood the information provided above. You will be given a signed and dated copy of this form to keep, along with any other printed materials deemed necessary by the study investigators.

Sincerely,

Patrick Dunphy Jr.
Doctoral Candidate at St. John's University

Parent's Name (print): _____

Parent's Signature: _____ Date: _____

Student's Name (print): _____

Student's Signature: _____ Date: _____

Appendix D

Student Guardian Consent Form

Dear Student,

You have been invited to take part in a research study meant to explore student perceptions of the Career and Technical Education learning environment, taking into consideration programming choices students made to be a part of a given class. Patrick Dunphy Jr., doctoral candidate at St. John's University, will conduct this research study. It is requested that you read this form and ask any questions that you may have before agreeing to be in the study.

If you agree to participate in this study, you will be asked to be interviewed about your perceptions of your CTE learning experiences. Participation will involve approximately 30–40 minutes. In addition, student-made work products may be requested as artifacts. There are no reasonable, foreseeable (or expected) risks other than what is found in a student's everyday classroom experience. Although you will not receive any direct benefits, your participation will help inform administrators of the impact the CTE learning environment has on student engagement and achievement.

All information collected in this study will be kept private. Confidentiality of your records will be strictly maintained. This includes eliminating student names or anything referencing student identifiers. All consent forms will be stored in a locked file cabinet and will be shredded at the conclusion of the study.

The decision to participate in this study is entirely up to you. You may refuse to take part in the study at any time without affecting your relationship with the investigators of this study or St. John's University. Your decision will not affect your grades or academic standing. You will have the right not to answer any single question, as well as withdraw completely from participation in the interview at any point during the process. You have the right to ask questions about this research study and to have those questions answered by me before, during, or after the research. If you have any further questions about the study at any time, feel free to contact me, Patrick Dunphy Jr., at Patrick.dunphy03@stjohns.edu. If you would like, a summary of the results of the study will be sent to you. If you have any other concerns that have not been answered by me, you may contact Dr. Randall Clemens, Associate Professor at St. John's University, at (718) 990-5537.

Your signature below indicates that you have decided to volunteer as a participant for this study, and that you have read and understood the information provided above. You will be given a signed and dated copy of this form to keep, along with any other printed materials deemed necessary by the study investigators.

Sincerely,

Patrick Dunphy Jr.
Doctoral Candidate at St. John's University

Student's Name
(print): _____

Student's Signature: _____ Date: _____

Appendix E

Teacher Consent Form

THE SCHOOL OF EDUCATION

Teacher Consent to Participate in a Research Study at St. John's University

Title of Study: Career and Technical Education as Affinity Spaces: Perspectives from Students with and without Special Needs
Investigator: Patrick Dunphy Jr.
Subject's Name:

_____

 Dept: School of Education   Phone:_____

Introduction
- You are being asked to be in a research study of which the purpose is to explore the extent to which a career and technical education (CTE) setting offers students what they need to be successful as measured by Gee's affinity spaces theory.

- You were selected as a possible participant because you are teacher or CTE student.

- We ask that you read this form and ask any questions that you may have before agreeing to be in the study.

Purpose of Study
- The purpose of this study is to understand how CTE students with and without disabilities view their learning experiences, which is in part based on choices they made to be in a given class.

- Ultimately, this research may be part of a dissertation toward a degree of Doctor of Education in Instructional Leadership and published.

Description of the Study Procedures
- If you agree to be in this study, you will be asked to answer questions related to your experiences as a career and technical education (CTE) teacher.

Risks/Discomforts of Being in this Study
- There are no reasonable or foreseeable (or expected) risks. There may be unknown risks.

Benefits of Being in his Study
- While there are no expected direct benefits to participating, the findings of this study are intended to inform future studies and practice in this area.

Confidentiality
- The records of this study will be kept strictly confidential. Research records will be kept in a locked file, and all electronic information will be coded and secured using a password-protected file. No information in any report we may publish would make it possible to identify you.

Payment
- You will not be paid for this study.

Right to Refuse or Withdraw
- The decision to participate in this study is entirely up to you. You may refuse to take part in this study at any time without affecting your relationship with the investigator of this study or St. John's University. Your decision will not result in any loss or benefits to which you are otherwise entitled. You have the right not to answer any single question, as well as to withdraw completely from the interview at any point during the process; additionally, you have the right to request that the interviewer not use any of your interview material.

Right to Ask Questions and Report Concerns
- You have the right to ask questions about this research study and to have those questions answered by me before, during, or after the research. If you have any further questions about the study at any time, feel free to contact me at cell: 516-965-4022 or patrick.dunphy03@stjohns.edu. You can also reach out to my faculty supervisor, Dr. Clemens at St. John's University, at Clemensr@stjohns.edu or via telephone at 718-990-2554. If you like, a summary of the results of the study will be sent to you.

- If you have any problems or concerns that occur as a result of your participation, you can report them to the Dr. Raymond DiGiuseppe, IRB Chair, at 718-990-1440 or Dr. Marie Nitopi, IRB Coordinator, nitopim@stjohns.edu 718-990-1440.

Consent

Your signature below indicates that you have decided to volunteer as a research participant for this study and that you have read and understood the information provided above. You will be given a signed and dated copy of this form to keep, along with any other printed materials deemed necessary by the study investigators.

Subject's Name (print):_____

Subject's Signature: _____
Date:_____

Investigators Signature: _____
Date:_____

Appendix F

Semi-Structured Interview Protocol of Study Questions

1. Tell me a little bit about what program you are in and how you came to find yourself in that program.

2. What do you like about your program?

3. How do you learn best?

4. Does this program challenge you?

5. How do you approach a challenge you might face in your class at GC Tech? Is this different to how you might approach a challenge in your home school?

6. Do you find the program meaningful? Enjoyable? Explain.

7. What do you want to do after high school? How does the CTE fit into this plan?

8. What kinds of classes do you take at your home school? How do they compare to your CTE classes?

9. What is it like to create something in your class? Explain.

10. Have you come up with any creative designs in a specific project that you have worked on? What motivated the design choices that you made?

11. What have you learned about the world from your CTE program?

12. How has membership in CTE changed how you participate in school? Changed "you" in general?

13. What does leadership look like in your class?

14. Describe what a good day and a bad day look like for you in this class.

15. What kind of goals have you had for your experience here? Have you met them?

16. To what extent has GC Tech cultivated the interests you have had prior to becoming a student here? What specific evidence do you have for this?

17. What kinds of things do family members at home say about the work that you are doing in CTE?

18. What would you tell someone that is thinking of coming here?

19. Is there anything that we have not discussed that you would like to discuss? Do you have any other comments you'd like to add?

Appendix G

Observation Protocol

Descriptive Notes (including timestamp)	Reflective Notes (Experiential)	Emerging Themes/Initial Formulation of Categories	Examples

References

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