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Understanding transformative learning in professional technical education: the circular framework of change.

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MEd

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This is dedicated to my parents, who taught me that the real value of work, in its various forms, is not monetary. And to my children, who I hope will understand work in such a way that they may sit on the porch at the end of the day and quietly smile with satisfaction.

Abstract

There is a stigma linked to professional technical education (PTE) and the skilled trades in the United States that has plagued it since the Industrial Revolution. In another vein, transformative learning, in its continuing evolution since inception in the 1970s, has become a respected and desirable goal of adult higher education. This study explores transformative teaching and learning in a case study professional technical college and reveals the methods and transformative potential present in the curriculum, educators, and students to such a capacity as to debunk the stigma. The findings uncover an educational framework that lays a foundation for transformative potential and supports the claim of professional technical education not as a siloed path for the non-college bound, but as an education on par with other respected four-year routes. It is time to drop the labels and recognize all tertiary levels for what they are – higher education.

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A very special shout-out goes to my children; Jack, Mary, Troy, and Sully. They never once complained of having to eat in the living room or standing at the kitchen counter because the table was covered with books, papers, and computer paraphernalia. While striving for them to see their mom earn a doctorate, their acceptance of unmade beds, take-out, and unattended laundry piles kept my perspective intact about what is really important.

Finally, I wish to thank the research participants who shared their valuable time and stories with me – stories which proved moving and inspiring. That they were willing to participate and trust me with their words further proved there was something to say that matters. I hope I have done them well.

Author's Declaration

I declare that, except where explicit reference is made to the contribution of others, this dissertation is the result of my own work and has not been submitted for any other degree at the University of Glasgow or any other institution.

Printed Name: Brandi Jean Love

Signature: _____

List of Acronyms

AAC&U	Association of American Colleges and Universities
ACTE	Association for Career and Technical Education
CAD	Computer Aided Design
CCTC	Common Career Technical Core
CNC	Computer Numerical Control
CTE	Career and Technical Education
DL	Distance Learning
GED	General Education Diploma
HE	Higher Education
HVAC	Heating, Ventilation, and Air Conditioning
NASEM	National Academies of Sciences, Engineering, and Medicine
NAVE	National Assessment of Vocational Education
NWCCU	Northwest Commission on Colleges and Universities
PTC	Professional Technical College
PTE	Professional Technical Education
PTI	Professional Technical Institution
TL	Transformative Learning
TLT	Transformative Learning Theory
TVET	Technical and Vocational Education and Training
VE	Vocational Education
VET	Vocational Education and Training
VocEd	Vocational Education

Preface

This project focuses on education for the skilled trades, now commonly called Professional Technical Education (PTE) in the United States. There are many past and present names for PTE. Near the turn of the 21st century, institutions began renaming vocational education to *professional technical education* or *career and technical education*. This was done in part as an attempt to improve its image (Catri 1998, Kerka 2000). Throughout the dissertation I use PTE and CTE (Career and Technical Education) interchangeably, recognizing both as modern names of Vocational Education. The literature defines them both as institutions that focus on career placement in the skilled trades and applied sciences (Great Schools Partnership 2014), and it seems to be just a matter of preference whether the programs are referred to as PTE or CTE. The following terms will be used to describe the various institutions and technical education:

- Professional Technical Education (PTE)
- Career and Technical Education (CTE)
- Technical and Vocational Education and Training (TVET)
- Technical Education (TE)
- Vocational Education (VE)
- Professional Technical College (PTC)
- Professional Technical Institution (PTI)
- Tech School or College
- Trade School

Professional Technical Education definition and purpose

Professional Technical Education provides students with skills necessary for performing certain jobs in the skilled trades or applied sciences. One key purpose of PTE is 'to equip people with the technical and professional skills needed for socio-economic and industrial development of the country' (Geremew, 2018:1). The skilled trades require specific training which may be obtained by formal schooling in a PTI or, depending on the field, by on-the-job training such as an apprenticeship. Students may not always need a formal degree in order to work in their chosen trade.

Professional Technical Colleges are institutions of higher education that teach the knowledge and skills needed for careers in the skilled trades, applied sciences, and technology. PTCs might be confused with community colleges as they are both relatively affordable schools that offer programs typically two years in duration. While PTCs focus on job training for a specific career, community colleges, or junior colleges, typically offer associate's and transfer degrees.

Some professional technical careers require a certificate or a degree in order to work in the field, such as nursing and civil engineering technology. In this study, I chose to focus on programs that do not require a degree from a formal educational institution in order to obtain work. These programmes are more often subject to the stigma around skilled trades and the quality of technical schooling. Nurses, for example, are typically held in higher esteem than auto mechanics. Examples of skilled trade persons considered for this study are carpenters, brick masons, electricians, welders, tile setters, mechanics, machinists, and collision repairmen.

People who work in the skilled trades are called craftsmen/women, artisans, technicians, or skilled trade workers. References herein to any of these terms refer to people who are taught skills in order to perform a particular job. They are used interchangeably throughout this dissertation. Unless specifically quoted, I will attempt to avoid inequalities in nomenclature amongst educational paths between two and four-year tertiary schools. I consider them all to be schools of higher education. In order to distinguish colleges and universities that offer bachelor's degrees and graduate school, I will refer to them as 'four-year' schools.

Chapter 1. Introduction and rationale

1.1. Introduction

> Go to a cocktail party. Listen to the happy chitchat as proud parents describe their teen or college age kids' exciting professional, business, or academic career training. And then see what happens when a parent drops the phrase 'technical training' or, even worse, 'vocational education' into the conversation. Jaws drop; silence pervades (Brady 1999:41).

In 1999, Brady perceived there to be a popular assumption that vocational education is for less intelligent or academically disengaged students, and jobs in the trades are less desirable compared to white collar jobs. Almost twenty years later, Kimberly Green wrote of the barriers to high quality career and technical education:

> The first is the stereotype and reality of vocational education that still exists across our country – a dumping ground for low-achieving students, those not "college material," or other students disenfranchised because they live in a particular part of town or look a certain way. The other barrier is perhaps even more challenging; The systems and structures in place that keep CTE siloed and separate (2016:np).

This study aims to challenge these assumptions by exploring transformative learning in a professional technical college. Transformative learning is both a theory and practice of adult education that encourages learners' viewpoints to be more open, discriminating, and diverse (Mezirow 1991). It is well studied in adult higher education. Should it also be present in professional technical education, this work may challenge lingering negative perceptions and encourage a shift towards a more inclusive and positive attitude regarding technical education and the skilled trades.

1.2. Background and impetus for the study

My dad is a retired auto body repairman. His career was spent fixing cars, but his talents extended far beyond collision repair. He built everything from toy boxes to home additions. Decks, patios, parade floats, furniture, motorcycle parts, and much more has been crafted by his hands. He could weld, wire, sculpt and hammer. My sister has a drawing of his on her wall; a knick-knack he whittled

sits in my living room. His work has won awards (though he would never tell you that himself), and his craftmanship is held in high regard by friends and co-workers. Because of him, I enjoy a positive and noble perspective of craftspeople. My father was a machinist and he was also, in my mind, an artist. For any blank slate, pile of wood and steel, or crumpled mess, he could envision the finished product and set about bringing it to fruition. Either by nature or nurture, when met with something like a broken appliance or furniture need, he is favored with the cognitive and kinesthetic capabilities to figure it out.

I grew up admiring my dad, enjoying his wit and talents. Despite not going to college, he is articulate and intelligent. Calm and equable, his side of any dialogue was typically less than half the total word count of the conversation. What he did say was often accompanied by an eye-twinkle, sprinkled with good natured sarcasm and a dash of profanity. Indeed, a well-timed expletive during one of his tales could send my sister and I into wide-eyed fits of giggles, privy to some imagined secret mischief.

When I was old enough to judge such a thing, I understood my dad to be 'good'. Not only was he talented, hardworking, honest, and fun, he had a keen understanding of the world. He knew how to listen. Sometimes he would comment, other times he would nod in understanding, not necessarily agreement. His rhetoric, or lack thereof, is the result of years of visible results of his work speaking on his behalf, or 'manual competence' (Crawford 2009:15). Matthew Crawford articulated this notion I hold of my father:

> The satisfactions of manifesting oneself concretely in the world through manual competence have been known to make a man quiet and easy. They seem to relieve him of the felt need to offer chattering interpretations of himself to vindicate his worth. He can simply point: the building stands, the car now runs, the lights are on. Boasting is what a boy does, because he has no real effect in the world (2009:15).

My dad encouraged me to learn a trade, believing that regardless of my academic achievements, if the economy was suffering there is always work for skilled tradespeople. During summers between my pursuit of a bachelor's degree, I worked as an apprentice electrician with my older brother. Here I witnessed condescension from stakeholders towards the electricians, pipefitters,

and carpenters. I was confused and offended by their behavior, coming to understand the donning of a suit instead of a toolbelt, in their minds, somehow made them better. Without knowing us, they passed judgment based on our jobs. Their opinions, and similar opinions I came to learn many held regarding the trades, stood in juxtaposition to what I knew about artisans and I was saddened when my co-workers shrugged it off because they were used to it. I found it disrespectful. Clearly these people did not know my dad.

Fifteen years after my summers as an apprentice electrician, I returned to university to earn a master's degree in Education while working full-time and pregnant with my fourth child at the age of 35. It was here I learned of Jack Mezirow and his witnessing of his wife's transformation upon returning to college. Perhaps Mezirow's dimensions of adult learning fit well with me because it made sense of my own situation in education. It was also here I was introduced to Malcolm Knowles and andragogy, and while admitting as a student I found comfort in a good lecture, I can certainly vouch for the increased retention and transfer of learning after a discussion or relay of experience, especially when coupled with intrinsic motivation. As Knowles writes:

> Adults are motivated to learn as they experience needs and interests that learning will satisfy; therefore, these are the appropriate starting points for organizing adult learning activities (Knowles 1990:31).

Having found a passion for adult education I went on to further my studies. In the midst of life events made more worrisome in light of having children, a job, and trying to earn a degree, I became aware of my own cognitive and behavioral transformation. I simply didn't view the world as I once did, or perhaps I was finally paying more attention than I had been before. It was during this time, and in conversations with my father, I saw his reflection, critical thought, self-actualization, and raised conscious. I began to wonder about some of these traits within the idea of transformation, and whether transformative learning was exclusive to higher education. Again, my father was posed as a contradiction, first in contrast to public perceptions of skilled crafts persons, then embodying elements of transformation without a university degree.

1.3. Policy and liberal education

Twenty years ago, James Brady published the introductory quote above in *Tech Directions* magazine where he shared 'the frustrations of trying to change the public's image of technology and vocational education programs' (Brady, 1999:41). Since then, there have been several policies, programs, and political actions aimed at improving recruitment and attendance in these programs to meet economic demands. The 2004 *National Assessment of Vocational Education* by the US Department of Education reported on vocational education since the 1998 passage of the Carl D. Perkins Vocational and Technical Education Act (Perkins III) and found that the 13% of students who take both academic and vocational courses may have better outcomes than those who take one or the other, and the earning benefits for students extend to those who are economically disadvantaged (US Dept of Education 2004).This report also recognizes that:

> Vocational education has long been stigmatized as for the 'noncollege bound' or as a deterrent to college, although NAVE finds that neither of these concerns is well founded (2004:7).

In 2012 the US Department of Education took a more proactive approach to CTE publishing *Investing in America's Future: A Blueprint for Transforming Career and Technical Education* stating that 'CTE represents a critical investment in our future' (2012:1) as the US is ranked 9th and 16th worldwide for college enrolment and degrees awarded, respectively. This report was published two months after President Obama proposed a new education spending budget 'heavily focused on boosting vocational training' (Simon, 2012).

In 2015, the United Nations Educational, Scientific, and Cultural Organization published its third book in the *Education on the Move* series titled *Unleashing the Potential: Transforming Technical and Vocational Education and Training*. Then in 2018 the US Department of Education hosted the Rethink CTE Summit to expand on *The Strengthening Career and Technical Education for the 21st Century (Perkins V) Act* passed in August of 2018 and began implementation in July 2019. These were aimed at enhancing the quality of education and attendance at trade schools due at least in part to a shortage of skilled trades workers:

> Perkins V will provide nearly $1.3 billion to states, school districts, and community colleges this year alone for career and technical education initiatives. The new law gives local leaders greater freedom and flexibility than ever before to decide how best to use the federal investment in CTE to prepare young people and adults for careers (US Department of Education 2019:np).

In the last five years CTE has been receiving increased attention due to the shortage of workers in the skilled trades. Rosen, Visher, and Beal (2018:iii) calls it a 'revival' and Green (2016:np) refers to it as a 'renaissance'. However, despite high job placement, growing salaries and the comfort of job security in a time of global competition for knowledge workers, since 'you can't hammer a nail over the internet' (Blinder 2006:121), the social stigma surrounding vocational education persists. In the 2018 Johns Hopkins School of Education policy brief, Al Passarella reviewed programs that have potential to create better career opportunities, stating that 'ambivalent public perception' (2018:35) is a barrier to effective CTE.

These policies strive to promote CTE in a context where liberal education has been a highly valued tradition in the United States since colonial times (Elias and Merriam 2005). The Association of American Colleges and Universities (AAC&U) defines liberal education as follows:

> Liberal education is an approach to learning that empowers individuals and prepares them to deal with complexity, diversity, and change. It provides students with broad knowledge of the wider world as well as in-depth study in a specific area of interest. A liberal education helps students develop a sense of social responsibility as well as strong and transferable intellectual and practical skills such as communication, analytical and problem-solving skills, and a demonstrated ability to apply knowledge and skills in real-world settings (nd:np).

In an online 'Statement on Liberal Education' the AAC&U also wrote:

> We experience the benefits of liberal learning by pursuing intellectual work that is honest, challenging, and significant, and by preparing ourselves to use knowledge and power in responsible ways. Liberal learning is not confined to particular fields of study. What matters in liberal education is substantial content, rigorous methodology and an active engagement with the societal, ethical, and practical implications of our learning. The spirit and value of

> liberal learning are equally relevant to all forms of higher education and to all students (nd:np).

This view is not new, as Elias and Merriam state:

> With the emergence of science and growth of the new industrial society after the Civil War, the debate between the defenders of liberal education and the advocates of a more progressive and pragmatic education grew more intense. Secondary education became more vocational oriented as the curriculum expanded to include vocational and life-related subjects (2005:23).

After World War II, especially in the colleges and universities, there was a 'redirection of educational efforts toward the liberal tradition' that has endured today (Elias and Merriam 2005:24).

A liberal education system should empower students and promote honest, intellectual work. However, I would argue that vocational and liberal education are perhaps less of a dichotomy and more of a larger tradition of education that supports the freedoms and power of the learner to choose their path. Though there has been a political and economic push for skilled artisans (Rosen, Visher, and Beal 2018, Holzer, Linn, and Monthey 2013, US Department of Education 2012) and favorable information published about the cost of school, job placement, and average incomes, perceptions linger that vocational education is not as valuable intellectually as liberal education. To this I offer a thought: perhaps the idea of vocational education as 'a dumping ground' (Lucas 2009:2343) for the academically disengaged and disadvantaged non-college bound (Jordan and Dechert 2012) is due in part to assumptions of limited potential for intellectual development in PTE. Perhaps the perceptions of skilled trade workers as second-class citizens (Weingarten 2014) cannot be elevated by higher pay and better job security because the stereotype plaguing them as unintelligent isn't affected by economic need. Campaigns promoting PTE solely for economic reasons do not address questions of the intrinsic value of education in the liberal tradition.

1.4. Implications of negative perspectives of PTE

I am concerned that students who have a genuine interest in a career in the skilled trades are finding themselves either in, or pressured towards, a four-year

post-secondary education. I believe this happens due to negative perceptions of PTE schools and student stereotypes, and an incorrect assumption that the four-year path is the only route to success. Vocational students are often viewed, even to themselves, as un-academic. Research shows that those encouraged towards technical training are largely students who were not successful in high school or suffered behavioral problems (Lucas 2009).

The Great Schools Partnership notes that in the United States:

> Career and technical education is often stigmatized, and there is a widespread perception that career and technical centers provide a lower quality education or that students who attend such schools are less capable or have lower aspirations. … There is no concrete evidence that such generalized perceptions and stereotypes are valid, and many studies have shown that students enrolled in career and technical programs can and do outperform students in more traditional academic settings (2014).

The perception of skilled trade work being less valuable, less desirable, and fit for the less intelligent, compounded by the idea that success is tied to a college diploma, causes people of influence in students' lives to promote a four-year education path over other career options that may be more suitable to the student. Mark Phillips, professor emeritus of secondary education at San Francisco State University, wrote:

> I'm sure that most of you who teach high school have had some students confide that what they enjoyed doing most is working with their hands, whether on car engines, electrical circuits in the house, hair, or doing therapeutic massage. I bet that many of these students also confided that there is no way they can tell their parents that they'd rather pursue one of these options than go to college to prepare for a professional or business career (2012:np).

From professional and personal experience, my concern is that people are going to college who would rather have gone to trade school. For decades the four-year college education has been advocated as the post-secondary path for success (Gross and Marcus 2018). 'College became the ticket to the middle class, the be-all-and-end-all of K-12 education. If you didn't go to college, you'd failed' (Samuelson 2012:np). Regardless of the student's interests, they are experiencing social pressure (Ravitch 2012) towards a university path. This

pressure for high school students to pursue a four-year degree after graduation comes from Governments (Samuelson 2012), parents (Alexander 2018) and high school career guidance counselors (Gross and Marcus 2018). The reasons for the almost exclusive push towards higher education are both for the expectation that it will result in an ideal livelihood, and other options such as vocational schooling are viewed as 'second-rate program(s) for students tracked out of a four-year college' (Jackson and Hasak 2014:35).

In 'Not your father's shop class: Bridging the academic-vocational divide', Mike Rose cites great thinkers such as Plato and Aristotle characterizing craftsmen as uncultured and traces these thoughts to today's 'bias against manual and service work that runs deep and wide in our social and institutional life' (2014:13). Regarding the notion that practical knowledge holds less merit than 'deliberative and philosophical' (2014:13) thought, Rose goes on to say:

> This sense of deficiency affects, and distorts, everything from education and job training to the way work is organized – and is ultimately tied to the institutionalization and development of curriculum tracking and to the place of vocational education in that tracking system (2014:14).

Another aspect to consider is that during the college timeline, whether returning to school or immediately following secondary education, students are, or are becoming, adults. As adult learners, the student's interest and motivation to learn are key andragogical principles (Knowles 1990) in their educational success. Wlodkowski wrote:

> In his discussion of andragogy, Malcolm Knowles provided two assumptions that add to our understanding of adult motivation: (1) Adults have a self-concept of being responsible for their own lives…[and] develop a deep psychological need to be seen and treated by others as being capable of self-direction, and (2) Adults become ready to learn those things they need to know to cope effectively with their real-life situations (2008:97).

Self-directed learning is one of the main principles of adult learning (Knowles 1990) and describes students leading the identification of their own learning needs and goals. This initiative is a factor in the student's success. The action of promoting the four-year education route based solely on secondary academic success without regard for truly student-centered and self-directed

opportunities seems to me to be flawed. Sending students to a university without passion or drive may at the very least, waste their time. Sending them to a vocational school with a sense of failure since they did not go to a four-year college is also discouraging. There is a need to continue transforming the negative perceptions of PTE, it's students, and the careers that follow so students may pursue their best post-secondary option.

1.5. Purpose of the research

As mentioned, applying principles of self-directed and transformative learning after reading about Knowles and Mezirow in my own education sparked an interest, based on my experience working in the trades, of vocational education in juxtaposition with prevailing values of adult liberal education in the United States. I do not hold vocational education as being siloed, cut-off from supposedly more noble forms of adult education. Rather I view all formal means of adult and higher education as equal options that make up the whole of liberal education. The talents, desires and passion of the learner should be the primary factor in choice of which path to pursue. I focus in this thesis on transformative learning as a potential means to consider PTE *as* higher education.

Transformative learning is a respected theory in adult education, but there is relatively little research on it in PTE. The purpose of this study is to explore whether or not transformative learning is present in Professional Technical Education, and if so, is it implicit or explicit? PTE is often the last resort for a failing student. It is the undesired fallback plan. I wished to see if I might challenge such assumptions by exploring transformative potential in a case study professional technical college.

There is still a perception that PTCs are second-rate and for the less academically able, compared to a four-year college education. This idea persists despite high job placement, livable wages, job satisfaction, economic need, and the security that comes with these jobs in contrast to 'knowledge' sector jobs that can be done overseas for less money. This perception may mean that academically successful young men and women interested in the trades feel pressure to go to a four-year college rather than attend vocational education. Gross and Marcus reported that 'high school graduates have been so effectively

encouraged to get a bachelor's that high-paid jobs requiring shorter and less expensive training are going unfilled' (2018:np). They go on to say the 'State Auditor found that good jobs in the skilled trades are going begging because students are being almost universally steered to bachelor's degrees'(2018:np).

Transformative learning enjoys a strong reputation in theory and practice for its presence in higher education. Wang and King view transformative learning from a Confucian perspective and state the goal of self-realization is 'not only mirrored in Mezirow's theory but also another widely popular Western educational psychology theorist Maslow's self-actualization' (2011:np). Transformative teaching and learning qualities, if present in PTE, provide an argument contrary to the disrespectful attitude that stubbornly lingers today.

My first aim was to determine if known teaching methods for transformative potential were woven into the professional technical teaching environment at a case study college, then by interviewing students, explore whether or not they have experienced transformation.

1.6. Significance of the study

The significance of this study is twofold. A quick search finds a great deal of literature on both the economic need for, and perceptions of, students and workers in the skilled trades. Additionally, there is much literature and research on transformative learning in undergraduate and graduate programs, (Mezirow 1975, Moore 2005, Glisczinski 2007, Brock 2010, Yeboah 2012, Christie et al. 2015, Halupa 2017, and Quillinan et al. 2019). However, I could find relatively little in the literature regarding transformative learning specifically in PTE (Magro 2009, Cranton 2012, Lavrysh 2015). This research will add to the small body of literature on transformative learning in PTE, and hopefully alleviate some of the prejudice. If this work could plant a seed of convictional transformation whereby secondary counselors broaden the options considered in light of the student's self-directed educational and career interests, it would be of considerable value.

Mike Rowe works to reinvigorate the skilled trades because 'we the people have convinced an entire generation that a whole category of critical vocations are

simply not worth pursuing' (2016:np). Both Rowe (2016) and Crawford (2009) recognize the job satisfaction for having produced or repaired. Somehow artisanship and the sense of satisfaction it brings has been downgraded as less worthwhile than white collar work. Jean-Jacques Rousseau, discerned two types of inequality amongst humans; one established by nature and one a moral or political inequality which 'consists of the different privileges which some enjoy to the prejudice of others' (1984:77). I believe that the derogatory perceptions of professional technical education have created an inequality based on the incorrect notion that higher education enhances intellect, whereas professional technical education does not.

Despite a shortage of skilled trades workers in the United States (Gray and Bae 2009, Barrow 2013, Van Hampton 2013) and strong earning potential (Kavilanz 2012, Picchi 2013), trade jobs go unfulfilled. Perhaps more students would pursue the trades as a career if this was recognized as an honourable choice in its own right. The importance of the study is for the well-being of students whose interests lie in the trades and the communities they support, and to garner respect and inclusion of PTE. As transformative learning has earned respect worldwide, evidence of its presence may shift current perspectives towards a more positive view of vocational education. This could empower students to choose their education based on personal strengths, goals and values. TL has been studied in higher education (Christie et al. 2015, Quillinan et al. 2019, Halupa 2017), nursing programs (Kear 2009, 2013, McCall 2018), and other prestigious fields, but relatively little has been examined in professional technical education in those skilled trades that do not require a certificate or degree for employment.

1.7. The research questions

The research questions are:

- Are transformative teaching and learning approaches present in a case study professional technical college?
- If present, is it explicit or implicit?

These questions address the research problem by exploring the possibility that the assumptions of PTE and skilled trades people as unintelligent, are incorrect. Mezirow wrote:

> Learning occurs in one of four ways: by elaborating existing frames of reference, by learning new frames of reference, by transforming points of view, or by transforming habits of mind (2012:84)

The ability to learn, in this regard, requires reflection and awareness. In order to answer the research questions, I interviewed faculty and students at a professional technical college using a qualitative approach. Merriam and Kim note that 'most studies of transformative learning to date have employed a qualitative research methodology' (2012:56). This is likely due to Mezirow's initial research being qualitative and based in grounded theory (Merriam and Kim 2012). Cranton and Taylor wrote:

> Transformative learning theory is based on the notion that we interpret our experiences in our own way, and how we see the world is a result of our perceptions of our experiences (2012:5).

To this end, an interpretivist perspective is taken in addressing the research problem via the above questions. Discussed in detail in chapter four, I conducted a thematic analysis of the data and was careful to ensure rigor and trustworthiness of the interpretations.

1.8. Limitations

The focus on transformative learning through an interpretivist lens will help me explore the issues above from the perspective of the research participants. However, I acknowledge my obviously strong feelings towards the subject. Whilst I represent the participant's voices as accurately as I can, I realize there is a risk that my own views may shape the interpretations. I avoid this by framing the research questions to explore transformative learning techniques and presence according to the participants, and also through the rigor of the thematic analysis.

This research is a study of twelve participants in a professional technical college in the Pacific Northwest region of the United States that practices a cohort

structure in its programs. The location and programming structure make it unique. The college in this case, is a 'bounded system' (Gay, Mills, and Airasian 2009:426), which identifies in research as a case study. Limitations of case studies are in their immediate applicability to other entities. Case studies do however, provide understanding to others working in similar institutions and be of interest to those working in similar fields since they explore the data in real-life environments (Zainal 2007).

1.9. Structure of the dissertation

This dissertation is structured into seven chapters. The introduction provides the background, motivation and purpose for the research. It introduces the research questions, the rationale behind how these questions address the problem.

In chapter two, I present existing literature, both academic and mainstream media, on key concepts assumed prior to the research: the purpose of education, self-directed learning, andragogy, aims and perceptions of vocational education. The purpose of the literature review is to better define the scope of the problem and establish a foundation for the research upon which to grow.

The third chapter is on transformative learning. While it began as part of the literature review, due to the extent it is applied in this research, it warrants its own chapter. First, I explain what Transformative Learning Theory is, a brief history, and key elements; critical reflection and perspective transformation. I then present evidence from the literature about why transformative learning is desirable in higher education. Finally, I discuss transformative teaching and learning in practice.

Chapter four describes and justifies the research methodology and design undertaken for this study. It begins with a brief discussion of research paradigms and how the interpretive paradigm is the most appropriate framework for this study. I then address issues of quality and trustworthiness. Next, the literature review methods are presented. This chapter includes the ethical approval process for both the University of Glasgow and the steps taken with the case study college administration. Included in this chapter are the logistical steps of contacting the school, defining the participant pool, and arranging the

interviews. A discussion of semi-structured interviews is included. Finally, the methodology chapter culminates with a description of the thematic analysis conducted.

The findings are presented in chapters five and six. Chapter five provides an introduction and portraits of each of the participants. The results of the thematic analysis from the interview data are presented in chapter six. This chapter also introduces a key element in the findings that was not anticipated prior to the research; cohorts. A brief review of the literature on the cohort method of teaching is done at this juncture, rather than going back and artificially adding it to the literature review.

Chapter seven is the discussion, recommendations and conclusions based on the findings and how they respond to the research questions, whether or not transformative teaching and learning are present in professional technical education, and what that might mean regarding public perceptions and stigma. Here I also highlight the uniqueness of this topic to the field where there was relatively little research on transformative learning exclusive to professional technical education. In this chapter I address transformative potential and the broader context of unspoken perceptions.

1.10. Looking ahead

Elements and indications of transformative learning theory are explored at a case study professional technical college so that, if present, they may be indications of intellect and challenge the stigma surrounding technical education. Interviews were conducted with twelve participants and the data was thematically analyzed. In drawing out themes it became apparent that the process of transformation is not linear. While significant relationships in education, for example, may foster transformation, getting into that relationship took motivation. The relationship then may lead to a reward, which in turn motivates the individual. This look ahead at the data is to set the stage for a circular process that creates opportunity for transformation. The initial step is unique to the learner.

Chapter 2. Literature review

2.1. Purpose of reviewing the literature

Reasons for reviewing existing literature are: to articulate understandings of adult education, the skilled trades, and transformative learning, and to review existing research on the topic of transformative learning in professional technical education. In this review I will also include evidence of public perception by the mainstream media. Prior to beginning the literature review, I identified broad topics, such as the purpose and perceptions of vocational education, then let the literature prompt a trail of inquiry appropriate to exploring the information. Having defined areas immediately related to the research topic, I made decisions regarding what was relevant.

Chris Hart defines a literature review as follows:

> The selection of available documents on the topics which contain information, ideas, data and evidence written from a particular standpoint to fulfil certain aims or express certain views on the nature of the topic and how it is to be investigated, and the effective evaluation of these documents in relation to the research being proposed (1998:13).

This chapter is structured as a narrative literature review which summarizes and synthesizes literature by theme, while also critiquing and drawing conclusions or noting gaps. It is a critical analysis of published literature that provides current knowledge about topics being researched (Rother 2007). I chose to do a narrative review because it 'provides more potential for individual insight and opportunities for speculation' (Bourhis 2018:1076). This allowed greater flexibility to include related topics which resulted in a broader picture of the literature applicable to this research.

To provide contextual understandings for the study, I began by exploring the aims of education, especially for adult learners, then the aims and history of PTE. Next is a review of media perspectives on vocational education. Following this is a review of andragogy and self-directed learning, relevant as the participants are all adult learners and self-directedness is linked to transformation (Merriam 2001). Finally, I reviewed literature specifically on

transformative learning in professional technical education. The aim is to consider how the mission and purpose of vocational education fits within current directions of education in the United States, and present literature on successful adult education and self-directed learning as it applies to adult learners.

2.2. The purpose of education

> The purpose of education has always been to every one, in essence, the same – to give the young the things they need in order to develop in an orderly, sequential way into members of society. Any education is, in its forms and methods, an outgrowth of the needs of the society in which it exists (Dewey 1934:1).

Widely held to be the most influential American educator for his pragmatic approach to education, Dewey recognized societal influence on educational aims, while also encouraging critical thinking and reflection as core to the purpose of education. Dewey also wrote:

> It is [the business of education] to cultivate deep-seated and effective habits of discriminating tested beliefs from mere assertions, guesses, and opinions; to develop a lively, sincere, and open-minded preference for conclusions that are properly grounded, and to ingrain into the individual's working habit methods of inquiry and reasoning appropriate to the various problems that present themselves. (1910:23).

A singular purpose exists in a specific condition, while habits of the mind and habits of learning extend beyond the classroom. Dewey wrote of critical thought in liberal education. The purpose of education is not to draw out the regurgitation of timely facts and manners expected to form the individual into someone else's mould. Students should also critically consider the reasons behind lessons. Nussbaum (2010) believes the critical examination of traditions is essential to democracy. A liberal education should not only encourage but require critical thought of oneself and the social environment, including the purpose of one's own education if it is to succeed in its attempt 'to lead persons from information to knowledge to wisdom' (Elias and Merriam 2005:28). In a diverse society with many different needs to be served, education must do more than teach rote facts. As Foshay writes:

> The one continuing purpose, since ancient times, has been to bring people to as full a realization as possible of what it is to be a human being. Other statements of educational purpose have also been widely accepted: to develop the intellect, to serve social needs, to contribute to the economy, to create an effective work force, to prepare students for a job or career, to promote a particular social or political system. These purposes offered are undesirably limited in scope, and in some instances, they conflict with the broad purpose I have indicated; they imply a distorted human existence. The broader humanistic purpose includes all of them, and goes beyond them, for it seeks to encompass all the dimensions of human experience (1991:277).

Foshay sees temporary purposes as limiting the achievement of an individual's full potential. However, these specifically purposed activities are also valid, especially in childhood education. There are reasons for logistical immediate-purposed education. Sometimes it is beneficial to postpone reflection and critical thought: practical education is just as critical as teaching people how to think, for it lends a means to experience the present and practice the latter. In order to question or think critically about something, one must first have an understanding and context. One must know what politics is, for example, before being able to think critically about it.

Nearly twenty years before Foshay's words above, Ammons stated that the purpose of education 'has changed from that of producing a literate society to that of producing a learning society' (1964:15). The purpose of education changes over time. It might be for the 'training of good mental habits' (Dewey 1910:12), to develop youth into members of society (Dewey 1934), teach people to think intensively and critically (King Jr 1947), cultivate 'sympathy and benevolence' (Nussbaum 2006:409), or to 'become critically aware of one's own tacit assumptions' (Mezirow 2012:74).

2.3. Aims of CTE

The purpose of career and technical education centers primarily around practical skills and knowledge needed for future jobs and careers.

> Career and Technical Education (CTE) provides students of all ages with the academic and technical skills, knowledge and training necessary to succeed in future careers and to become lifelong learners (Advance CTE 2019).

Vocational schools 'typically offer relatively short, career-focused programs that quickly prepare graduates for the workforce' (Study.com 2019:np). The mission and vision of the case study PTC is futures-minded and focused on student-centered workforce development. The Association for Career and Technical Education's (ACTE) mission is 'to provide educational leadership in developing a competitive workforce' (2019:np). The case study PTE is in one of forty-two states that have signed a declaration of support for, and participated in, the development of the Common Career Technical Core (CCTC). 'The goal of the CCTC is to provide students with the knowledge and skills needed to thrive in a global economy' (Advance CTE 2019:np) The standards for the CCTC are in response to the transition from CTE programs 'helping students prepare for an individual job to helping students prepare for a career' (Advance CTE 2019:np). Technological advances in the skilled trades are such that if the student only learned to perform the tasks associated with today's workforce, many would soon find their skills outdated. The difference is in learning to perform a particular job, versus learning skills needed to advance in a career.

2.4. History of CTE

For most of its history in the US, expertise in skilled trades such as carpentry and blacksmithing was learned during apprenticeships whereby the apprentice, an individual new to the skill, received on-the-job training from a master. The Massachusetts Bay Colony passed a law in 1642 that required parents and master craftsmen to educate children primarily to help them resist Satan (Travis nd:np). Following the American Civil War, African Americans such as Booker T Washington attended the Hampton Normal and Agricultural Institute believing that 'the best way for freed slaves to gain equality was by gaining money, wealth and respect by working hard in technical trades' (Travis, nd:np).

The Industrial Revolution brought the onset of mass production and the increased rate of technological advances. Early in the 20th century 'factory owners were facing a shortage of skilled labor in a rapidly industrializing society' (Hanford 2014:np) at the same time public schools were growing with immigrants and children of displaced farmers. Previously, the secondary schools had smaller groups of primarily privileged students from educated families in

preparation for university. The solution of what to do with these new students was vocational education (Oakes 2005). The Smith-Hughes Act of 1917 brought Federally funded vocational training to the public schools. The beginnings of formal vocational education include freed slaves, immigrants, and displaced farm children.

Despite economic and social need for valuable skills, vocational education was developing a poor image based on the lack of quality education and perceptions of who attended such programs. In comparison to a university bound education, it became assumed that vocational education was for the less intelligent since it wasn't on track toward a four-year institution. As labor journalist Hoerr commented:

> Since the early days of industrialization, a peculiar notion has gained ascendancy in the United States; that wage workers and their representatives lacked the competence to handle complex issues and problems that required abstract knowledge and analytical ability (Rose 2014:13).

Legislation in the 1960s expanded vocational education to include new trades such as health care and attempted to address discrimination and stereotyping. At this time, students were tracked to vocational education and it was on its way to becoming 'a kind of dumping ground for kids who weren't succeeding in the traditional academic environment' (Hanford 2014:np). Mike Rose wrote of his own secondary education experience:

> When I was in high school in the 1960s, the curriculum was split into 3 tracks; an academic or college preparatory track, a general education track, and a vocational track. Students were placed in one of them based on their previous academic records or a measure of ability, typically an IQ score. I swear, looking back on it all, the college-prep crowd walked around with an air of promise. Their course of study was the place of smarts and big ideas while the voc-ed crowd inhabited the domain of the manual, the concrete, the gritty (2014:13).

Though tracking was criticized for discriminating based on race and socioeconomic status, the result was not in favor of vocational education, but rather increased attention on preparing all kids for a four-year college (Wyman 2015:np). The 1980s saw a significant increase in students headed to

universities, encouraged by parents based on the 'belief that a four-year college degree will secure their child's place in the shrinking middle class' (Gray 1997:24).

The Perkins Act, first passed in 1984, was legislated to increase the quality of technical education in the United States. Improving the quality of CTE is important to ensuring graduates of CTE programs had the skills needed to continue to be successful in a technologically advancing workplace. However, by the late 1990s, 'vocational education had a major image problem' (Hanford 2014:np). At the turn of the 21st century it was becoming apparent that it wasn't just an image problem, there were economic issues on the horizon as well:

> The impending critical shortage of highly trained and skilled employees throughout many industries, coupled with a declining enrollment in vocational education courses does not bode well for the future of the American economy (Haney 2002:2).

The Perkins Act has been reauthorized in 1990, 1998, 2006, and 2018. Policy and legislation continue to promote CTE. It is now acknowledged that the push to a four-year that began in the 1980s is not paying off economically. Regarding global competition and the incorrect assumption that the highly educated would have more security, Ian Jack wrote, 'at some point in the short history of our post-industrial complacency it now looks as though we got the future of work fundamentally wrong' (2009:np). In reality, trades jobs require a face-to-face presence with the work, while jobs that can be done online can be done from anywhere, including where the standard cost of living is lower. Additionally, many steady, well paying, local jobs simply do not require a four-year degree. In her blog, educational historian and Research Professor of Education at New York University, Diane Ravitch wrote:

> According to the Bureau of Labor Statistics, most of the jobs that will open up in the next few years do not require a BA. In fact, only about 25% do. We should be preparing students for a variety of vocations and let them know it is honorable to build a house, to install plumbing and electricity. And we should do that as we fulfill the basic function of public education, which is to prepare them to vote, to serve on juries, to be the citizen who sustain our democracy into the future (2012:np).

In a continued effort to dismantle the negative perceptions of vocational education, the name has changed. The 2018 Perkins Act specifically includes what has been known as 'vocational education' is instead now called 'career and technical education'. Perkins V is a comprehensive act for improving CTE more so than previous versions. It allocates 1.2 billion dollars in support of CTE programs across all 50 states. The purpose of Perkins V is as follows:

> The purpose of this Act is to develop more fully the academic knowledge and technical and employability skills of secondary education students and postsecondary education students who elect to enroll in career and technical education programs and programs of study, by—
>
> (1) building on the efforts of States and localities to develop challenging academic and technical standards and to assist students in meeting such standards, including preparation for high skill, high wage, or in-demand occupations in current or emerging professions;
>
> (2) promoting the development of services and activities that integrate rigorous and challenging academic and career and technical instruction, and that link secondary education and postsecondary education for participating career and technical education students;
>
> (3) increasing State and local flexibility in providing services and activities designed to develop, implement, and improve career and technical education;
>
> (4) conducting and disseminating national research and information on best practices that improve career and technical education programs and programs of study, services, and activities;
>
> (5) providing technical assistance that - (A) promotes leadership, initial preparation, and professional development at the State and local levels; and (B) improves the quality of career and technical education teachers, faculty, administrators, and counselors;
>
> (6) supporting partnerships among secondary schools, postsecondary institutions, baccalaureate degree granting institutions, area career and technical education schools, local workforce investment boards, business and industry, and intermediaries;
>
> (7) providing individuals with opportunities throughout their lifetimes to develop, in conjunction with other education and training programs, the knowledge and skills needed to keep the United States competitive; and
>
> (8) increasing the employment opportunities for populations who are chronically unemployed or underemployed, including individuals with disabilities, individuals from economically disadvantaged families, out-of-workforce

> individuals, youth who are in, or have aged out of, the foster care system, and homeless individuals (Perkins V 2018).

Today, 'about 12.5 million high school and college students are enrolled in CTE across the nation' (Advance CTE 2019:np). The poor public perception is recognized and being actively addressed, for example: 'Of the $200 million California is spending on vocational education, $6 million is going into a campaign to improve the way people regard it' (Gross and Marcus, 2018:np).

The purpose of CTE, in addition to teaching a trade, is to educate for the betterment of the individual, specifically in terms of sustaining a successful career. The aims of PTE apply as an avenue for meeting the needs of society (Dewey 1934) and for personal development. The shift in CTE from teaching someone to do a specific job to teaching someone to advance in a career requires an openness to lifelong learning, intrinsic motivation, and self-directedness in order to succeed. Rapid technological changes in the trades demand that CTE students today be able to adapt and continue to learn in order to keep up with the future of their fields. It is no longer, if it ever was, a siloed education.

2.5. Perceptions

2.5.1. A poor image

A perception of technical education as less valuable, prestigious and desirable than four-year college programs stubbornly persists in spite of efforts to improve the quality and image of CTE. Near the turn of the century much attention was directed to vocational education's image problem. It was considered by some to be the biggest issue in CTE, and the stereotypes were bluntly stated in the media:

> Ask a vocational educator to name the most serious issues facing the field today, and most will rank 'our image problem' high on the list. For years vocational-technical educators have been saying they are tired of feeling like their program is the poor stepchild of the school system – dissed by the counselors, stiffed by the school board. They tire of the false stereotypes sometimes used to depict their students: kids who can't cut it academically, the non-college bound, misfits (Gale Group 1997:14).

Catri also comments:

> These are hard times for secondary vocational education. Leaders of the new school reform movement do not give it high priority. They assume that it is separate from general education, has little educational value, and should be replaced by a predominately academic curriculum. At best, vocational courses are expected to provide students who are not college bound with minimal training for low-status jobs at entry level (1998:np).

It was at this time that many schools began changing their names from Vocational Institutions to Professional Technical Colleges. 'The reasons varied but the one most often cited was public image: negative baggage associated with the word 'vocational' (Ries 1997, Catri:1998:np). Perkins V, as mentioned above, legislated the change to 'Career and Technical Education' in 2018, and the effort continued. 'Colleges are changing their name to avoid the public stigma attached, to avoid being stereotyped as a vocational school' (Gross and Marcus 2018:np).

It does seem as though there is a sense of improvement in attitudes towards trade education, as long as it's not applied directly to oneself or one's children. The last decade revealed a slight shift in attitudes and tolerance of CTE itself, though the stereotypes remain regarding who should attend technical colleges. In a 2012 study regarding public perception of CTE in conjunction with the Mississippi Department of Education respondents indicated that CTE benefits everyone when asked directly, but this changed when asked to describe the types of students that benefit from CTE.

> Respondents described students who lack academic capability, who are poor, or who are not college bound. Over and over again, respondents described students who were disadvantaged in one way or another as the target population, revealing their underlying assumption that the CTE approach is most suitable for students with no other options (Jordan and Dechert, 2012:np).

2.5.2. Influences and consequences

Despite the job market need for skilled trades workers, the value placed on white collar jobs casts a shadow on other lines of work, even though evidence shows the availability and incomes of work in the trades. A 2019 article by St.Esprit shares a mother's reservations regarding her son attending technical

school. The assumption is those that do pursue VE do so because they weren't able to enroll in a four-year college. Her son, who had a 3.95 GPA in high school (on a 4.0 scale), was more interested in a program at the technical school than other options. After touring the school, she began supporting her son's decision, but still heard negative feedback from others. She related this exchange:

> I ran into a friend recently and as we were catching up, I mentioned that my eldest had decided to go to the vocational technical school in our city. Her first reaction was 'Oh, is he having problems at school?' There is an attitude that the only reason you would go to a vo-tech is if there's some kind of problem at a traditional school. (St.Esprit 2019:np).

Despite the attitude, perhaps some progress has been made as St.Esprit's relay of this story is not as aggressive as twenty years prior when Brady wrote of 'millions of paranoid parents who absurdly continue to regard the words technical and vocational with a mixture of fear and loathing' (1999:41). He went on to say:

> Until the day when those parents talk about 'my son or daughter the technician' with the same sparkling eyes and pride and resolve as when they say 'my son or daughter the doctor, the lawyer, the banker, or the professor' America will continue to be in big trouble (1999:41).

As a primary influencer on a student's tertiary education, many parents are still encouraging a four-year degree. They resist evidence of good jobs and economic stability 'because there is that stigma of the six-pack-totin' ironworker' (Gross and Marcus 2018:np).

> We live in a society that places a high value on the professions and white-collar jobs, and that still considers blue-collar work lower status. It's no surprise that parents want their children to pursue careers that will maintain or increase their status. And for most teachers, if a student is academically successful, this will be seen as a 'waste of talent' (Phillips 2012:np).

Teachers and high school guidance counselors also play a part, sometimes shaming students into technical school. In 'Keeping it real', Dubin shared an eighth-grader's experience of his teacher telling him 'he should work with his hands because he is not college material' (2014:20). The idea that a four-year

degree is the best path to success after high school has further rendered technical college, falsely, a failure.

The almost exclusive push for all students to get a four-year degree resulted in an excess supply of bachelor's degrees and a lack of degrees and certificates for working in the skilled trades. Generations of students have been directed to a four-year degree resulting in 'a shortage of people who can build the offices the college-bound aspire to work in' (Caldwell 2012:np). While this comment prompts me to point out there is much more reason to learn a trade than provide shelter for college bound students' aspirations, it is a good point regarding the gap left in the trades, eluding to the overabundance of four-year graduates. 'In this economy, a college degree means nothing and everything at the same time' (Ryan 2013:np). White collar jobs typically require at least a bachelor's degree, but the market appears so saturated with them that it's hard to get a job in one's field of study. Many graduates are instead 'resorting to the kinds of entry level jobs they went to college to avoid' (Watson 2012:np).

2.5.3. A global issue

CTE's poor image and economic challenges are not exclusive to the United States. Much of the same sentiment above is echoed worldwide. Kasim and Fachriah (2018) reported that some in Indonesia still consider it a second-class education. The negative perception of Technical Vocational Education and Training (TVET) in Ethiopia 'equates academic education with intelligence and TVET lack of intelligence' (Geremew 2018:8). Geremew (2018) also points out that many attending TVET in Ethiopia do so after being unable to attend a four-year institution, stigmatizing them as failures. Similarly, in England, Lucas (2009) reported that students were directed to technical education based on academic underachievement. Attendance at technical schools is low in Nigeria due to poor public perception (Edet 2013), and in Egypt, Rabie wrote of the need to change perceptions in order to address the shortage of trades workers due to the 'low social status and lack of prestige connected to technical jobs' (2012:np).

Worldwide, regardless of the need for educated and competent workers in the skilled trades, technical education is unfortunately viewed as the undesirable

back up plan. The students are incorrectly perceived to be less intelligent than four-year students by association. Notwithstanding policies in place for decades, high demand, competitive wages, and secure jobs, the perceptions persist.

Despite the reported shortage of skilled trades workers across the globe, there is no shortage of media literature claiming the need to change the perceptions of vocational education, citing improved CTE programs and comfortable wages. Weingarten (2014) points out that research shows CTE programs are successful, but there are still biased attitudes of CTE as a prescription for second-class citizenship. 'Some of what plaques CTE is an image problem still tarnished by the perception of it as an education track for students who should not attend college' (Jackson and Hasak, 2014:36). These 'Negative attitudes and misconceptions persist even in the face of the positive statistical outlook for the job market for these middle-skill careers', (St-Esprit 2019:np). The economic arguments to change perceptions of CTE are not addressing the different assumptions between theoretical and practical knowledge, and the idea that people who work with their hands are less intelligent than their four-year counterparts.

2.6. Adult Learning

Having discussed the purpose of education and the background of CTE, I now look specifically at adult education, beginning with a brief overview of what the typical adult learner looks like, then moving on to andragogy and self-directed learning.

Adult learners are equal parts male and female, have typically completed high school, are married with children, work full-time and have an above average income (Merriam and Brockett 2007). There has been an increase in adults returning to school over the last decades that is likely to be due to 'rapid changes in technology and the job market' (Kopka and Peng 1993, Merriam and Brockett 2007:131). Most often, adult participation in education is related to job and career aspirations, but there are many reasons including 'social relationships, external expectations, social welfare, professional advancement, escape/stimulation, and cognitive interest' (Morstain and Smart 1974, Merriam and Brocket 2007:132). Adults are responsible for their actions, so naturally

motivation is a factor in why and how they select an educational program. Motivation 'is critical to learning and achievement across the life span in both informal settings and formal learning environments' (NASEM 2018:109). Adult learners gain opportunity for success with purpose, responsibility, and motivation. Wlodkowski wrote:

> Responsibility is the cornerstone of adult motivation. Almost all cultures hold adults more responsible for their actions than they do children. For adults this is an inescapable fact. This deep social value for responsibility is why competence, being effective at what one values, looms so large and so consistently as a force for learning among adults (2008:96-97).

Increasing competence is a primary motivator for adult learners, especially as it applies towards obtaining a particular job or learning a new skill. 'In order for students to be motivated, it is important for them to have a goal, to believe they can achieve that goal, and to believe the environment is facilitative of that goal' (Gordon Rouse 2001:468). Adult learners also have a history of experiences and life events they are responsible for managing. Navigating their education may require resilience while they attend school in light of these life events. Andragogy pays special attention to the unique learning motivation and circumstances of adults.

2.6.1. Andragogy

Andragogy refers to methods and practices of teaching specific to adults. At its impetus, the first proponent of the term, Malcolm Knowles, 'viewed andragogy as the polar opposite of pedagogy' (Merriam and Brockett 2007:135). Criticism of Knowles' dichotomy between andragogy and pedagogy caused Knowles to instead view them on a continuum (Merriam, Caffarella, and Baumgartner 2007). While there may be students at the case study college who are younger than eighteen, the average age is 32, and all of the participants of this study are legally considered adults by design, so my focus in this section is on how adults learn, as described in andragogical concepts of teaching and learning.

As Knowles writes, adults have

> a deep need to be self-directing, therefore, the role of the teacher is to engage in a process of mutual inquiry with them rather than

> to transmit his or her knowledge to them and then evaluate their conformity to it (Knowles 1990:31).

Malcolm Knowles proposed the term 'andragogy' in 1968 first as an educational theory then later, following criticism, as a conceptual framework regarding 'the art and science of helping adults learn' (Merriam, Caffarella, and Baumgartner 2007:84). It is based on the following six assumptions, as taken from Knowles' *The adult learner: A neglected species*, 4th edition:

> 1. The need to know. Adults need to know why they need to learn something before undertaking to learn it. Tough (1979) found that when adults undertake to learn something on their own they will invest considerable energy in probing into the benefits that will gain from learning it and the negative consequences of not learning it.
>
> 2. The learners' self-concept. Adults have a self-concept of being responsible for their own decisions, for their own lives. Once they have arrived at that self-concept they develop a deep psychological need to be seen by others and treated by others as being capable of self-direction.
>
> 3. The role of the learners' experience. Adults come into an educational activity with both a greater volume and a different quality of experience from youths. It means that for many kinds of learning the richest resources for learning reside in the adult learners themselves.
>
> 4. Readiness to learn. Adults become ready to learn those things they need to know and be able to do in order to cope effectively with their real-life situations.
>
> 5. Orientation to learning. In contrast to children's and youths' subject-centered orientation to learning (at least in school), adults are life-centered (or task-centered or problem-centered) in their orientation to learning. Adults are motivated to devote energy to learn something to the extent that they perceive that it will help them perform tasks or deal with problems that they confront in their life situations. Furthermore, they learn new knowledge, understandings, skills, values, and attitudes most effectively when they are presented in the context of application to real-life situations.
>
> 6. Motivation. While adults are responsive to some external motivators (better jobs, promotions, higher salaries, and the like), the most potent motivators are internal pressures (the desire for increased job satisfaction, self-esteem, quality of life, and the like). (1990:57-63)

Andragogy is a model geared towards adults that 'involves the whole person, emotional, psychological, and intellectual' (Elias and Merriam 2005:134). The six assumptions are key components of a successful adult educational program. As self-directed adults, choices in education and learning strategies are driven by the student: 'The learning climate must be supportive, cooperative, informal, and in general, cause adults to feel accepted and respected' (Elias and Merriam 2005:133).

Critics of Knowles challenge andragogy as a theory and consider the six assumptions more as descriptions of adult learners (Merriam, Caffarella, and Baumgartner 2007). He also neglects historical and social contexts of education. Merriam, Caffarella, and Baumgartner point out:

> Knowles reliance on humanistic psychology results in a picture of the individual learner as one who is autonomous, free, and growth oriented. There is little or no awareness that the person is socially situated, and to some extent, the product of the sociohistorical and cultural contexts of the times; nor is there any awareness that social institutions and structures may be defining the learning transaction irrespective of the individual participant (2007:88).

Nevertheless, 'andragogy has been the primary model of adult learning for over forty years' (Merriam, Caffarella, and Baumgartner 2007:90). It has had a dramatic effect on how educators understand adult students and creating learning environments more open to the diversity of self-directed learners. These are important points for this study as the participants are adult learners. This foundation of what successful adult learning should look like will offer a useful comparison with the behaviors and activities shared by the participants in this research

2.4.2. Self-Directed Learning

Since 1975 when Malcolm Knowles formally introduced the concept of self-directed learning to the world of education it has been interpreted and applied in many different ways as both a characteristic of learners and a teaching strategy goal (van der Walt 2019). Along with andragogy, Sharan Merriam (2001) refers to self-directed learning as one of the pillars of adult education.

The original definition by Knowles (1975) of self-directed learning is quoted in Brookfield (1994) as follows:

> In its broadest meaning, self-directed learning describes a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes (1994:np).

Closer to the present, these words echo in the literature from professional learning in a number of fields. For example, 'all health care professionals are expected to be self-directed learners, in which the individual takes responsibility and uses their own initiative to direct their learning activities' (Sandars and Walsh, 2016:151). And even more recently Jeff Cobb wrote a list of traits of successful lifelong learners, in which the first point is that being a successful learner takes initiative:

> This first one is core to the entire concept of 'self-directed.' The successful self-directed learner does not wait for someone else to say, 'you must learn this.' Rather, she is intrinsically motivated toward self-learning (2019:np).

Merriam, Caffarella, and Baumgartner (2007) discuss progressive instructional models based on the learner, which show opportunity for the type of education allowable, culminating in the self-directed learner. This is easily envisioned in the progression from elementary through secondary and beyond within the United States education system:

> Stage 1: Dependent learner: Learners of low self-direction who need an authority figure to tell them what to do
>
> Stage 2: Interested learner: Learners of moderate self-direction who are motivated and confident, but largely ignorant of the subject matter to be learned
>
> Stage 3: Involved learner: Learners of intermediate self-direction who have both the skill and the basic knowledge and view themselves as being both ready and able to explore a specific subject area with a good guide
>
> Stage 4: Self-directed learner: Learners of high self-direction who are both willing and able to plan, execute, and evaluate their own

> learning with or without the help of an expert (Merriam, Caffarella, and Baumgartner 2007:117).

Brookfield points out that self-directed learning is approved by both liberal and radical educators. Among reasons for its favor is it the epitome of the entrepreneurial spirit and 'ultimate educational expression of capitalist ideology (Brookfield 1994:np). When the student takes a self-directed approach to learning the teacher becomes the facilitator, rather than the sole deliverer of knowledge, by allowing the student a stronger hand in their own means of learning. This viewpoint has received criticism for lessening the role of the teacher and the value of their expertise. Nasri conducted a study in Malaysia on teacher perspectives of self-directed learning and said:

> While the majority of research participants reported that they provide various learning opportunities to support their learners' DL skills, nonetheless, almost all research participants were not comfortable abandoning their roles as authority figures in learning (2017:7).

However, as Brookfield wrote in 1994;

> Most adult educators who stand behind the concept of self-direction do so because they sense that there is something about this form of practice that dignifies and respects people and their experience, and that tries to break with authoritarian forms of education (1994:np).

In other words, self-directed learning is about respecting the student, not disrespecting the teacher. He goes on to say: 'Honouring people's self-direction is not the same as abandoning one's convictions and purposes as an educator in a mistaken act of pedagogic abnegation' (Brookfield 1994:np). The teacher is an expert resource to the self-directed learner, and the facilitator towards learning beyond the classroom.

Another criticism is regarding the idea of the independent learner. Sandars and Walsh have reservations considering mandatory training and revalidation requirements (2016). In this manner, support from a facilitator is beneficial until the learner is also self-regulated. They conclude that:

> Self-directed learning for healthcare can be effective and achieve its intended aim of improving healthcare but the learner also needs to become an autonomous self-regulated learner (Sandars and Walsh 2016:152).

Cobb writes, 'self-directed learners do not always act autonomously, they must cultivate their networks to learn effectively' (2019). There is a need to collaborate with peers and identify expert resources in order to be a successful self-directed learner (Knowles 1975, Caffarella and O'Donnell 1987). In studying self-directed research, Brookfield noted that learners consulted their 'particular network or learning community' as best able to advise their academic progress (2009b:2617). Even in its beginnings self-directed learning was not intended to be a lone venture. According to Merriam the goals of self-directed learning are:

1. the development of the learner's capacity to be self-directed,
2. the fostering of transformational learning which posits critical reflection by the learner as central to the process, and
3. the promotion of emancipatory learning and social action, (2001:9).

Clearly the second goal regarding transformational learning is relevant to this study and indicates evidence of intrinsic motivation and self-direction should be evaluated in the data. Brookfield makes an important point when he writes:

> When the techniques of self-directed learning are allied to the adult's quest for critical reflection and the creation of personal meaning after due consideration of a full range of alternative value frameworks and action possibilities, then the most complete form of self-directed learning is exemplified. This most fully adult form of self-directed learning is one in which critical reflection on the contingent aspects of reality, the exploration of alternative perspectives and meaning systems, and the alteration of personal and social circumstances, are all present. The external technical and the internal reflective dimensions are fused when adults come to appreciate the culturally constructed nature of knowledge and values and when they act on the basis of that appreciation to reinterpret and recreate their personal and social worlds. In such a praxis of thought and action is manifested a fully adult form of autonomous, self-directed learning (1995:30-31).

I find Brookfield's words on autonomous self-directed learning, critical reflection, and the pursuit of meaning above inspiring in terms of this study because the participants are teaching and learning in an environment that historically has been perceived to be less desirable than other forms of

education. For the participants to experience PTE for themselves and find value in their education and careers, empowers them and sets them apart, in a sense, from the negative perceptions and those that maintain such viewpoints. Taylor (1998) discusses emancipatory education as an outcome of transformative learning theory and the inherent link to social power. The empowered view of those who are transformed may then, eventually, encourage a shift in public thought away from the poor image vocational education has been subject to for decades.

2.7. Transformative learning in PTE

A search of transformative learning in vocational education primarily resulted in resources discussing the need to transform VE; re-name it, revive it, and bring it back to the secondary education curriculum. In looking specifically for TLT in any form of adult vocational education I found two sources. In 2009 Karen Magro published *Transformative learning theory and TVET*, and in 2012 Patricia Cranton published *Spiraling into transformative learning*. Both of these discuss the need for transformation in education from a social and critical perspective, the possibilities of transformative techniques in technical education, and what the instructors could do to promote transformation in their students.

Magro begins by recognizing the need for a workforce capable of 'continuous change and lifelong learning' (2009:2661). She goes on to describe transformative learning theory and how the benefits of TL lend towards meeting both the economic needs and improving social justice. Indeed, the ideas of transformative learning theories 'have been applied to social and environmental movements' (Magro 2009:2662). Life events often facilitate a yearning for further education, and the changing nature of the technical trades requires a lifelong learner.

> Occupations in technical and vocational settings challenge individuals to be lifelong learners, open to keeping up with current trends and applying and transferring skills to new contexts (Magro 2009:2663).

Cranton's (2012) notion of spiraling into transformation initially appears as if transformation in technical environments occurs as happenstance. In posing very

personal examples of transformative experiences, she views the need for transformation through a critical theory lens.

Understanding the nature of technical education, both authors present ways in which transformative learning strategies and techniques could be employed in a vocational learning environment. Technical education is ripe with opportunities for critical thinking and problem-solving skills. They provide advice to educators to reflect on their teaching, and tactics to employ in the classroom and shop that may lead to transformation such as mentoring and art-based projects. Cranton concludes with:

> Any technical skill has the potential to lead to transformative learning. As educators, we need to be aware of these possibilities, recognize the moment they exist, and do our best to challenge and support learners as they move into a different realm of learning (2012:9).

2.8. Summary

Cynical views of VE and the skilled trades are real and global, and they have an effect on who attends technical schools. These views persist despite higher pay, job security, and government efforts to encourage students into the trades. Job placement opportunities in the skilled trades have yet to overcome the popular idea that the four-year route is the only route to success. This stigma is contrary to the purpose of adult education, which is achieved via andragogical self-directedness in education. PTE, especially with recent attention to the quality of schools and career promotions, is offering strong opportunities for adult learners to pursue a quality education towards a successful career path. This study will add to the currently limited literature on transformative learning in vocational education. It is interesting to note that in the existing literature, both Magro (2009) and Cranton (2012) acknowledge that technical education can and should be a place for transformation.

Chapter 3. Transformative learning

Transformative learning can be described as *teaching for change* (Taylor 2009). This chapter explains what transformative learning is and provides background on its origins. Discussion is then offered regarding the practice of TL and why it is a desirable goal in education.

3.1. Introduction

TLT was developed in the late 70s by Jack Mezirow 'urging us to recognize, reassess, and modify the structures of assumptions and expectations that frame our tacit points of view and influence our thinking, beliefs, attitudes, and actions' (2009:18). I believe Mezirow was urging teachers and students towards transformation, as both are learners. A goal of transformative education is to challenge learners' assumptions and encourage them to think using a broad range of perspectives. This is done by creating an environment that facilitates and inspires the learner to critically reflect on their own beliefs about what is being learned. Carter states that transformative learning 'is an "opening up" to new experiences' (2017:11). Transformative learning theory has changed over the past four decades. Baumgartner wrote:

> Since 1975, Mezirow's theory has evolved from a rational process grounded in a particular context, with reference to concepts from psychology and critical pedagogy, to an increasingly holistic theory infused with ideas from Jurgen Habermas's (1971) conception of critical theory and open to the importance of emotion, context, intuition, and relationships in the transformative learning process (2012:110).

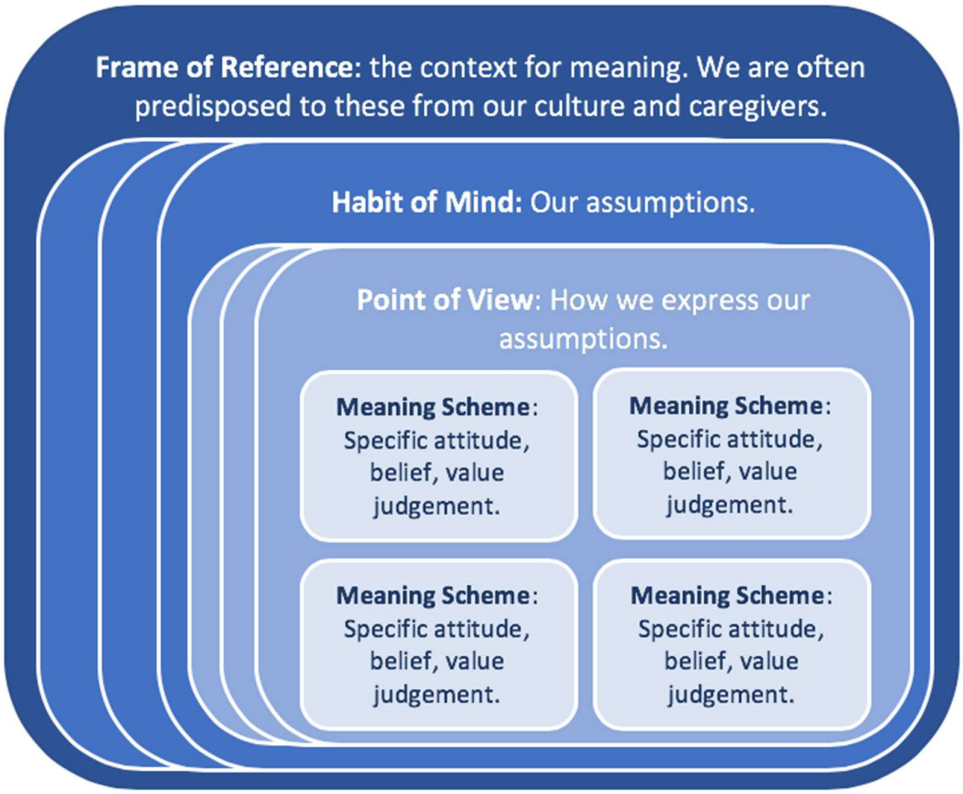
The following is a list of terms and definitions regarding transformative learning, that are helpful in understanding this chapter.

- **Meaning Structures** – Meaning structures are experiential interpretations that are made up of frames of reference, habits of mind, and points of view (Carter 2017).
- **Frames of reference** – 'A frame of reference is the structure of assumptions and expectations through which we filter sense expressions' (Mezirow 2012: 82). They often come from our culture, language, and traits of our caregivers (Carter 2017). 'A frame tells us the context of a social situation and how to understand and behave in it' (Mezirow 1991:47).

- **Habit of mind** - 'A habit of mind is a set of assumptions- broad, generalized, orienting predispositions that act as a filter for interpreting the meaning of experience' (Mezirow 2012:83).
- **Point of view** – 'A Habit of mind becomes expressed as a point of view' (Mezirow 2012:83).
- **Meaning schemes** – 'Meaning schemes are habitual, implicit rules for interpreting experiences' (Cranton 2016:18). They are our attitudes, beliefs and value judgements (Carter 2017).
- **Critical Reflection** – Reflection is the action of thinking deeply and taking time to seriously consider something. Critical reflection 'connects reflection explicitly with social and political purposes and ideology critique' (Kreber 2012:324). It is the means for changing habits of mind (Carter 2017) which in turn may transform frames of reference.

Carter (2017) states that points of view are changed more easily than habits of mind. She makes an important distinction in understanding the difference between Habits of mind and points of view by explaining that 'habits of mind are transformed when we become critically reflective of the *premise* of a problem' (Carter 2017:np). On the other hand, 'points of view are transformed by critical reflection on the content of a problem' (Carter 2017:np).

Figure 3.1: TLT Meaning Structure – The lighter the element, the easier to change.



3.2. Transformative Learning Theory

Transformative learning is the process of interpreting and re-interpreting experiences according to different perspectives, especially in critical reflection of one's own assumptions, that results in a revised worldview. The transformation may be a psychological, convictional, and/or behavioral (Mezirow 1991, Pappas 2016). It is 'the process of effecting change in a frame of reference' (Mezirow 1991:5). The foundation of transformation theory is 'the way in which individuals make meaning of their experiences' (Merriam and Brockett 2007:140) that is cause for change in the individual learner. TLT is the set of principles that guide and explain transformative teaching and learning. It 'reflects a particular vision for adult education and a conceptual framework for understanding how adults learn' (Dirkx 1998:1).

Mezirow began defining TLT in a 1978 national study regarding the increasing number of women attending higher education in the United States. This was prompted after witnessing changes in his wife, Edee, upon her return to school in 1975 (Kitchenham 2008, Cranton 2016). He 'found her dramatically transformative experience, which led to a new career and lifestyle, both fascinating and enlightening' (Mezirow 1991:xvii). Transformation in the manner experienced by the Mezirows is the result of critical self-reflection and the cognitive ability to adjust one's own perspectives as inspired by an experience that does not readily fit into existing beliefs or behaviors (Mezirow 2009).

In the process of growing up, we assimilate, often uncritically, ideas and perceptions from our culture and the people around us. These establish our frames of reference and are made up of any number of opinions and viewpoints. In adulthood, we grow out of some of them, while others are challenged. Opportunities for transformation occur when we have an experience that does not fit into one of our existing frames. In his early work, Mezirow identified ten phases of the transformative process (Mezirow 2009:19):

1. A disorienting dilemma
2. Self-examination
3. A critical assessment of assumptions

4. Recognition of a connection between one's discontent and the process of transformation
5. Exploration of options for new roles, relationships, and action
6. Planning a course of action
7. Acquiring knowledge and skills for implementing the plan
8. Trying new roles
9. Building confidence in the new roles and relationships
10. Reintegration into life based on the new perspective

These steps aim for a shift or broadening of one's frames of reference. They were not the final draft: in the more than forty years since its introduction, TLT has developed to encompass more than these original ten steps (Mezirow, 2009) involving a more complex array of psychological and social phenomenon.

Early influences on the development of transformative learning theory were Freire (1970) and Habermas (1984). Mezirow (1991) wrote of Freire's influence on the development of TLT in the early 70s regarding consciousness raising.

> Humankind emerge from their submersion and acquire the ability to intervene in reality as it is unveiled. Intervention in reality – historical awareness itself – thus represents a step forward from emergence, and results from the conscientização of the situation. Conscientização is the deepening of the attitude of awareness characteristic of all emergence (Freire 2000:109).

Mezirow recognized this was missing in his own teachings and was applicable to the 'community development process' he'd been striving for (1991:xvii). In teaching and learning, methods wherein students become dependent on the teacher for 'the gift of knowledge' (Kitchenham 2008:107) cause an absence of free thought, and thereby put the learner at risk of social, political, and economic oppression (Freire 1970). Freire also insisted that education should extend beyond the classroom into all parts of the learner's life (Kitchenham 2008). In reflection on Freire's work, Mezirow wrote:

> The critical dimension missing from my work had been my lack of awareness of both the centrality of conscientization in the learning process and of the importance of entrenched power in the community development process I had attempted to foster (1991:xvi-xvii).

While pointedly denying association with some of Habermas's roots, Mezirow (1991) was influenced by his early work on learning domains (Kitchenham 2008). In *Knowledge and Human Interests*, Habermas wrote:

> While instrumental action corresponds to the constraint of external nature and the level of the forces of production determines the extent of technical control over natural forces, communicative action stands in correspondence to the suppression of man's own nature. The institutional framework determines the extent of repression by the unreflected, "natural" force of social dependence and political power, which is rooted in prior history and tradition (1971:53).

There seem to be similarities here in terms of Mezirow's instrumental and communicative learning, and in the existence of frameworks and critical reflection. Although Habermas defined three learning domains, Mezirow highlights two as core concepts to transformative learning theory: instrumental learning and communicative learning (Mezirow 2012). Instrumental learning is 'learning to control and manipulate the environment and other people' and communicative learning is 'learning what others mean when they communicate with you' (Mezirow 2012:77). Considering an experience that doesn't immediately fit in an existing frame of reference, we

> establish the validity of our problematic beliefs in instrumental learning by empirically testing to determine the truth of as assertion. In communicative learning, we determine the justification of a problematic belief or understanding through rational discourse to arrive at a tentative best judgement (Mezirow, 2012:78).

Understanding learning domains in TLT is important as most learning involves both domains and transformation may be prompted in either one (Mezirow 2012). Cranton states that transformative learning:

> is defined as the process by which people examine problematic frames of reference to make them more inclusive, discriminating, open, reflective, and emotionally able to change. It can be provoked by a single event – a disorienting dilemma – or it can take place gradually and cumulatively over time (2016:27).

Our frames of reference are made up of habits of mind (Carter 2017), which are expressed as points of view. As a constructivist phenomenon (Cranton and Taylor

2012, Carter 2017), the reality of any one perspective is based on the interpretations of individual's experiences. Therefore, our frames are defined based on years of family, social, and cultural influence, much of which was never questioned. Lack of a developed frame of reference, such as in youth, avoids a dilemma. So, it is in adult education where transformative learning is more likely to occur.

I will now look at some of the key elements in transformative learning before moving on to purposes of TL.

3.2.1. Critical Reflection

Critical self-reflection is key to transformative learning. Reflection is to think deeply, critical reflection is to question 'values, assumptions, and perspectives in the world' (Cranton 2016:74). The 'critical' in critical reflection socially purposes the act and gives greater cause to transformative learning.

> Critical reflection is reflection which enables an understanding of the way assumptions may be socially restrictive, and thus enables new, more empowering ideas and practices (Fook 2010:40).

Boud offers a summary relating ideas of reflection closely to transformative learning theory principles, noting that reflection stems from questioning experiences as in Dewey's (1933) 'state of perplexity' and in Mezirow's (1991) 'disorienting dilemmas' (Boud, 2010:26). Reflection often occurs when there is 'some puzzling, or troubling, or interesting phenomenon with which the individual is trying to deal' (Schon 1991:50).

According to Schon (1991), reflection can be a deep and rigorous process: in order to shift a frame of reference, one must critically examine and reflect upon their assumptions. Brookfield reminds us this isn't always easy:

> Paradigmatic assumptions are examined critically only after a great deal of resistance to doing so, and it takes a considerable amount of contrary evidence and disconfirming experiences to change them (1995:3).

After critical reflection becomes a habit, learners are faced with the realization that there are no final or 'neat solutions waiting to be found for difficult

problems' (Brookfield 1995:239). But it is not all discomfort: critical reflection becomes a habit that breeds emancipatory knowledge (Cranton 2016). While it may be more comfortable in the short run to avoid reflection, the individual power created by this practice is worth the growing pains of transformation.

3.2.2. Perspective Transformation

Perspective transformation to a more inclusive, discriminating, healthier perspective can be the result of successful transformative learning:

> Perspective transformation was explained as a rational process of interrogating our assumptions and then correcting the distortions in our meaning schemes and perspectives (Lawrence 2012:472).

It happens when the learner revises or re-frames their worldview (Carter 2017) following critical reflection on previously untested assumptions of reality. It can happen dramatically, as with a 'disorienting dilemma' (Mezirow 1991), or it can occur gradually over time. In figure 3.1 above, the lighter the shade of the element, the more apt it is to change, but even small changes of attitude may eventually cause a shift in habits of mind, then frames of reference. When this is set in a learning environment where people can critically question their habits of mind in order to become open to alternatives, 'transformative learning theory can be holistic in nature and incorporate both individual perspective transformation and social transformation' (Cranton 2016:82).

3.2.3. Readiness for Transformation

> Adult development is seen as an adult's progressively enhanced capacity to validate prior learning through reflective discourse and to act upon the resulting insights (Mezirow 1991:7).

Mature learners are better suited to transformative learning as they are more able to critically reflect and reconcile discrepancies between their frames of reference and their experiences. But there is more to transformation than age; there must be a willingness and readiness on behalf of both the teachers and learners to engage with transformative processes (Halupa 2017). Brock conducted research on the initial ten steps and concluded they did indeed seem to create a 'fertile field for that change in perspective he defined as transformative learning' (2010:136). Brock also found that critical reflection is

key to the process (2010) but it is not simple. As Cranton states: ‘Even when an educator deliberately sets up circumstances to promote reflection, not everyone or perhaps not anyone will be affected by it’ (2016:48).

The teacher must be willing to relinquish some of their authority as the giver of knowledge in order to create a more democratic learning environment, and the student must be open to change, possibly in the face of discomfort (Cranton 1996, Moore 2005). Transformation requires a suitable learning environment and a willing, self-directed learner (Mezirow 1985, Cranton 2016). Even when the teacher has created an environment to foster critical reflection and transformation, the learner ‘must decide to undergo the process themselves; otherwise we are venturing into indoctrination, manipulation, and coercion’ (Cranton 2016:105). It is also worth noting that challenges and disorienting dilemmas can facilitate transformation, but they may also cause the individual to be defensive, retreat, or to solidify old frames. This is more likely to occur ‘when the trigger raises doubts about central aspects of one’s personal identity’ (Apte 2009:182). To prevent this a trustworthy learning environment with strong relationships is beneficial.

3.3. Purpose of transformative learning

John Dirx acknowledged transformation in education as consciousness-raising, as ‘guided by a desire for political liberation and freedom from oppression’ (1998:3). He wrote:

> Freire argues that education should foster freedom among the learners by enabling them to reflect on their world and, thereby, change it. For Freire, transformative learning is emancipatory and liberating at both a personal and social level (Dirkz 1998:3).

Transformation as consciousness-raising therefore ‘has the potential to transform worldview and behavior’ (Glisczinski 2007:319). Discussing Freire, Mayo argues that ‘we need to engage with the logic of the system’ (2003:43). We learn who we are, develop distinguishing frameworks, how to live in the current systems, and change them from within. A recognition of what is not inclusive and just, and the ability to act, can be very powerful. A more inclusive frame of reference allows greater diversity and acceptance of both the

individual and others. It can also promote individual autonomy and self-actualization (Olson 2013) and help individuals to strive for personal growth (Cherry 2019).

Mezirow also wrote of the application of transformation to democracy and the workplace:

> The essential learning required to prepare a productive and responsible worker for the twenty-first century must empower the individual to think as an autonomous agent in a collaborative context rather than to uncritically act on the received ideas and judgements of others. Workers will have to become autonomous, socially responsible thinkers (1997:8).

Transformation in education is desired as it aids in creating a more inclusive, socially active, self-aware citizenry capable of discerning corruption and working towards a more socially just community. The goal of modifying frames of reference to make them more inclusive is beneficial towards a more open and accepting society.

> Such frames of reference are better than others because they are more likely to generate beliefs and opinions that will prove more true or justified to guide action' (Mezirow 1985, Cranton 2016:18).

It is good for the community and it is good for the self. In their 2019 study, Quillinan et al. looked at transformative learning practices in a 'community capacity building' program (2018:229). The program practiced 'participative learning' in which the 'students learn through activities rather than knowledge transfer' (Quillinan et al. 2019:236). This is similar to the hands-on nature of the professional technical programs. They found the students reported personal change which in turn, bettered the community:

> Students revealed how they shifted from old ways of thinking to a new understanding and appreciation of their personal abilities, supporting the belief that transformative learning can occur through learning activities that highlight student changes in student perceptions (Quillinan et al. 2019:245).

3.4. Transformative learning in practice

> Transformative learning requires a form of education very different from that commonly associated with children. New

> information is only a resource in the adult learning process. To become meaningful, learning requires that new information be incorporated by the learner into an already well-developed symbolic frame of reference, and active process involving thought, feelings, and disposition (Mezirow, 1997:10).

As discussed in section 3.2.3, the teacher may create enriched opportunities for transformative learning, but transformation is self-directed and up to the learner. In this section I outline how the teacher creates a learning environment that may facilitate transformation. Research findings over time promote the need for educators to foster transformative learning (Taylor and Snyder 2012). In fostering transformative learning efforts 'what counts is what the individual learner wants to learn' (Mezirow 2012:93). Educators may help adults explore their frames of reference, learning to 'look at the same experience from a variety of points of view' (Mezirow 2012: 92).

As reflection is key to transformation, teaching and encouraging this enhances opportunities for TL in practice. In order to inspire reflection, there must be a trusted relationship in the learning environment. Relationships are imperative to transformation as it requires broadening of one's own perspectives to include those of others. Freire (1970) argued that for education to be empowering, the teacher needs to not only be democratic, but also to form a transformative relationship between him or her and the students, students and their learning, and students and society. Here I outline four practices that can be employed in the learning environment to foster transformative learning. Opportunity for transformation is ripe when the participants in the learning environment engage in respectful, caring relationships. These relationships create conditions for meaningful discussion which may pose challenges to one's assumptions and habits of mind. When the challenge then inspires critical thought and self-reflection, transformation may follow as the result of broadening one's own point of view or frame of reference.

3.4.1. Foster caring relationships

Both the teacher and learner are of equal value in the learning environment. Relationships in both a more traditional structure and in mentoring as a means to learning, require trust and respect so both parties feel safe and comfortable.

It is important that the learner feels safe and cared for. Simply put, ‘great teachers demonstrate a genuine care for their students’ (Figueroa 2015:71). On her list of five ‘big things’ that transformational teachers do, Briggs (2015) listed ‘always show that you care’.

Academic mentoring, as a way that faculty foster student learning is fundamentally a commitment to entering into dialogue with students, centered on questions and purposes that come from the student (Mandell and Herman 2009:80). Peer mentoring benefits from the same security, and further enhances the learning of the student mentor who is then finding themselves in an instructional role. Mentoring fosters transformation as each participant learns to respect the other’s positions. The closer relationship allows for changes to be made to better meet the needs of the learner: ‘This educational collaboration grows gradually, and but for small moments is often invisible’ (Mandell and Herman 2009:86). The result of a caring relationship in education can be transformational.

3.4.2. Create conditions for dialogue

Trusted, respectful relationships in which the learner feels the teacher cares, create opportunity for fruitful discussion, and plant seeds of transformation. Dialogue is the ‘essential medium through which transformation is promoted and developed’ (Taylor 2009:9), or as Mezirow puts it, transformative learning is ‘rooted in the way human beings communicate’ (1997:10). Transformation may stem from discussions, providing critical thought of the other’s perspective and critical self-reflection on one’s own. In this way, we ‘transform as we socially construct new meanings of self and others through hearing and being changed by each other’s stories and perspectives’ (Shapiro, Wasserman, and Gallegos 2012:365).

Armbrecht, an online learning architect who previously taught literature and philosophy, used both small and large group discussions in his efforts to inspire transformative learning, and practiced the Socratic method of teaching. He believes that in order to experience transformation, ‘adults must draw their own conclusions, preferably after engaging in a substantive exchange among themselves’ (2018:np). Within these dialogues, it’s possible to challenge

assumptions based on learning a different perspective from someone else. 'Often the engagement of differences elicits a disorienting dilemma or dissonance' (Schapiro et al. 2012:365). This event, whether subtle or dramatic, may be the beginning of a transformation.

3.4.3. Challenge assumptions

Early in Mezirow's development of transformative learning theory, 'a disorienting dilemma' was defined as the first phase in perspective transformation (1991:168). The learner experiences something that contradicts or differs from their existing beliefs, and cognitively registers the discrepancy. While the evolution of transformative learning has progressed the nature and sequence of the phases towards transformation, challenging assumptions is still a trigger for critical self-reflection that leads to perspective transformation. In being challenged or having an experience that gives cause to question a viewpoint, 'people become aware of assumptions, make them explicit, consider the sources and consequences, and question their validity' (Cranton 2016:50). The challenge or dilemma is the seed for transformation, nurtured by reflection, resulting from 'a response to an awareness of conflicting thoughts, feelings, and actions and can lead to perspective transformation' (Yeboah 2012:32).

3.4.4. Encourage critical thought

Critical thinking is a foundation of transformative learning. Yeboah (2012) explains that critical thinking is at the core of TL and discusses several ways educators can encourage critical thinking skills, including journaling and experiential learning activities. Carter (2017) suggests educators create situations where students reflect on both the content and premise of a problem' as these two areas affect the meaning scheme and habit of mind respectively.

Taylor lists 'the importance of activities that encourage the exploration and alternative personal perspectives, problem-posing, and critical reflection' as an essential practice and condition of transformative learning (1998:48-49). Brookfield (2009a) encourages critical reflection of his students through modeling and peer learning by posing questions regarding ideologies and power in society, having students read critical theory extracts, and encouraging them

to listen to peers so they may better understand their own perspectives. Brookfield argues that people:

> come to a better understanding of their own assumptions and develop the ability to judge their accuracy and validity only if they involve peers as critically reflective mirrors who provide them with images of how their practice looks to others (Brookfield 2009a:133).

Cranton introduces activities in her teaching for critical self-reflection dependent upon the learners and context: 'key to starting the critical reflection process is to expose people to alternative perspectives' (2009:185). She then uses questioning and role-playing to encourage people to try out alternative perspectives. Regarding encouraging critical reflection, Kreber wrote:

> Further suggestions made in the literature on how to foster critical reflection include, for example, the skillful employment of critical incidents, autobiographies, role play, repertory grids, concept maps, working collaboratively, critical questioning, free writing and journaling, metaphor analysis, and creative/expressive activities such as collages, drawings, or sculpture. Some of these approaches rely principally on confronting participants with the unexpected, unfamiliar, surprising, and perhaps even disturbing, thereby calling into questions the presuppositions they hold and possibly revealing them as "distorted" (2012:330).

Fostering critical reflection in this way invites a dilemma to the learner's attention, then leads them to ponder on it by bringing clarity on their own assumptions in comparison to new ones just experienced. When the individual shifts their frame of reference as a result of reflection in order to expand their perspective towards a more inclusive, justice-minded viewpoint, they've successfully experienced transformative learning.

3.5. Summary

Transformation is not always comfortable, especially when it happens abruptly. Critical reflection often involves problematic experiences and a deep, sometimes embarrassing, look at one self. Consciousness raising is not always liberating, especially when it brings awareness of social injustice without the power to take immediate action. Transformation may not be for everyone everywhere, but it *can* happen to *any*one *any*where:

> Learning how to be a carpenter has as much potential to lead people into a deep shift in the way they see themselves and the world around them as does studying critical theory or exploring childhood traumas through narrative (Cranton 2016:79).

Those open to a keener awareness of truth, their position, and their potential for social action are primed for transformation. As Dirkx states: 'Central to our understanding of transformative learning is the emphasis on actualization of the person and society through liberation and freedom' (1998:8). Transformative learning is about learning to think for yourself rather than accept what others administer without question. However, as Mezirow comments:

> transformative learning is not an add-on. It is the essence of adult education. With this premise in mind, it becomes clear that the goal of adult education is implied by the nature of adult learning and communication: to help the individual become a more autonomous thinker by learning to negotiate his or her own values, meanings, and purposes rather than to uncritically act on those of others (1997:11).

In the midst of the theory and philosophical discussion, it is important to remember that transformation is not exclusive to a population or location. It can be an evolution of thought based on unique relationships strengthened over the course of a technical program. It can happen anywhere the individual chooses to let it:

> Transformative learning does not necessarily require extraordinary events in our lives, nor does it always require that we think deeply and analytically about our beliefs and assumptions. Dramatic opportunities for transformative learning reside in imaginative engagement with the everydayness of our lives (Dirkx 2001:16).

Chapter 4. Research methodology and design

4.1. Introduction and justification

This chapter details the research methodology and tools used to gather evidence to explore whether or not transformative teaching and learning is present in the case study college. A qualitative inductive approach was taken, using semi-structured interviews with instructors, students, and the president at one professional technical college.

First, I present the theoretical framework and justification as the best fit for the aims of this study and offer a brief comparison of the paradigm to others. I selected interpretivism as the most appropriate research framework, although this wasn't without a bit of volleying amongst other paradigms. Next, I discuss issues of quality and trustworthiness considered in ensuring a rigorous interpretivist study. This is followed by an explanation of the methodological approaches taken during a review of the literature, and a discussion of the ethical approval process. I then move to the research design and method development, and the logistics of participant selection, arranging interviews, and data handling. This chapter concludes with an explanation of the inductive thematic analysis method.

4.2. Selecting the research paradigm

A paradigm describes a 'worldview, or thinking, or school of thought, or set of shared beliefs, that informs the meaning or interpretation of research data' (Kivunja and Kuyini 2017:26). To begin, it is worth the reminder that when it comes to educational research and theoretical frameworks, andragogical concepts should not be ignored. There are characteristics that are unique to adult learners and I strived to keep these at the forefront when developing the research design. Key characteristics of adult learners are self-directedness, life experience, learner readiness, and problem centeredness in the present time (Knowles 1990). Additionally, the purpose of education for adult learners is about more than satisfying 'the identified learning needs of individuals, organizations, and society, but they should seek to help adult learners transform their very way of thinking about themselves and their world' (Knowles 1990:98).

Adult learners are self-motivated and have a reason for returning to school, preceded by a series of unique life experiences. This breeds transformative potential, should the opportunity lie in their educational environment. The paradigm I selected had to allow for exploration of a variety of stories and unique human experiences.

In addition, evidence of transformation in PTE could be sought through a straightforward evaluation of the instructional design and teaching methods, but what is less clear is how transformation comes to fruition, if at all, in the student. The need to explore what is, and what isn't, understood in terms of transformation within the participants requires an openness to possibilities, rather than a prescribed set of either-or inquiry. In this same spirit, the methodology and research design are modeled as such to prospect for opportunities of discovery.

4.2.1. Positivism

Positivism assumes that reality exists independently of humans (Rehman and Alharthi 2016). Facts can be discovered through enquiry by scientific method and the researcher is essentially an objective bystander. The ontological assumptions serve a singular truth, and the epistemological stance is of a reality that can be objectively defined.

Whilst I am not exploring perceptions of professional technical education, I do strongly acknowledge they are a driver. The concept of perception, our ways of understanding something, allows for differences in opinion. What one person sees from their point of view is different to that of others, so I question the ability to hold an absolute truth across time and space. Likewise, perceptions of transformation are also subjective. Transformation is present if the person transformed believes it to be so. I therefore ruled out positivism for its short-comings in studying social phenomena due to the 'complexity of laws governing individuals, their idiosyncrasies, their relationship with each other, with institutions and with society' (Rehman and Alharthi 2016:53) being in juxtaposition to a concept that relies upon a singular truth. Positivism lacks the subjectivity necessary for understanding people's stories, and what their experiences mean to them.

4.2.2. Post-positivism

Popper criticizes positivist thought in its struggle with what he called the problem of demarcation: 'the problem of finding a criterion which would enable us to distinguish between the empirical sciences on the one hand, and mathematics and logic as well as 'metaphysical' systems on the other' (Popper 1959:11). Post-positivism emerged as a means for coping with the abstract notions of humanity in the natural world and now appears as a bridge between traditional positivist thought and the more modern interpretivist views. Whilst acknowledging the abstract, post-positivism still abides by a scientific method aimed at identifying an absolute truth and driven by causal relationships. I seek not causation, but transformative potential. Remaining rooted in andragogical assumptions of adult learning, there are numerous factors that may contribute to transformation. What can be identified in teaching may not be directly linked to the presence of transformation in the student.

4.2.3. Interpretivism

> Interpretivism does not see direct knowledge as possible; it is the accounts and observations of the world that provide indirect indications of phenomena, and thus knowledge is developed through a process of interpretation (Waring 2012:16).

Interpretivism rejects the notion that a single, verifiable reality exists independent of our senses (Rehman and Alharthi 2016) and recognizes the researcher as an integral part of the research process. We all have a point of view and the job of the researcher is to understand that of the participant. I therefore sought a framework that made room for participants' perceptions as they reflect realities of PTE.

The methodological framework is interpretivism based on the ontological stance that reality is in the eye or the beholder. The perspectives of PTE identified in chapter two weighed heavily in my choice as the literature suggested that perceptions of reality are often unique to the individual. Because of this, positivist and postpositivist theories do not provide a good framework. My focus is on the potential for transformation of the student in a PTE setting, and for this, an interpretive theoretical framework is the best fit in exploring participants' understandings of PTE and transformative learning.

Interpretivism provides room to explore perceptions. These are not absolute truths but unique to each of us. To explore whether or not evidence of transformation was present in PTE, I conducted qualitative semi-structured interviews scaffolded by interpretive notions of individual reality. Within the interpretive paradigm, semi-structured interviewing synchronized with the research questions as I hoped to understand the participants' stories to evaluate how transformation may, or may not, have been facilitated via professional technical education.

Table 4.1 illustrates how the primary research question might be treated according to each of the paradigms ontological and epistemological assumptions.

Table 4.1. Paradigms and the Research Question

Is Transformative teaching and learning present in professional technical education?				
	Positivism	**Post-positivism**	**Interpretive/ Constructivism**	**Critical**
Ontology What is known.	Single Truth. What are elements of transformative learning.	Critical realism (Rehman and Alharthi, 2016). What is the nature of transformation.	Reality is according to the individual. Transformation is relative to the individual.	Social construction of reality. Transformation is subject to societal factors in any given time and space.
Epistemology How I can know it.	Objective measurement of reality. Survey the curriculum & the students for a baseline, then for elements of transformative learning. How do we know if someone is transformed – looks at causation.		Subjective: Reality is interpreted / constructed based on experiences. The student is transformed if he/she believes so.	Discourse analysis, action research. Transformation is part of the larger cultural, political, etc, influences and must be critically examined according to what groups hold power and influence.
Methods What tools do I use to know.	Quantitative experiments, questionnaires. Measure the students before and after exposure to transformative learning practices – compared to a control group.		Qualitative, interviews, case studies. Semi-structured interviews for the participants stories and perspectives on education, change, and life events.	Focus groups, political actions; Define PTE students as oppressed due to the identified perceptions. Use the focus group to challenge the current standards.

4.3. Quality and trustworthiness

The theoretical framework of the study influences how the results will be evaluated, perhaps not for reliability and validity, but for quality and trustworthiness. Williams and Morrow wrote:

> In any research endeavour, researchers are obligated to justify to the research community that they have done due diligence: that they have established a rationale for the study, a clear description of the data collection procedures and data analytic methods, and a clear description and interpretation of the data (2009:576).

The quality of this study is addressed in the following ways:

1. *Formation of the research questions*. The research questions were specifically designed to inquire about elements of transformative learning as defined by professionals in the field, and the interpretations of the faculty and students. Transformative teaching strategies and learning results are used as indicators to expose potential.

2. *Selection of the paradigm*. Morrow states that 'criteria for trustworthiness are closely tied to the paradigmatic underpinnings of the particular discipline in which a particular investigation is conducted' (2005:251). Trustworthiness is ensured by the thorough and systematic analysis of how the participants viewed their reality.

3. *The data analysis method*. Thematic analysis is a systematic and rigorous analysis method employed to ensure that the findings are clearly supported, or refuted, by the data.

It would be easy to assume I was merely trying to support my own perceptions, and I self-scrutinized in this regard. The paradigm, the methodology and methods were considered and applied with awareness of my personal beliefs and with a focus on my search for my participants' realities. I set out to understand the lives and stories of students and teachers of PTE.

The logic behind the trustworthiness of this study is this:

1. Transformation occurs in thoughtful people, people capable of intellectual growth, in part via meaningful interactions, paradigm challenging moments, and critical self-reflection.
2. The cognitive practices required for transformation, according to TLT, need not be exclusive to a four-year education institution.
3. Should practices that promote transformative learning theory be present in the PTE curriculum, potential for transformation is present.
4. Within the interpretive paradigm, reality is within the view of the individual and how each person defines what *is*, and what *is not*, based on their experiences and how those are interpreted.
5. Therefore, the inquiry explores whether the participants, via their stories, show evidence of transformative teaching and learning.

Validity and transferability are not sought in this study, rather credibility is, based on inductive analysis of the research data. This study is limited to one institution in the pacific northwest region of the United States and may not be applicable directly to other professional technical colleges. Transferability is the extent to which the research is generalizable and applicable to other similar situations.

Williams and Morrow suggest trustworthiness should be addressed in the integrity of the data, the balance of reflexivity and subjectivity, and a clear communication of the findings (2009:577). Balance refers to that between what the participant means and what the researcher interprets. Qualitative researchers may use methods such as bracketing to remain aware of their own biases and perspectives (Williams and Morrow 2009:579). Prior to identifying the research questions, I made note of my own thoughts regarding the research topic. Throughout the analysis process codes and themes were derived as they directly related to the words of the participant, rather than to my pre-existing interpretations. Another test of quality according to Williams and Morrow is clearly articulated findings that are ‘easily understood by the reader and supported by participant quotes’ (2009:580). The findings and discussion chapters present the evidence in relation to the research questions, and an argument is made based on the findings towards changing the perceptions of professional technical education and trades careers.

4.4. Narrative literature review

A review of the literature is an analysis of the current knowledge on a given topic (Baker 2016) with the purpose of compiling a summary of the literature relevant to the research question (Jahan et al. 2016). To this end I considered types of literature reviews then topics relevant to my study. Since I had clearly defined research questions regarding transformative learning theory and assumptions regarding the attitudes and outcomes of professional technical education, I chose to do a narrative review, also known as a general or traditional literature review, to define the scope of the issue and establish a foundation and relevance for the research. Onwuegbuzie and Frels describe a general narrative literature review as: 'a review of the salient and critical aspects of the most current knowledge regarding a topic of interest' (2016:24). The narrative review allows for discussion of topics on a theoretical point of view (Jahan et al. 2016) so I found it more flexible and efficient in this regard. Compiling the data allowed me to see gaps in the literature and inspired further purpose to this research.

Consideration for a historical review was intriguing in terms of the development of transformative learning theory and the background behind why certain perceptions of technical education and work are what they are today. But the narrative review was chosen as it neither limits the timeframe of knowledge, nor requires detail not directly relevant to the student's interpretations of their experiences. An argumentative review was ruled out for similar reasons. Although support for or against current or changing attitudes towards PTE is powerful, I felt I would lose some of the credibility due to my personal perspective and experience with the topic. With such emotional potential, it was best to keep the review straightforward and familiar. As Green et al. state, I sought a 'comprehensive narrative syntheses of previously published information' (2006:103).

4.4.1. Topics for review

I began with some general reading online regarding PTE and from texts I already owned on transformative learning in an attempt to define the topics for review. From this I prepared an initial list of search terms (Hart 1998:32).

Initial topics for review were; the purpose and perceptions of vocational education, and transformative learning theory both as it was developed by Mezirow and discussed by scholars in practice and applicability since 1978. Once examining articles and information on professional technical education it was fitting to locate this in the broader purpose of education. It also followed that more than the aims of professional technical education were relevant, but also some facts and statistics of current economic trends.

Transformative learning as a topic for review blossomed into its own chapter, leaving andragogy and related concepts such as student-centered and self-directed learning in the literature review chapter. It seemed paramount to search for literature specifically focused on transformative learning in vocational education, but this resulted largely in articles related to the transformation over time of professional technical education itself, rather than the transformative potential of its students. I realized this is an important part of my study in that the policies and initiatives for transforming PTE are in an effort to increase attendance to meet economic demands. This drive to increase attendance battles at least in part, the negative perceptions that are keeping students away. Again, I'd circled back to the impetus for the project.

4.4.2. Finding the literature

Having identified the initial topics for review, I began with an online search by terms. Housekeeping at this stage is very important in terms of what and how the topics are searched (Hart 1998:32). Besides 'professional technical education' I also searched for vocational education as the concept was applied to each synonym. For example, when reviewing an aspect of PTE such as the purpose, I search for a variety of terms, for example: *purpose of* and *perceptions of* -

- Professional technical education
- Vocational education
- Career and Technical education
- Technology and Vocational Training

The online search was both on a public browser for books, media, and scholarly articles, and in the university library system. From here I embarked on a path, leaving breadcrumbs, following citations and references in articles that were relevant. Attempting to stay focused and thorough for each topic (and because while searching one topic often related to another; such as reflection in andragogy and perceptions in the purpose or policies of PTE) I often flagged an article to follow up on later.

4.5. Ethical Considerations

4.5.1. Approval

The University ethical approval process for research was completed in full and the ethical approval document is in appendix A. Shortly after contacting the participant college by a letter of introduction (appendix B) I received an email from a Director. The Director was asked by the President to review my request and subsequently had the following follow up questions:

1. In general, what is your methodological framework?
2. Are you hoping to collect data on one or multiple campuses?
3. What is your anticipated timeline for data collection?

I then met with the Director to respond to these and other questions, and to review the ethics documents. At the Directors request, I updated the participant information sheets (appendix D and E) for both the faculty and students, the participant consent form (appendix F) as follows:

- The college and programs/departments shall also not be identified in the study (in addition to the participants remaining anonymous).
- Remove the word “staff” from the documents – use “faculty” only.
- Add a line specific to participants being at least 18 years of age.
- Add a general timeframe regarding the instructor interviews being in the fall/winter and the student interviews being in the winter/spring.
- The PLSs state this it a low risk study as none of the participants are identified as being in a vulnerable population. (from email to College of Social Sciences Graduate School Ethics, November 2016.)

I sent the amended documents back to the University of Glasgow Ethics and Research Student Administrator and enjoyed a very quick re-approval. With fresh documents in hand I visited the college again where the Director signed the

Consent to Conduct Research Form (appendix C) and let me know the President would also agree to an interview.

4.5.2. Considerations

Great consideration was given towards the ethics of this research to ensure the participants were not harmed in any way. I provided them full disclosure of the study and obtained their informed consent before proceeding with the interviews. I ensured anonymity of the participants and the college with pseudonyms and by not identifying the school directly. There was no deception in the research plan or execution, and the participants were not from a known vulnerable population.

For the interviews, I held a guide of areas of exploration and asked open ended questions to encourage the participants' stories. Any identifying details they shared were removed and replaced by more non-descript text in parenthesis. In order to minimize my impact on their stories, I intentionally remained personable and neutral during the interview. At all times, in preparation for meeting the participants, talking to them, and in analyzing and writing their stories, utmost respect is given to their rights and dignity.

4.6. Research method: Semi-structured interviews

> Researchers who are using interpretivist paradigm and qualitative methods often seek experiences, understandings and perceptions of individuals for their data to uncover reality rather than rely on numbers of statistics (Thanh and Thanh 2015:24).

In order to understand the participants' perspectives and interpretations of their own realities, semi-structured interviews were conducted. Each person has a unique path that led them to the college and will see the process of their education differently. The goal was to talk to people who could help me understand possibilities for transformation within the institution from their experiences. To this end, surveys or highly structured interviews would not best suit. I elected to use semi-structured interviews as they allow space for the participants to tell their stories.

Josselson wrote:

> If you are planning to do a qualitative study that relies on interviews, it is because the kind of data that you wish to obtain focuses on some peoples' experience of some aspect of life, and what you want to learn about it they experience and the meaning that they have made of it (2013:36).

In planning the interview, the primary question is regarding the presence or lack of transformative teaching and learning in the case study college, but this question was not specifically asked in the interviews. Josselson (2013) calls this the "big Q", or conceptual, question. The "little q" questions are used during the interview in order to answer the "big Q" question.

> The "little q" questions marks the launching point of the interview conversation. It is the place to begin the narration. It must orient the interviewee and engage him or her with your research interest but must not color the interview in a direction that doesn't fit the interviewee's experience (Josselson 2013:41).

In each case, I began the interviews by inquiring about the participants path that led them to the college, and however far back in history that story started was up to them. I avoided interrupting them by jotting quick notes when needed if they said something that piqued a follow up question or needed clarification, so I could circle back. In terms of the aims of this study, I viewed the participant as the teacher and myself as the learner. I was quite content to allow them to speak without interfering, without what Josselson describes as 'giving over the expert role [that] is sometimes difficult for researchers who want to be recognized for their knowledge and expertise' (2013:28-29). My job was primarily to listen and understand, prompting them to share.

The interviewees fell into three categories: 1.) the president of the college, 2.) the instructors of skilled trades programs, and 3.) the students of those instructors. The interview guides for each of these are in Appendix H.

The President was interviewed to learn more about how the college is purposed, and how it measures success. I was curious to learn how the mission and vision of the college stood in comparison to general purposes of education discussed in the literature review. The President was also asked about her previous experience that led her to the case study college, aims and any continuous improvement goals, and her experience with public perceptions of PTE.

The instructors were interviewed to discover how and why they came to teach, and if known transformative teaching methods were employed in their classrooms. Interview themes for the faculty included their personal path to becoming an instructor, how long they have taught and whether or not they had previous teaching experience. I inquired about their aims, teaching methods, and their interpretation of their students' behaviour regarding challenges, successes, and possible transformation in their programs.

The intent of interviewing the students was to see if transformation by learning opportunities was occurring, implicitly or explicitly. Themes for interviewing the students included their age and background, how they came to be a student at the case study PTC, and their previous school experience. I asked about challenges, what they enjoyed, and about any changes in their outlooks as a result of the experience. I also inquired about life events leading them to the program and any life events during their time as a student. I asked them to share their thoughts on opportunities they had as a result of the program, whether or not they had a job secured after graduation, and if they felt like they benefited from the program. I asked them about any recollections in terms of experiencing discussion, critical thinking, reflection, and mentoring/working with others.

4.7. Logistics

This section presents how the case study school was chosen, demographic data about the area and students, steps taken in addressing the college and recruiting participants, conducting the interview and finally, how the data was handled.

4.7.1. Contacting the school

A preliminary online search of typical skilled trades work was done prior to contacting any school for research purposes. This was to ensure certain programs were offered at the case study college. I chose to focus on work that does not require formal schooling because these tend to be held in lower regard. This was the basis of the inclusion and exclusion criteria used to establish the population from which the participants were selected (Robinson 2014). Nursing and radiation therapy are trades that require formal schooling to begin work in the

field, with certificate and degree requirements set by a governing body. They typically enjoy more professional respect than a mechanic, for example. Mechanics do not require formal education to start the job, though continuing in the field may require further education. I developed a list of trades to focus on when recruiting participants, and then looked at colleges that offered programs:

- Automotive Collision Repair
- Automotive Mechanic
- Diesel Mechanic
- Electrical / Instrumentation
- Heating, Ventilation, Air Conditioning, and refrigeration (HVAC)
- Machining
- Plumbing
- Welding

Further online investigation of technical schools and colleges that offered some of all of these programs was done. This was the first criteria in my search, the second was the school had to be of a suitable size as to afford anonymity of both the programs and the participants.

4.7.2. Interview pool and participant recruitment

To recruit instructor participants by first defining the study population (Robinson 2014), I obtained the list of all faculty and staff at the college from their web site based on the list of crafts above. Nearly 30 people were identified as instructors of the skilled trades listed above. I put all their names in a bowl and drew twelve at random. I emailed all twelve prospective participants at once and within days received four replies. The emails sent to the faculty to request the interviews is in appendix G. Hoping for more than four instructor interviews, I drew two more names and emailed them as well. Both follow-up requests responded affirmatively. I arranged the interview times and dates initially by email, but with a phone call if confirmation was needed. One of the instructors had to cancel our appointment, leaving a total of five instructor interviews.

To solicit the student participants, I visited the classrooms of four of the five instructions who graciously granted me about ten minutes of their class time. I

offered an introduction of myself and the study including its purpose and my motivation for the project. I included a brief statement of transformative learning as a means of explaining changes in perspective or their way of viewing the world that may occur during the educational process. I also offered that there was no prerequisite; that I was happy to hear anyone's story. This brief presentation included acknowledgement of approval from the college to conduct the research.

Copies of the participant information sheet were available. I passed around a sign-up sheet for anyone interested, expressly noting that providing their name and email was not committing them to anything. Of the four classes, twenty-six students signed up with interest to possibly participate in the study. I began the same process as with the instructors by putting all the names in a bowl to draw them randomly, except I began with six names initially. I emailed the first six students and being very aware of the timing toward the end of the term, only waited 48 hours for a response before drawing two more names until I had a total of six student participants.

For both the instructors and the students, I requested about an hour of their time, on campus, with a possible follow up email or phone call.

4.7.3. Conducting the interviews

The interviews took place over an academic year, between September and June. The instructors were interviewed in the winter during the months of December and January, then the President and students the following May. I interviewed all the instructors prior to the students. The students were interviewed close to the end of their education, to allow the most experience possible at the institution. When soliciting student participants, I specifically asked for people completing that spring.

All twelve interviews took place on campus for the comfort and convenience of the participants. The interviews with the instructors and president were held in or around the instructor's offices. Some of them offered shop and lab tours when personal protective equipment was not required. The student interviews

were all conducted in study rooms or quiet lounge areas scheduled with the help of an administrative assistance in the Director's office.

At the beginning of each interview I provided the participant information sheet and offered a verbal summary during which I explicitly stated their anonymity will be protected by the use of pseudonyms and they are free to end the interview at any time. I appreciated a couple of the participants wishing to be named after famous action figures, but politely told them for the purposes of this research, they would likely be penned something more mundane. All the participants then signed the participant consent form and were offered a copy of both that and the participant information sheet to retain for their records.

After the formalities, each interview began with my request for them to share the event or string of events leading to their current role of instructor, student, or president. From there, I mainly listened, asking questions, and ensuring at some point the main concepts outlined previously in the interview guidelines were touched on in some manner. After getting over some initial nervousness, I really enjoyed the interviews. I found them enlightening, inspiring, and some were quite humorous.

The twelve semi-structured interviews lasted an average of 63 minutes each. When they went longer than an hour I paused and reminded participants of the time. Although very happy to keep talking, I didn't want to compromise their schedule or take too much of their time. In all cases, they said it was fine to extend the interview beyond the hour.

4.7.4. Data handling and storage

All interview data was self-transcribed on my personal laptop. Transcribing them myself, whilst it seemed to take a very long time, was an opportunity to familiarize myself with the data. More about this process is described in the next section. To protect the anonymity of the participants, pseudonyms were assigned during the transcription process. When the participant referred to someone else in the program, whether another participant or not, that person was also assigned a pseudonym as well in the transcribed copy. Only the participant consent form contained the real name of the participant, and these

are not linked in any way to the recordings. Once transcribed, the interviews were printed to begin the analysis. All of the data, in printed or electronic form, remained under two levels of security unless I was actively working with it. The interview recordings were deleted after the physical versions were saved in two locations, one printed and one electronic.

4.8. Analysing the data: Thematic analysis

> Analyzing qualitative data is a formidable task for all qualitative researches, especially those just starting their careers. Novice researchers follow urgings of mentors who emphasize the need to collect rich data that reveal the perspectives and understandings of the research participants. After weeks (or months or years) of data collection techniques, they find themselves sitting in their living rooms surrounded by boxes of data. (Gay, Mills, and Airasian 2009:447).

Indeed, I had over 76,600 words of self-transcribed interviews. After transcription, the next stage was to systematically extract meaningful, authentic results. In order for qualitative data to be meaningful there must be a rigorous and methodical process of analysis. I considered Grounded Theory for its flexibility as an alternate to positivist methods (Waring 2012). However, this was not the best fit for this study for two reasons. First, the flexibility that allows for adaptive analytics in qualitative research could challenge the trustworthiness of the results. The second reason was I had selected the interpretive paradigm, and in Grounded Theory 'the ontological assumptions being made are realist in nature, that is they assume that there is a single objective reality that exists independently of individual's perceptions of it' (Waring 2012:298). Instead I chose to conduct a thematic analysis of the interviews.

The steps of the thematic analysis better ensured quality and fair treatment of my data. Thematic analysis is a method for making sense of qualitative data by identifying and analyzing patterns (Attride-Stirling 2001, Komori n.d., Clarke and Braun 2013). It is a precise, consistent, and systematic approach to obtaining useful information. The thematic analysis method is flexible as it does not 'adhere to any particular theory of language, or explanatory meaning framework' (Clarke and Braun 2017, 2013:120), but the rigorous six-step approach allows for quality and trustworthiness in the results. Thematic Analysis

as developed by Braun and Clarke 'provides a robust, systematic framework for coding qualitative data' (2014:1-2). The thematic analysis results allow the reader to experience the sense of the interview, not as I perceived it, but as the participant exemplified it. Coding the data and grouping into themes requires the breakdown of the commentary and clarifies the text line by line. As the analytic instrument, I work with what the interviewees said, identifying 'patterns in the data that are important or interesting, and use these themes to address the research' (Maguire and Delahunt 2017:3353).

In teaching thematic analysis, Clarke and Braun ask their students to:

> Spend a few minutes reflecting and making notes on two things prior to beginning analysis: (1) the assumptions, if any, they hold about the research topic; (2) their values and life experiences, and how this all might shape how they read and interpret the data (2013:122).

During the introduction I shared some of my life experiences with my father who worked in the trades, and my feelings when I witnessed disrespectful treatment of electricians while working as an apprentice. I remain aware that my perspectives and interpretations should not be left unchecked during the research process. The research questions were developed to reduce risk of my own interpretations shaping the study, as was the thematic analysis process. I am not looking to discern whether or not people who attend professional technical colleges and work as skilled crafts people are intelligent or not, I imagine there is a spectrum of this in the trades as there likely is in any other field. I am exploring whether there is evidence in the case study institution of recognized teaching practices that promote transformation, and evidence of transformation from the perspectives of the students. In this way, and via a systematic approach to gathering and analyzing the data, I tried to reduce my own influence on the research process.

I followed Braun and Clarke's 2006 six-phased approach to thematic analysis. It's important to note that although the phases are numbered, it is not always a linear process. The phases of thematic analysis are:

1. Familiarizing yourself with the data – Transcribing data (if necessary), reading and re-reading that data, noting down initial ideas.
2. Generating initial codes – Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code.
3. Searching for themes – Collating codes into potential themes, gathering all data relevant to each potential theme.
4. Reviewing themes – Checking if the themes work in relation to the coded extracts and the entire data set, generating a thematic map of the analysis.
5. Defining and naming themes – Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells, generating clear definitions and names for each theme.
6. Producing the report – The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis. (Braun and Clarke 2006:87).

4.8.1. Familiarizing yourself with the data

I elected to transcribe the interviews myself for two reasons: it is an additional opportunity to review the data, and I wished to hear the participants voices again. Both reasons are a means for becoming more familiar with the data. At this initial step, I made a few notes in the margins of the printed copies, but primarily read the transcripts with interest. I tried to not think about the research questions, and instead listened to the participants voices as I reviewed each passage, considering what they were saying regardless of the aims of my study.

4.8.2. Generating initial codes

The data was coded first by highlighting interesting passages, and statements that seemed to repeat amongst the participants. A related word or two was written in the margins. As subsequent interviews were coded, I found myself returning to previous interviews to add codes, and as a result each interview was read several more times. Examples of some of the codes are: life event, cohort, learning styles, critical thinking, job goals, and hardships. At this stage in the process, there were well over 100 codes and it became worthwhile to reduce some of the data. Not all of the participants statements were coded. This

strategy is beneficial especially in paring the data down to manageable amounts (Attride-Stirling 2001). I entered the codes and associated passages into a spread sheet, so I could sort and re-order them. The lines of data on the spreadsheet also included the participants pseudonym and whether or not they were an instructor or student.

4.8.3. Searching for themes

Once all the data was in the spread sheet, I began grouping codes into what became sub-themes, and added a column accordingly. The sub-themes were then grouped and analyzed again to identify themes, with the relevant data attached. This phase, according to Braun and Clarke, is ‘essentially, starting to analyze codes and consider how different codes may combine to form an overarching theme’ (2006:89).

Subthemes were identified prior to the main themes, by grouping the coded data. These are essentially summaries of parts of the data that Salma Patel (2018) refers to as domain summaries. A theme, on the other hand, ‘identifies an area of data and tells the reader something about it’ (Patel 2018:np).

An excerpt from the data spreadsheet is presented in table 4.2.

Table 4.2: Sample data spreadsheet with codes and themes.

Theme	Sub-Theme	Code	Person	Type	Evidence
Relationships in Education	Teaching Approaches	Mentoring	Travis	Instructor	I've talked to other faculty members who believe their job is to only teach them the skills set of the program – they say I can't influence a person's attitude, or their perspective on life. But I think we can and I think we have an obligation to do that. We're their role models, and also maintain standards of decorum, and professional ethics, and attentiveness.
Relationships in Education	Mentoring	Peers/ cohort	Jack	Instructor	there is some peer tutoring going on, informally. I see it. I definitely encourage it. But I also encourage them to … you know there is this thing called social loafing. And we have to be aware if somebody is just copying all the work.
Relationships in Education	Caring/ Coaching	Mentoring	Jack	Instructor	I've been right there beside them, to say hey that's great but how about this, or often I'll just use my camera and do a little recording or a picture then I can show them this is what you are doing, and if you do this maybe this will work out for you better. So its that style – the one on one style – and there is 16 out there during the week. So 16 or more times a day you are checking everybody and see where they're at. You can't do that in a lecture hall.
Relationships in Education	Caring	Cohort	Dr. P	President	So the cohort model lends itself to people knowing each other better. This was at another college which wasn't cohort based, but it almost was – and when a student missed a class period, the teacher would call the student, or email the student and say we missed you in class today, where were you? She had the highest completion rate of any program in the college because she demonstrated that she cared about the students That's easier to do in a cohort model. It happens naturally.
Relationships in Education	Caring	Trust / Cohort	Travis	Instructor	And the cool thing about our cohort model is it gives us the time to do that, for that to take place. When I see the students, I see them for a full year, with the same group. So they get a chance to know me quite well. That's a unique advantage we have in the way the school is set up and it's hugely advantageous in that establishment of trust.

4.8.4. Reviewing themes

In this phase I was still re-working the themes and comparing them to the entire data set. I dropped or merged themes that did not have sufficient supporting data on their own. I collapsed everything on the spreadsheet except the columns for Theme and Evidence, and made sure the evidence directly supported the theme. I also sorted the evidence by one theme at a time to make sure it all made sense together, regardless of the individual and the code. Once satisfied with the themes, I then began mapping them with sub-themes, in relation to each other. This mapping did two things, it helped further define the themes, and it revealed a process relevant to professional technical education and transformation.

4.8.5. Defining and naming themes

In phase five, the scope and content of each theme was defined (Braun and Clarke 2006). The map displaying the relationship between the themes was instrumental in this process.

As well as identifying the meaning of each theme, it is important to consider how it fits into the broader overall story being told, in relation to the research questions, to ensure there is not too much overlap between themes (Braun and Clarke 2006:93). The analysis of each theme must be understood prior to the final phase. Maguire and Delahunt (2017:33511) suggest the following questions to ask at this step of the analysis:

- What is the theme saying?
- If there are subthemes, how do they interact and relate to the main themes?
- How do the themes relate to each other?

4.8.6. Producing the report

Once the previous phases were well in hand, the report can be written, or in this case, the findings. The findings are the culmination of the analysis communicated with supporting evidence from the interviews, in terms of the research questions.

4.9. Conclusion

In this chapter I presented and justified the interpretive paradigm for this research, described the logistical steps taken to conduct the interviews, and discussed how quality and trustworthiness are ensured by the paradigm and thematic analysis of the data gathering method. The findings are presented in the next two chapters. Chapter five presents portraits of the participants and chapter six is a detailed analysis of each theme derived from the data analysis.

Chapter 5. Participant portraits

5.1. Introduction

> If I had Dave's knowledge, man, I would love to teach because I see what kind of different he makes. I see the impact he makes on people's lives and it's a lot more than just how to turn a wrench. It's a lot more than that (Mitch, a student, regarding his instructor).

The above statement of personal and professional transformation evidences the difference that a skilled and caring teacher can make to their students. This chapter presents the participants through their own voices, throughout which I will highlight key points regarding transformation. These portraits add richness and depth to the themes which follow in chapter six. In sharing the character and voices of the participants, I made the decision to include some lengthy quotes. This is by design in order to provide a strong sense of who they are, and to communicate key aspects of their experiences in their own words. I will comment throughout regarding specific points of interest and highlight significant findings at the end of the chapter. I begin with setting the stage by describing the case study professional technical college, then a brief portrait of each participant is presented.

5.2. The Professional Technical College (PTC)

5.2.1. Demographics and statistics

The case study college is in the Pacific Northwest region of the North America. It is accredited by the Northwest Commission on Colleges and Universities (NWCCU), recognized by the Council for Higher Education Accreditation, and the United States Department of Education. The NWCCU membership includes colleges and universities in Alaska, British Columbia, Idaho, Montana, Nevada, Oregon, Utah, and Washington.

The PTC is aimed at developing a skilled and competitive workforce through student-centered and value driven education. The majority of programs at this college are terminal degrees or certificates, though some transfer options are available. There are about 3000 students enrolled quarterly, and the average age is 32. Thirteen percent of the students are younger than 20 years old, and some of those are still enrolled in secondary education earning dual credit. Half

of the students receive need-based financial aid, and just under a quarter are first generation college students. Seven percent of these professional technical students already have a bachelor's degree. Regarding the college's completion rate, the president commented, 'We have an 84 percent completion rate, but we could be better.'

Many students find the college by word of mouth. Travis, an instructor, indicated there are marketing efforts on social media, flyers, and banners on city busses, but about 70% of the students go to the college because 'someone's uncle, someone's brother, sister, was in the program and they heard great things about it'.

> I'd say maybe 30% right out of high school, and the rest are well out of high school, either in their mid-20s or older. A lot of the older students are coming from another career. Maybe they got laid off, maybe they are just tired of that career they want something different and they heard about this program. There seems to be a wide demographic (Travis).

The majority of funding, 49%, comes from the State and is spent on Instruction. 31% comes from tuition and fees, and grants provide about 13% of revenue. Funding from the state is a continuous topic of conversation due to the hi-tech nature and large space requirements inherent in PTE. Dave, an instructor, commented,

> We are high cost, high demand. High cost because we are not like a university with 180 students in a class with one instructor. We start with 24 students and about 90% finish the program.

The lab and shop space across campus is great. The Automotive Department alone houses over fifty vehicles for hands-on practice. This results in the higher cost per student for the college to run the programs.

Currently the college is its own entity and that is how everyone I spoke with there would like it to remain. A potential merger with the local community college for budgetary reasons was discussed for years. Dave, who had been at the college more than twenty years commented:

> The last president said, I love these programs, but I don't see how this is financially viable. I don't see how you guys are going to stay afloat unless you merge with (local community colleges).

While costs could be recuperated by consolidating similar positions between the colleges, attempting to mingle the mission and vision of each institution becomes problematic. In her interview, the President shared some thoughts on the merger conversations over the past decade:

> The missions are so different. In a comprehensive community college, a technical education is a second-hand citizen in most cases, and their focus is on transfer. So, you have an institution that is focused on transfer, and an institution that is focused on career placement. Different missions, different visions.

The culminating thought on combining the administrations of the professional technical and community colleges was 'just don't do it' (Dr. Phillips, college president). The PTC is focused primarily on terminal degree and certificate programs aimed at a job path following graduation.

The college offers more than 70 degree and certificate options. For the purposes of this study, I intentionally selected participants from fields that do not require a formal degree prior to entry or hire. These programs enjoy an over 80% employment rate upon program completion. A student, Derek, shared that of all the people completing his program together, only one had not yet secured a full-time job, and graduation was still a month away.

The following table shows the current average residential costs and in-state earnings in US dollars for the participant programs: automotive technology, collision repair, diesel technology, electrical, HVAC, instrumentation, machining and welding. This data is from the case study tuition and fees site, the State Employment and Wage Data Source, and the State Employment Security Department. It reflects 2014-2017 employment.

Table 5.1: Average costs, employment rates, and in-state earnings (US DoL nd).

Two-Year Programs		Employment Rate post-Graduation	In-State Annual Wages		
Est Resident Tuition & Fees	Est Cost per Year		25th percentile	50th percentile	75th percentile
$ 15,133	$ 7,566	82%	$ 42,200	$ 57,400	$ 71,400

5.2.2. Typical program structure

Students are typically on campus from 8:00 am until 3:00 pm, Monday through Friday, though the shops and labs remain open much later and many students take advantage of that time. Completion requires three general education requirements in english, math and humanities. In addition to these three classes, each program has a set sequence of classes. Students begin in cohorts of about 24 and remain with this same group for the full two years. There are fixed entry and exit points, and one cannot take a quarter break then resume where they left off; they would have to wait a full year then join in with the next cohort.

It depends on the course and point in the program, but each of the programs visited practiced a common daily format. Part of the day is spent in the classroom on theory-based discussion, knowledge checks, presentation, and lecture. The rest of the day is spent in the lab. Lab or shop time is made up of both instructor-led and student-directed activities. There are demonstrations by the instructor, as well as informal time to work on projects independently or groups. With respect to class and lab time, Dave, an instructor, stated:

> Some days they may be in the classroom for two hours. And when I say in the class I don't mean dry lecture, but often doing things together as one group. And when I say in the lab I mean actually (working the trade). So, in the first year where we have them 8:00a-3:00p, the morning is closer together. Maybe were doing a demo, maybe we're working on trainers and then the afternoon it's more open lab time where we have actual orders we are working on. That's the normal mix.

The instructors all have course goals and outcomes, but often the learning is in response to an opportunity or need. John, an instructor, utilizes instructional technology and shared how he will modify the day's plan when he recognizes concepts are being misunderstood:

> I deliver a lecture now and then. We have an online text for learning that gets them started. They'll be working on that then I will introduce topics and make it real-world. When I see problems while I'm grading, I try to bring those in, sometimes one on one. When I'm going to give a lecture, I'll schedule them in (the campus calendar) so everyone knows this is when I need to be there for this particular subject. I don't just do it because it's time to lecture, it's as they are needed.

When asked about how the learning day is spent between the classroom and the shop, the most tenured of the instructor participants, Jack, chuckled and said:

> Well that's a discussion that is ongoing with my Dean. She would like to see it very structured, and that is not going to happen. I have outcomes of course, but I prefer to keep it flexible. If a student brings in a broken piece, we're going to analyze that right then because it's fresh. So, my plan for the day is often turned upside down. Now the objective for the class hasn't changed a bit. We are still going to get there. I can see the end of the quarter and I build day by day towards that end, but exactly how we get there is sometimes messy. Learning is messy, and it should be. I think it sticks better if it's messy.

Jack's comment regarding messy learning resonates with developing critical thinking skills. In 'How messy learning helps us develop critical thinking', Watanabe-Crockett wrote:

> Though the teacher provides specific guidelines and goals, students must engage their higher-order thinking processes to solve those problems. Messy learning is "non-linear" learning while "clean learning" is like "linear" thinking. Messy learning can be compared to a jumbled-up tangled string which meets itself several times at different angles. When you are forced to look at something at different angles, your perception is strengthened. Each angle reinforces your understanding of it (2016:np).

Overall, Jack, like the other instructors, shows a strong responsiveness to student learning needs, as demonstrated by their flexible approaches to teaching. The instructors check for understanding and follow up on gaps. They recognize and take advantage of learning opportunities in real time. Teaching is a process, as described by Beck and Kosnik:

> Many unexpected things happen when we are teaching, often upsetting our best laid plans. To a considerable extent we have to go with the emerging flow of the class, making modest adjustments rather than major shifts dictated by external considerations. We have to work with the students' understandings, recognizing that they must largely create their own knowledge; modifications that take place must be in their structure (2001:219).

5.2.3. Advisory Committees

Each program reports to an industry advisory committee that has significant influence on the curriculum. There are over 300 business and industry

representatives serving on the college's program advisory committees, and they typically meet with the program instructors twice each year to ensure the program is producing individuals that can meet workplace needs. Of the meetings, instructor Dave said:

> Our Dean is always at the Advisory meetings, and if they say you guys are spending all this time talking about (this) which is great, but what we really need is a skill set in (that) or whatever they say – that holds a lot of weight and we will be held accountable to that.

The goal of the college to build a competitive workforce means that the students need to be capable of executing work in the current trade as well as continue learning and performing in pace with technological advances. Many of the trades are changing rapidly, and effectively prohibit a set year-to-year curriculum in several of the programs if students are to continue in the field. It is the school and the instructor's ability to adapt to these changes, while still providing a basic foundation, that makes them successful. The students are developing both tacit skills immediately applicable in the work place, in addition to the ability to think and evolve in response to future changes. Derek, a Machining student, appreciated the value of the Industry focused, flexible curriculum:

> A couple years ago a company said we have to be able to (complete a certain task) in under 5 minutes. So, the instructors have laid that on us and I thought, I don't know if I can do it or not. But now I can do it in under 2 minutes. It was one of those things the instructors taught us because it's a skill we'll use later. There are people out in the industry who can't (complete the task) in under 5 minutes, but now I can do it and still have time for a cup of coffee. I think that technical aspect is better than some university degrees because we are more prepared to actually go to work.

Practical skills that serve the current needs of the industry are a focus in PTE, but they are not the only focus. The first goal of the college is to facilitate career success in its students. The findings indicate that the instructors recognize the technical fields are continuously advancing as several of the instructors described the importance of teaching critical thinking and problem-solving skills. The mission of the school is to educate graduate self-directed learners who can meet current workforce needs and grow with technological

advancements in their field. I now will introduce the study participants striving to meet this goal.

5.3. The Participants

Interviews were conducted with twelve members of a Professional Technical College: five instructors, six students, and the President. The full interview themes are in Appendix H. Tables 5.2 and 5.3 provide some high-level information on the participants, before introducing them in more detail.

Table 5.2: The Instructors and President.

Name	M/F	Age	Prior teaching experience?	Years at the PTC
Dave	M	40-50	Taught specialty trade night classes at a community college while working full time as a technician.	20
John	M	30-40	No.	3
Travis	M	30-40	Tutored one day per week at the high school for a few years.	18
Jack	M	50-60	No.	23
Simon	M	50-60	No.	14
Dr. Phillips	F	40-50	Yes	2

Table 5.3: The Students:

Name	M/F	Age	High School Experience	Reason attending the PTC
Jason	M	30-40	Fair.	Retraining injured at last job.
Rick	M	40-50	Fair.	Retraining, disability
Wes	M	50-60	Fair.	Retraining, disability
Derek	M	30-40	Poor. Expelled	Retraining, disability
Mark	M	20-30	Fair, ‘easy’	Didn’t like University, wants technical skills.
Mitch	M	20-30	Poor. Arrested in class, sent to juvenile detention.	Retraining, disability

5.3.1. Dave - Instructor

Dave welcomed me into his office and began searching for syllabi and course outlines to provide. After twenty years teaching, he was still excited about his trade and being able to share it with others. I revisited Dave's classroom months after our interview to recruit student participants and while Dave was introducing me to them, he suggested the students might take advantage of opportunities to make a difference for future students by sharing their stories and making their voices heard. He teaches a highly technical trade that requires strong problem-solving and critical thinking skills, and he loves witnessing moments when his students suddenly grasp a concept they've been struggling to understand.

When Dave was in his 20s he thought he was going to be a skilled tradesman forever, he'd never considered teaching. Born and raised in another state he began working as a craftsman where they were leading the industry on environmental regulations. Married, and having at that time about ten years of experience, he relocated to another state. While working full-time in a new location word got out that he had certifications regarding certain environmental standards. He was asked if he'd like to help other tradesmen learn these skills as environmental initiatives spread. So, he worked full-time as a technician during the day and taught night classes at a community college. He stated it's not uncommon for instructors in trade school and at the case study college to begin their positions without any teaching experience: 'You'll have someone who has been installing furnaces and commercial units for 25 years and then suddenly they are handed a classroom with 25 students starting at them.'

He applied for the instructing job here at the college, which was at that time a technical institute, and 'it just kind of happened'. This was twenty years ago. Regarding his employment acceptance, he said:

> I interviewed, got hired, then the quintessential 'there's your building, here's your keys, good luck with that.' I was literally standing outside the door here with the dean at the time asking if we had textbooks. And this is dating myself, but I also asked if we had slides, overheads, what? He said it's all in there, bye. Just handed me the key and walked away.

His experience teaching night school helped, and so did his new peers. He was able to work closely with two other related program instructors; one who was fairly new, and one who had been there a long time. At that time, Dave was also managing much of the administrative duties as the departments are small and typically made up of one person. He took four required education and curriculum development courses to get his vocational education certification.

> I'm not going to be able to remember (the names) now, but they are essentially on understanding learning. That was a big part. Things like learning styles. Things we'd never thought of before, you know, that as the lightbulbs go on, not all students learn in the same way.

Comparing his experience as a new instructor back then to those entering a professional technical teaching career now:

> We just had an instructor transition out after 33 years, so we are getting someone new right out of industry who is a graduate of the program. And, um, he is in syllabus hell, that's basically where he is right now. Watching his process compared to my process, twenty years later there is a big difference as far as the mentoring. But on the flip side there is a lot more paperwork, a lot more committee and faculty responsibilities, and a lot more hoops to jump through.

Dave's powerful comment regarding 'syllabus hell' and the relaying his own experience transitioning from industry to teaching allude to a window of discomfort ripe for transformation. There may be a gap, or a lack of support from the institution, but what happens in that space is the teachers, at least the ones that are successful, figure out the skills that are needed. This is evidence of a transformative process.

Dave recognizes a change in the students over his twenty-year tenure. When he began his teaching career most of his students had practiced some form of the trade at home, typically working in the garage with their dad.

> Now we're getting more people who have been raised in apartments. They don't know what a screwdriver is. They call somebody if the dishwasher doesn't work.

Often teaching the youngest cohorts on campus, he has witnessed a change in those coming straight to the program from high school, especially in their ability to think critically. They are 'more than ever not prepared for life'. Dave

therefore employs a variety of teaching methods in class and uses daily knowledge checks to make sure his students are keeping up with the content, but one of the primary endeavors is teaching students how to think critically, and it is sometimes an arduous process:

> I often hear (the students) say, 'wow I've never had to think this hard'. I always hear them say my brain hurts, I can't think any more about this, my brain is coming out of my head. They say, 'can I google this' and there's no googling of that. So, a lot what we end up doing especially today is just developing thought processes. Even if it's one specific job that they will never see again, just think. Think about it. Think about how things work. How can you apply your knowledge? What's a solution to it? I don't know if it's the standardized testing in high schools or what, but I've seen a definite decline in incoming students' ability to think. There's a huge difference now then there was twenty years ago.

Dave has several critical thinking tactics to guide students through the process of developing these cognitive skills. He recognizes signs of struggle and is able to relate more complex work processes back to something he knows they understand.

Dave cares about his students and is excited for them to learn the trade, all the while respecting that they are adults and the issues that come with being adult learners. He commented:

> We always have stuff going on because they are adult learners. I had a young man in my program who had a baby, so he'd lost some focus. But those are factors. They are adult learners and life is in the way. Money, financial situations and all of the other stressors. So, we try to consider all of that.

His combination for expertise, teaching skill, and compassion has earned the respect and praise of his students. One student participant in his programs claims Dave is a major factor in changing his life for the better. Mitch said, 'I had a kid on the way, I've had two surgeries, and my instructor made it work somehow.' This is significant as it demonstrates how Dave cares for his students' success, and how being flexible again facilitates that success.

5.3.2. John - Instructor

John described himself as one of the 'smart kids' when he was in high school. He did well in school without much effort and admits that this 'wasn't the best

thing, not having to try.' His easy-going demeanor almost comes across as dispassionate, but under this outward presentation is someone who is inspired by a challenge.

After high school, John went directly to a four-year college. Sounding a bit bored with the thought, he said:

> So, I graduated from high school and was like, well, I guess I'll go for an engineering degree at the (state university). So that's what I did, and I absolutely despised it. I didn't have much drive.

He forced himself to do the work for a while but without any interest in what he was learning, he left the university after two and a half years. On his own, 'poor and a little depressed maybe', he went to a local community college engineering technician schooling which he said was 'a little better'.

He worked for a short time then traveled with friends towards the west coast with no idea what he was going to do when he got here. He found work at a technical company and noticed a machine sitting idle most of the time because nobody knew how to run it. He approached the boss, was able to secure informal training and performed a job with that machine for four years. From there he moved on to another technical company where he worked with a programmer who John says was 'interesting': 'He knew what he was doing, he was just lazy, so you really had to be on your toes and catch things before they ruined the machines.' This inspired John to want to learn programming, so he came to the program at the case study college of which he is now the instructor. At that time, they were in between instructors and he admitted it was kind of a 'free for all,' but this was fine with him since he already knew much of the work and was focused on programming.

He went through two more jobs in about three years before the company he was working for was sold to new owners. He 'wasn't a big fan of some of the changes they were making there, so he thought he'd have to get a new job.' The teaching position was open at the college. John had never considered being a teacher, but his wife encouraged him to apply. 'So, I was like, 'ok', and that was three years ago. This is my third year here."

John is laid-back, but not apathetic. He is certainly principled as demonstrated by his desire to leave a job due to changes in management. Throughout his

journey between high school and becoming an instructor he was motivated by not just a challenge, but the opportunity for fulfillment. He takes the initiative to learn and does not settle where he is not satisfied. He recognizes the value of being inspired at least in the polarity of being unfulfilled in high school and at the university.

John and a peer were hired as instructors at the same time. Neither had any teaching experience. We 'inherited a program that pretty much had nothing.' Similar to Dave's experience, they were told by the administration essentially to 'build it from scratch. So here you go, good luck.' Regarding starting his role as a new teacher, John recollected:

> When we got here maybe half the machines didn't work. So, we had a class of 48 students coming in the fall, we'd never taught before, and our lab didn't work. Our summer contract was supposed to be for writing curriculum, but we pretty much spent that time getting the equipment to work because we needed a lab. The first day of school we had no curriculum to teach but (with a shrug of his shoulders) we were like, 'oh well', at least the machines run now, and our shop is somewhat clean.

After three years as an instructor John feels it is about three-quarters of the way to a complete curriculum. The program was commended by a student, Derek, who entered at the beginning of John's second year teaching. He said the instructors work very hard: 'They have 24 students – 24 people who have no idea what they are doing, you know? So, they are running around like crazy.' Derek chuckled and made the point that when he started the program, the instructor had hair: 'He doesn't have hair anymore – (holding up two fingers) - two years.' Another student, Mark, returned to the program after having been in it a while under the previous instructors. He stated:

> These guys have done a ton of work, so I give them kudos for that. They've done a lot of work and I can see the difference they make. The program is a lot better now.

Derek commented on the rigor of the program. The first year is challenging and there is a lot of math. John has structured the first year of the program to scaffold the second, and teaches the foundations needed that are often challenging to the students. He said:

> You can see when someone is closing off their willingness to learn, you can see that pretty quickly. But knowing how to get through, or having the time… It is a short program, you just have to dive in and get to it.

He is confident in his ability to teach one-on-one, and comfortable lecturing to the group. He recognizes that some students come to the program 'are not really comfortable in school' and utilizes the assistance of an Integrated Basic Education Skills and Training (I-BEST) instructor with the first-year students, who is trained in education. John, like many of his students, doesn't think of himself an academic. He refers to the I-BEST instructor as the 'professional teacher'. Yet he has collaborated with his peers to develop the curriculum for a challenging two-year technical program, and continues to still strive, challenging himself, to make it better.

5.3.3. Jack - Instructor

Jack told of learning how to weld when he was just five years old: 'I grew up in the shop.' Prior to World War II Jack's dad was a logger in the local county. During the war he was an aviation technician and passed on the mechanical inclination to his son. Jack smiled while sharing that his friends still joke about sculptures he made welding 'junk' together growing up.

For about twenty years after high school Jack worked in various construction jobs, the bulk of that time in another state. When he moved back to the local community in his mid-thirties, he served on one of the advisory boards for the case study college, which was at that time called a technical institute.

> All of our programs are driven by advisory committees, so we keep current. Once each year we do a program review and we meet twice per year to just keep up with what is going on.

Jack was on an industry advisory committee to the college when the position he holds now in opened for applicants. He was selected as part of the hiring committee and shared the job description with his wife: 'She kept reading it, then looking at me, then reading, and looking at me,' he said with a laugh. She asked why he wasn't applying, so he did, and has been in the role for over twenty years. Similar to the first two instructors introduced so far, and without any formal teaching experience, Jack was given keys and told 'let me know if

you have any trouble'. In addition to a mess of unfinished projects to clean up, he had to learn how to teach:

> There was a lot of scrap – WW2 vintage stuff that really didn't have a place in modern education. No pedagogical value, no andragogical value. We're adult educators so probably the biggest problem was not the iron and piles of stuff. The biggest challenge is how do people learn and how do you facilitate that learning.

The first summer he was hired, Jack took a master's level class in adult education at the local university claiming, 'it was fabulous':

> It really set a base for building classroom community and how you handle learners, like being learner-centered versus teacher-centered. That was pretty huge, that change. Then over the course of the next seven or eight years I developed a practice. And of course, that continues to develop as generations change. Our learners are not the same learners we had twenty years ago, Sure, they are generally young people who are open to learning, but their methods of learning are a bit different. And being able to move with the generations is something that keeps us on our toes.

What comes across strongly here is Jack's motivation to learn about teaching and andragogy to improve his own practice and ability to effectively reach his learners. This is an example of how the instructors in this study clearly want to be good at what they do. This is demonstrated in how they handled the transition from industry to learning how to teach, and then in their continuous improvement in keeping up with what their students need in order to prepared for a career.

Another constant change in many skilled trade fields are the technological developments, so in addition to delivering a current curriculum fit to the industry needs, and keeping pace with an evolving student body, Jack teaches his students to be prepared for the future of the field:

> I'm trying to show the students that the job today is going to be much different than the job five years from now and ten years from now. And if you build this platform of being able to learn how to learn and be able to think and troubleshoot and apply principles of failure analysis in your personal learning, that you will be invaluable. Whereas if you don't do those things, not so much. You have to continue to move along.

In his teaching, Jack embraces the value in knowing how to read and write well and providing hands-on learning opportunities. He enjoys teaching as much as he enjoys the trade, having employed learning from Brookfield, Palmer and Nicholson, to name a few. Jack is reflective of his own practice and creates opportunities for his students to practice reflection as well.

Jack requires his students to journal weekly by maintaining a blog of what they have learned. Journaling is a means for enhancing professional practice (Boud 2001), and a means for the student to look back to see the course of their learning. Caverly et al. wrote, 'Blogs allow for dialoguing with others about ideas, reflecting on one's experiences, and developing a sense of community' (2008:34). Not only is this an avenue for reflection, but in a career minded learning environment, it can become evidence of learning for prospective employers. One of Jack's previous students recently thanked him for the blogs because they helped him get a job. The student was able to demonstrate his practice as a technician in the writings and videos of his work throughout the program. Jack uses the blogs as a means to 'promote creativity within the student, then to curate their work.'

Active in a broader community of education Jack enjoys discussions with instructors and professors of all levels on the value of a flexible curriculum and 'messy learning'. Resisting the efficiency of just completing a task to check off a box and move on, he wants a 'deeper learning and understanding because that task is going to scaffold the next tasks.' Jack works to create a community in which students want to be a part. During their internships he checks on them at the workplace to ensure the work they are doing, and the work environment is safe. He approaches learning holistically, addressing the student, their academics, and their career preparation. He facilitates the students' sense of belonging with a good nature, humor, and occasional barbeque. He works with them on their academic development in writing, texts and manuals. In the shop they cover hands-on techniques and spend a great deal of time on tools.

Although Jack is modest, it is apparent that the program successfully obtains students largely by word of mouth:

> It seems the word is out there – and I'm not trying to sell myself – but it seems the word is out there that we have a little different method than the typical textbook class – where you read the

> chapter and answer the questions at the end. Now, we have textbooks. We have books all over and we use them. But I typically teach from manufacturer service manuals and their websites so that when (the students) go to the employer they have the skills to use the employer's tools. I want to see that they can read the information, absorb the information, and put it in practice.

5.3.4. Simon – Instructor

Beaming with pride, Simon could not show me enough of his students' accomplishments: 'I want to show you some excitement here – look at this' he said while pulling gadgets off shelves and out of drawers in his office. Seated at his office computer, he shared video after video of student projects, each time telling me the theory they were demonstrating. In the videos, the students were smiling, confident and pleased with their achievements, sometimes laughing and competing with one another. The range of projects was impressive.

Simon, like his colleagues at the PTC, also came from industry, but unlike the other instructors in this study, he holds a university master's degree in engineering. After he became an instructor he earned another master's in education while teaching. Born overseas, he came to the United States where he got his high school diploma before working as a technician and going to night school to complete an engineering degree. He worked in the industry for 28 years before retiring and calls teaching his 'retirement job.' He has been teaching at the case study college for 14 years.

Simon and his one fellow instructor, Mike, have developed a program with options to leave with a certificate after one year or an associate degree after two. There is a transfer option as well. The students come to the program for six hours per day, five days a week. They are in the lab for the first three hours, then in the classroom for theory in the afternoon. It is a combination of kinesthetic and cognitive practice. There are a variety of lab projects and the results are grand, from building motors to designing new patent-pending devices. His expertise and energy are appreciated by his students. One student participant, Jason, commented:

> I came here to look at what this school had to offer and was actually blown away. When looking online I didn't really see what I saw once I got here. But when I met Simon and saw the program I thought, 'this is what I want to do.'

Simon's respect and pride in his students is a key motivator in his teaching. Throughout our visit he continued to show reports, projects, and videos of his students work. He would happily answer my questions then open up another impressive portfolio. His enthusiasm is contagious, his expertise in his trade and teaching lend to a high completion rate of about 90%.

The curriculum is challenging, and Simon facilitates the students' work through a variety of problem-solving situations in technology, mathematics, and engineering where they must be mindful of the industry needs and environmental concerns, and not least of all, employing their imaginations. All of this and more is engaged in just two years of education. Simon admitted the program is very challenging while sharing one of the high-tech projects built by three of his students in just three weeks. But this is key in the reward. Simon leads a program rich in hands-on production. Leading me down the hall to another lab he chatted excitedly:

> This is the first-year lab – a lot of hands-on. They analyze everything and do the work here. (We are) bringing the latest technology here – nothing is obsolete – always keep the student ahead of the curve. We are very competitive and popular, and the President has told us we are one of the top colleges in the country for the retention rate and because people can get a job.

5.3.5. Travis - Instructor

Being good at science and math, Travis had the assumption in high school that he would go to a university. It was almost a given that he would be an engineer or earn a Phd - except he grew up on a farm enjoying work with his dad. His father was a highly skilled millwright who spent time with Travis in their shop, which gave him an appreciation for working with his hands.

> I thought I'd really love to find a career where I could be hands-on as well as use my mind. I didn't see the two as a dichotomy. It seemed to be a continuum with a lot of different applications.

His high school counselors advocated the university track and 'to choose anything other than a four-year degree path was less than – not as good – and they made this very clear to me', Travis said. He took offense to this due to his high regard for his dad and pushed back. His high school counselor eventually directed him towards a technical field at a private school in the state that had a

waiting list. Travis was in the tenth grade when he got on the waiting list so was able to begin attending the summer after he graduated.

Travis noted one of the ways in which his experience at the technical school was transformative was, as the youngest in attendance, for the first time in his life he was peers with people who were older than himself.

> You see, I hated high school. Absolutely loathed it. Not for the classes…I actually enjoyed a lot of the classes I took. But for the social environment. I was just not into the social scene; drugs, parties, extracurricular sports and activities. And so high school was one more drudgery I had to put up with in life. Getting picked on by bullies, all of that. And it occurred to me later on, there was a different degree of maturity there at (the technical school). They were going out to music concerts, museums, oh, there's an art walk in town… There were all these other aspects in life that I was insulated from as a kid in a small town. And I thought wow this is kind of cool. A whole different group of friends.

Due to his experience from working with his dad, Travis was able to secure a part time job at a shop while going to school. Not only did this empower him to pay for his tuition and provide some food and entertainment money, he found himself again, at only seventeen, in a peer situation with people much older than he was. Travis reflected on this time in his life in consideration of traditional American youth environments through high school:

> I met lots of people who I considered mentors, and learned life skills, and interfaced with a whole other set of adults. Reflecting on this later, one thing I'd have to say about the social dimension of high school… I think it has the potential for an almost corrosive effect on young adults, to grow up with people primarily their own age. For most high school kids, the only adults in their life are authority figures. They are not peers. My boss was an authority figure of course, but my co-workers were older than me and they were my peers. My classmates were older than me and they were my peers, and I got to associate with them on a level I had never really interacted on before with other people.

Whether by luck or his personal character, Travis enjoyed great mentoring relationships as a young technician. After completing school, he moved back to his home county and worked at two local companies over the next nine years. Moving home was not the intention. In fact, he always thought he'd move further away, but there was a good job opportunity near home, so he found himself back where he grew up:

> It was a small shop, and despite our varied differences, we all got along. I've never worked in a cadre of people that closely associated as I did at (that shop). We had a full spectrum of religious beliefs and political opinions, and we had the most amazing lunch time discussions. We could argue it out, and then the next hour be working on something together with no malice, there was no harm. It was amazing and a transformative part of my life. I think I was 21 at the time so I was still growing into a man, and it was really good to have that experience at that point.

After six and a half years at the smaller shop, Travis found himself getting tired of the job as it no longer provided any technical challenge. Considering other options, he saw an advertisement in the local paper for an instructor at the professional technical college. He always felt a draw towards education and had even volunteered as an assistant one day a week at his high school in physics and shop class. He applied and upon getting the position, he shared:

> I had to give my employer notice, so I actually showed up here two weeks into the quarter and my students hadn't really learned anything. The other person was just kind of babysitting them for the first two weeks. There was no written down curriculum, the text book we were using was no longer being published. It was a nightmare. Baptism by fire. I survived my first year somehow and thought that wasn't too bad. So, I came back for another year, and have now been here since - over eighteen years.

To support the curriculum he was developing, Travis, knowing his trade well from theory to practice, wrote a manual for teaching his program. It includes the following advice to fellow teachers who might use his work as a resource:

- Do not waste class time transmitting facts to students.
- Use class time to develop high-level thinking skills (e.g. problem-solving, diagnostic techniques, metacognition).
- Use Socratic dialogue to challenge each and every student on the subject matter.
- Focus on general principles, not specific problems.
- Make lab work as realistic as possible.
- Build diagnostic skill by first exercising deductive reasoning, as a prelude to inductive reasoning.
- Incorporate frequent troubleshooting exercises in the lab.
- Include a broad range of practical topics and aspects in all coursework rather than fall into the convention of focusing on memorizing definitions, stating concepts, and performing quantitative calculations.

This advice is demonstrative of the means by which Travis aims to develop critical thinking and problem-solving skills in his students.

Travis is reflective, highly articulate, and self-proclaimed 'introverted and socially awkward'. One student participant, Jason, simply said, 'he's a genius'. Regarding the instruction manual written ten years into his teaching career, Travis nonchalantly referred to it as a 'interesting project' due to the lack of instruction documents and materials for the program. What started as a culmination of 'lessons for my students and short tutorials and things like that' is an over 3000-page work on theory and application of math and sciences such as calculus, physics, chemistry, mechanics, electricity, and instrumentation. The introduction on teaching advice begins:

> If you would like to maximize your students' learning in a field of study that emphasizes critical thinking as much as (this one), I have one simple piece of advice: engage your students, don't just present information to them. High achievement happens only in an atmosphere of high expectations. If you design coursework allowing students to expend minimal effort, your students will achieve minimal learning. Alternatively, if you require students to think deeply about their subject of study, challenge them with interesting and relevant assignments, and hold them accountable to rigorous standards of demonstrated competence, your students can and will move mountains.

He goes on to discuss suggested teaching methods, faults in traditional lecture and 'the ultimate goal of education':

> When I began teaching, my belief was that teaching was a matter of knowledge and skills transference: it was my job as an educator first and foremost to transfer information into my students' minds. Now, it is my belief that my primary task is to help my students become autonomous: able to analyze complex data, turn their thoughts into practical action, and continue learning long after they have left the classroom.

Travis came to this revelation by way of a hard lesson from his students during his third or fourth year as an instructor. He used to be satisfied with his ability to deliver a wonderful lecture, but noticed upon reflection, that the better his lectures got, the less his students retained:

> They were paying attention. They were really enjoying it. The reviews of the class were rave. But two months later it was like I hadn't talked about that topic at all. They'd forgotten everything. I was really mystified. I thought what is going on here? Why am I getting, not just diminishing returns, but reducing returns with my increased effort? And one day I heard a student… well my office didn't have walls, it was sort of a cubicle, so I could hear

> everything in the classroom… I was in my office typing away and I heard one student say to another 'ah this class is great he lectures so well you never have to open the book.' And I remember just stopping typing and thinking 'oh no.' Because independent effort is a really important part of the learning process, and unwittingly I had let them off the hook for this.

This was the beginning of Travis's teaching transformation, and the implementation of Socratic dialogue and inverted classroom methods in his courses. He found it to be much more work than preparing a lesson, but the results 'are phenomenal'.

5.3.6. Dr. Phillips – President

In her second year as President at the Case Study Professional Technical College, Dr. Phillips moved to the area after more than thirty years in another state system. She began her educational career in high schools then community colleges. She also spent over a decade on the state board as a specialist in vocational education. She brings a new inclusive governance perspective to the college.

> It used to be that a very small number of folks made the decisions for the campus. Higher education doesn't work that way anymore, although it seems to in this state more so than other states. We are embarking on our first pilot year for a collective sharing of what our vision is. Now, there are elements of that that I have some influence over, but I pick those very carefully. Because when decisions are made in higher education, I think the more people you hear form, the variety of viewpoints, the better the decision and the better it's implemented.

Having come from a state where participatory governance is legislated, Dr. Phillips is able to employ the advantages of it locally, and 'leave all the bad stuff behind in (the other state).' There were more state regulations to abide in her previous role, and in some ways the local state is catching up, but Dr. Phillips has an interesting viewpoint in that she also understood what did not work well, and she is able to influence initiatives here to create a better teaching and learning environment at the school.

Regarding transforming the college and required assessments, she likes to call it, 'affirming you are doing a great job.' But there is always room for improvement and Dr. Phillips is motivated to support the instructors in their professional development while doing what is right for the students. For example, she stated

she was shocked to learn the state does not have a standard number of credits per degree program. Some two-year degrees have 90 credits, others have 120, and this effects the student's financial aid. She is bringing positive change with the support and respect of the college faculty.

Being from another state does not mean Dr. Phillips is not loyal to her college. She knows the history of the school, is passionate about its mission, and has strong feelings of the stereotypes that stubbornly plague PTE.

> This institution started out as a K-12 vocational education school, it was a high school 60 years ago. Then when the technical college system came in to being 50 years ago, we were still a vo-tech school. People still say, 'oh you work at the vo-tech school.' I say, 'No. I work at the Professional Technical College.' And so, the message is – this is an institution of higher learning. Anything after high school is an institution of higher learning. We need to conduct ourselves like that, we need to remind ourselves we are not a glorified high school anymore.

The school has changed but the perceptions persist. When asked directly about the attitudes towards learning in the trades, Dr. Phillips, for a moment, sounded tired. This is no surprise since a significant part of her career path was teaching vocational agriculture. It began then, she commented, 'and to this day, we are battling that perception.' When I asked the President if she had the opportunity to deliver a message to high school career counselors in terms of PTE, what would she like them to understand? This was her reply:

> I've spoken with counsellors my entire administrative career about the importance of what we do, the changing nature of professional technical education, the return on investment that students get right away. One, we're less expensive and students leave here without loans, and two, they get good paying jobs, enough to support themselves on their own. And they are making money while their counterparts are still going to school incurring debt. To this day, we are battling that perception. So, if you could find a phrase that would actually turn the minds of high school counsellors that a student's grade point average is not a factor in where they go to school – it's what they want to do with their life – if I could find that magical phrase, I would give it to you.

Dr. Phillips discussed the idea that high school counselors are encouraging the academically successful students to go to a four-year school because that is what they did, and she experienced the attitudes first-hand when she was a student.

> We are starting to get some conversations going with counsellors on information about (the local community and professional technical schools) but still I think if a student comes to them with a high GPA they are saying 'why are you wasting your time going to a community college'. I went to a community college and I was flat out told 'you are wasting your time, you are better than that.' That was in the 70s. You'd think we'd have a better message than that by now, but we don't.

5.3.7. Derek – Student

Derek came to the professional technical college in the worker re-training program after being injured on the job. His program offers a certificate after six quarters and a degree after eight. Derek dropped out of high school after multiple expulsions due to fighting. He used to box for sport, and that made him a target for other students who wished to challenge him. Now, in his mid-thirties and just one month away from graduating with a degree in Applied Science, Derek has done 'everything under the sun' since high school. With an easy grin he recalled a variety of jobs such as working as a master mechanic for a major auto company, carpentry, and truck driving, to name a few.

Derek is a concerned parent regarding issues in the public-school system where he lives. He believes the high school environment is harder on kids today than when he was in school. He is concerned with the current political climate causing division in the public schools, and the lack of practical career counseling. He said:

> I went to (my child's) school and they were talking about their careers going forward. A lot of schools come up and do things with (this college), but they don't. Why? Is there something wrong with the technical school? I asked, and they said 'well, we just don't do that.' We had a job fair here, and there were people all the way from (a city about an hour away) that came up to see what we do. But why aren't more schools locally visiting here? It makes no sense.

Perhaps a bit modest, Derek claims he is not an academic, and favors the kinesthetic approach in PTE.

> I like hands-on learning. Book smart? [Shaking head.] No, I just don't comprehend. But if you put something in my hand, I'm great with it. Well, I wouldn't say I'm great, but I understand it better.

Whether or not Derek considers himself 'book smart', he is now able to work through complex problems in his head, an example of high-level thinking skills. This has given him a level of confidence he didn't have prior to enrolling in the PTE program.

> When I started, I was ok with math. But now I can figure out angles and trigonometry in my head. I'm definitely… 'evolved' (chuckling). I took my brain and pushed it. And what's really cool here at the technical school is I'm getting my AA and my high school diploma at the same time. It's cool. It probably doesn't matter, but it makes me feel better.

Between being a full-time student and navigating a host of life events with his children Derek works for a wildlife organization relocating wild animals. He has endured his share of hardship, but shrugs it off saying 'you know, you have to have the hard times to appreciate the good times'. He applies this same attitude when his education gets especially challenging and practices self-reflection in order to continue improving himself:

> I just try to take each day for what it is, there are no guarantees for tomorrow. I've had some hardships in my life and lost a lot of good people, so I vowed that I would take each day for what it is. Live it to its fullest. That's all you can do. I try to be the best person I can. I used to be really shy and hardly talked at all but learning and teaching stuff - I can talk. I've talked to 1000 at a time. I reflect on those moments, how did I do, and how I can I do it better next time. Some days I want to give up, but then I think. 'no way am I going to give up I'm going to beat this.' There are quite a few times where at the end of the day I'm done. You know? I can't stare at a computer screen anymore, I can't read, my brain is dripping out my ears, I'm just done. But you just take a break and think – you know, I got it pretty good.

5.3.8. Jason – Student

In his 40s, Jason is back in school retraining after an on-the-job injury. He grew up in a rural state where he learned to drive a truck when he was ten years old, because 'there weren't enough bodies to get the work done.' Both of his parents had college degrees, so it was always a given that he would also attend a four-year college. After high school he enrolled at the university in his home town for civil engineering but left in the third year due to financial constraints. Jason worked odd jobs for a while before securing a job with a large retailer, where he stayed for ten years.

Having relocated to the Pacific Northwest, he was working in a well-paid job that afforded him flexibility to spend quality time with his family, when he suffered an injury:

> Now all of a sudden, the rug is pulled out from underneath me. I couldn't do what I loved. So, I was looking around at what I could do. I've always been interested in how these little gadgets work, I've always torn stuff apart and fixed it. Mom would give me the VCR because it's not working and say can you figure it out, so I just learned because it was hands on. I looked around to see what schools taught what. I chose this school, because logistically it's close to (family).

Jason has a strong altruistic work ethic and says he was raised to respect and help people. He works hard and is also full of innovative ideas. Seemingly born with an entrepreneurial mindset, he shared the following story of when he was in elementary school:

> My cousin gave me this rabbit pelt and my mom said, 'what are you going to do with that it's got fleas.' But I was ten at the time, so I hid it, as most kids would. I threw it in a shoe box under my bed. Then one day my teacher was talking about losing her bookmark. So, I went home, and my mom used to sew so I went with her to the fabric store and bought some jiggly eyeballs. I cut the rabbit pelt into strips, glued the jiggly eyeballs on and I made these little hairy worms with eyeballs. I took one to my school and gave it to my teacher and said, 'here you go, here's a bookmark.' It was flexible so when you laid it across the page it was nice and flat. Everybody thought it was so cool, so I started selling them for 25 cents. I probably could have gotten a dollar for them, but whatever. I cut every bit of that rabbit pelt up and sold it as bookmarks. I made like $9 dollars and 25 cents, then I bought my brother a cassette tape he really wanted. I think it was the Cars.

Jason knew he was 'wired different' from an early age and carried the mindset that he could do anything. When he had a vision, he does not limit himself by the known and unknown, he simply assumes he can figure it out. His excitement and positive attitude outweigh anything he lacks at the time:

> Like if I want to build this device, but I don't know how to cut it because I don't know how to use a CNC machine… well, there is a program here with people who know how to do that. So, I just say this is what I want it to look like, they can put it in the CAD. All we need to start is this this sketch on a napkin. There is always some way, somehow.

Jason is excited about the program he is in because it is going to help bring more of his ideas to fruition. Coupled with his work ethic and inherent respect for all people, he's excited about his potential. It is another means in his capability to serve.

> I was raised to respect people and help them. I don't have an engineering degree, but I can read the schematics and know the terms and can build it. So, I will work hand in hand making new products.

5.3.9. Mark – Student

Mark and I began our conversation with a brief exchange about Abraham Maslow's hierarchy of needs to which Mark replied, 'Is the triangle the correct representation? I feel like things happen in different orders, and in different amounts'. Between high school and nearing the end of his technical degree at the college at age 24, Mark had attended three colleges in three different states. He began at what he called a 'normal college', a four-year university, in his home state for one year before moving nearly 2500 miles away to enroll in a PTC. He felt the town there was not a good fit for him, so he came to the case study college since his sister was in the same town. The program at that time was in transition and was not, according to Mark, a 'learning environment. The teachers were not actual teachers, so I went back home to learn how to weld'. When I asked about learning how to weld, he replied:

> Welding was just… well, I have this idea that I'm going to build something big and complex, and welding is just one of the steps to that. It's maybe not the smarter way of doing things. But it's a longer route of getting to mechanical engineering with more of a foundation.

After he had his welding certificate, the program at the case study school had two new instructors so he returned and has since been here. Mark appreciates that the program he is in now is relaxed but challenging, and the teachers take time to answer questions one-on-one: 'We get told to build things, but not always how'. Much of his learning involves self-directed problem-solving:

> It gets overwhelming at times. You definitely have to be really organized about it. It seems if I am more organized, I can get through it, because it's so complex. If something goes wrong, it's most likely my fault. So, trying to make a method to take out my own human error – it's pretty neat.

Mark was encouraged to go to a four-year college from high school but had an inspirational experience that prompted him along a different route:

> I'm very creative. Originally, I was going to school for engineering. My high school was like, 'go-to-college-go-to-college' and did not say anything about technical schools. But in high school I was always in shop class – I'm not very good at taking notes and things like that – so anyway, I met a retired engineer who had made this model steam engine. Basically, he could make anything. I thought that was really cool and I wanted to do that.

Fittingly, Mark had a job secured after graduation for a railroad company. He's looking forward to the experience for its uniqueness, and how it will involve all aspects of the locomotive: electrical, piping, fabrication, and inspection. 'Like a jack of all trades in one position'. Given his current skillset, this job will require continuous learning, which he felt prepared for and more confident in given his education. He's grateful for the opportunity to work with his hands and appreciates his skills.

Mark has always valued education. He spent his high school summers in vocational courses. At first, he was taking them in order to graduate early but then ended up staying all four years. He has a keen eye for quality instruction and recognizes the changing nature of the trades: 'What I notice is it's really hard for these hands-on programs to find good qualified instructors.' He imagined the reason is most can make more money working their trade than teaching it. Considering instruction, Mark gave this example:

> If I made something like sunglasses, it's a very small thing. But if I was teaching, I might work with twenty people. I could solve more problems and make more things.

Very self-aware, he didn't see himself being able to teach yet because 'I feel like I'm not old enough to do that yet, I wouldn't be doing the students justice'. Instead he wanted to apply his skills in the field, continuing to learn, before he can call himself a master tradesman. A bit of a philosopher, he commented, 'When I leave here I can technically say I'm a (skilled craftsman), but am I really?'

5.3.10. Rick – Student

After serving for twenty years as a skilled technician in the armed forces, Rick was retraining at the technical college. He took early retirement from the military due to health reasons, and already holding two degrees from a two-year community college, wanted to attend a four-year college but came to the PTC at the direction of the military. The priority for Rick was being employable again by retraining, and enjoy school without the pressure of needing to work immediately due to having a retirement income:

> For the next twenty years I really want to be able to enjoy going to work and be kind of sad when I have to leave work. I don't have to make a certain amount of money because I'm stable now. So, at this transition I can take my time.

Rick appreciated the freedom to take his time because 'the way you work with civilians is different than the way you work in (the military)'. His mindset was to follow orders, not ask questions, and to take the most direct path from start to finish:

> My mentality is: you want me to do it? Fine, I'm going to do it. When I'm done I might ask the purpose, or what I was supposed to get out of it. It's a mindset. Do I really need to know why? No. My instructor said do it. It's just that easy.

Rick was a tutor in his program as well and felt a lot of appreciation working with others in this capacity. He tutored first year students struggling to keep up with the class on their own. It was also helping him shift his perspective. He enjoyed working with people and has a no-man-left-behind attitude, especially with group projects:

> I can give a little one-on-one instruction on what the instructor meant. And you can see the lightbulb go on. It lights up like "a-ha" and that's my gratitude. That also reinforces what I learned.

Rick grew up on the east coast and his primary education was in a private school. 'I'm used to wearing a uniform, and keeping my composure a certain way', he mentioned with a laugh. His parents decided it would be best for him to go to high school in the public system and 'it was complete culture shock'. He found his prior schooling had him well ahead of the public-school lessons, so he became a class clown in order to fit in.

One of the reasons he wanted to go to a four-year school was to experience the lifestyle he imagined there. Rick said:

> I wanted that experience of a four-year university, that lifestyle. But I don't think it would have made me any better than coming here as a person, or as far as my preparation. Even with a four-year engineering degree, I'd still have the same mindset. 'This is my task, I'm still going to do my task.' So, you know - to just assume someone is smarter for having a certain degree - I don't think so. I got an 'A' in calculus three. I can do the work, I just went a different avenue.

5.3.11. Wes – Student

Wes was the oldest of the student participants, retraining after an illness prohibited him from continuing his previous employment. Immediately after high school Wes had worked as a mechanic and welder for about twelve years. Throughout some significant life challenges, he changed careers and became a financial advisor then insurance salesman. Wes is proud of being a hard worker and having strong ethics, so not being able to work damaged his confidence:

> I took this career analysis test and it came up with (skilled trade) as something I could do. I said, 'well, I have to do something because insurance wasn't working because of my self-esteem'. My self-esteem really wasn't there at all.

After years of working with the public, Wes was training for a skilled trade job to allow him more flexibility, and the ability to step away when he needs to take care of himself. He has undergone surgeries as recently as the previous year but managed to only miss one day of school. When committed to something, he works hard: 'When I get a job, I'm all in. If there is something we have to stay late for, count me in.' In addition to being a dedicated worker, Wes learned critical thinking skills in the workplace when he was young, thanks to his boss in a shop:

> When I was first a diesel mechanic, my boss was good. I'd ask him what to do and he'd say, 'what would you do if I wasn't here?' The first thing that came to mind is 'what a smart-alec', but then I'd say well I could do this or that. If I was on the right track he'd say, 'ok'. If I wasn't, he'd give me another idea. But he always made me think first. I attribute that to him today. I always think.

5.3.12. Mitch – Student

When Mitch met me on campus in a library conference room for our interview, his first comment was of being glad I emailed him. He did not know specifically of 'transformative learning', but he had lived it and was eager to share his story. Mitch's story is of resilience and motivation. Having experienced significant hardships shared in the short hour he was interviewed, he provided evidence of two instances where he was down but found the inspiration to continue trying to make a life for himself and his family.

Mitch dropped out of high school in tenth grade. He knew he could get good grades, but guessed his character was not a good fit. He spent time in juvenile detention, then attended the local community college for a while, but was expelled for fighting. He worked at a hospital for a while. He shared:

> That wasn't really going anywhere, and I just wanted to get out of here. I met my wife, proposed to her, two weeks later signed up for the (armed forces) and was gone. I got into a special force unit. I just took off because I can't do anything else with my life. I was going to be active duty military, marry my wife, bring her with me everywhere, and life was going to be dandy.

Mitch thought he'd found his dream job, but injuries followed by several surgeries forced him into the reserves. Mitch admits to having had a negative attitude about life and feeling sorry for himself:

> I started realizing my life was not going where I thought it was going to go. I could just give up, but by that time I was married and had a kid on the way. I didn't have any money and I'd lost my full-time job. So, it was either give up, get depressed and let life take its course, or actually try to do something.

His wife encouraged him to apply for the program at the PTC, thinking it would at least provide him some useful skills. Mitch was skeptical and had a less than favorable impression of technical school. From conversations with high school advisors, his perception of the technical school was 'almost like plan Z'. He shared a conversation held while he was getting expelled from school during which the Principal told him, 'if worse comes to worst, he could go to the technical college'. Mitch was 16 years old at the time.

His earlier impressions of the college, and the poor impression he got from high school faculty were 'really sad' for him having since experienced the quality of

education. He said, ‘It gave me a purpose, gave me a goal’. Mitch gained a new perspective on PTE, an appreciation for his trade, and practiced self-reflection on the changes in his life:

> I love doing (this craft). There is a lot more to it than people think. I used to think it was no-brainer work, but it is complicated, and you really have to engage yourself - engage your brain and gain the knowledge before you can do a good job. I might not stay in it forever, but I just find myself a lot more open minded about the possibilities out there. I just feel like even if I walk away from this industry I haven’t lost anything, and I’ve gained something that I can’t replace. The relationships here, the longing for knowledge and the understanding of how much it means to me. All those things mean something to me. These two years have just changed me as a person.

5.4. Summarising participant experiences

5.4.1. From Industry, to Industry

A notable commonality among the instructors is they were all from industry and none of them had formal teacher-training prior to being hired as an Instructor at the PTC. Two of them had tutoring experience, and one instructor, since being hired, has earned a Master’s in Education. The youngest Instructor interviewed had only been teaching for three years, but the other four instructors averaged over 18 years each teaching at this same college. All of the instructors reported being essentially handed the keys to their building and wished ‘good luck’. This was a disorienting dilemma (Mezirow 1975), and they experienced a significant period of their own transformation in coming to understand their new role as a teacher. When I asked Dr. Phillips about transformative opportunity in the college, she gave kudos to the faculty, and also recognized the most effective teachers are not always the ones with the most teaching credentials.

> It could be a factor of who our faculty are. By and large they are from industry, so they are bringing tremendous technical knowledge, but not so much on how to teach. Although when I say that, I think of the general education faculty. All they know of teaching is what they experienced at the university, and the university still tends to be pretty traditional. You know, they are not doing contextual type learning or anything. They tend to be chalk and talk and large classrooms. So, when people say professional technical folks don’t know how to teach I say, ‘hey, my English folks don’t either’.

5.4.2. Creating the opportunity for transformation

All of the instructors recognized the continuing technological advances in their trades and how it impacts their curriculum. In order to prepare students for a career path, they cannot focus only on skills for the current job market. Simply learning a 'task' as many outsiders perceive the activities of a professional technical institution to be, will not suffice over time in many skilled fields. Regarding the change in his teaching methods, Travis wrote:

> This shift in philosophy happened as a result of contact with many employers of my students who told me the most important thing any student could learn in school was how to learn. In life, learning is not an option, but a necessity, especially in highly complex fields. Any (trade) technician who stagnates in their learning is destined for obsolescence. Conversely, those with the ability and drive to continually learn new things will find opportunities opening for them all throughout their careers.

The student participants spanned a thirty-year age range, and none of them were at the college as their first choice out of high school. They come from a variety of backgrounds and have experienced a host of life-events during their schooling, including; birth, death, marriage, divorce, life-changing injuries, incarceration, and reconnecting with family.

5.4.3. Recognition of perceptions

All three groups, the instructors, students, and President, were asked about their experiences with regard to perceptions of the college and of the careers for which they were in training. I inquired regarding how they came to know about the college, and whether this information was shed in a positive or negative light. The idea persists that the four-year college path is the best option post high school, and anything other than that, save for perhaps the military, is a shortcoming. While a couple of the participants experienced explicitly negative attitudes towards skilled trade work from High School faculty and staff in the schools where they studied, most noted an absence of the option altogether. It simply wasn't promoted in lieu of the ideal that the university is the best way to go, and the only promoted path for anyone with a strong grade point average. It seems in the participants' high schools, PTE was the fallback plan for those who had poor grades or social struggles.

The participants do not think of themselves as academics, even though they demonstrate high level thinking skills, understand the physics and mechanics of complex technology, and can work through and solve compound mathematical equations in their heads while using tools with their hands. Three of the instructors admitted to never having thought of teaching until someone else suggested the idea and encouraged them to apply, and now they engage in their own continuing development of effective pedagogical teaching approaches. A commonality of the instructors and students was their confidence in working with their hands; their ability to repair and create something tangible. Before moving on to the results of the thematic analysis and further evidence of transformation in professional technical education, I'm reminded of a passage by Matthew Crawford in *Shop class as Soulcraft*, having left a job at a 'think tank', regarding the intellect in working with one's hands:

> It may be that I am just not well suited to office work. But in this respect, I doubt there is anything unusual about me. I offer my own story here not because I think it is extraordinary, but rather because I suspect it is fairly common. I want to do justice to institutions that many people have, but which enjoy little public credit. This book grows out of an attempt to understand the greater sense of agency and competence I have always felt doing manual work, compared to other jobs that were officially recognized as 'knowledge work.' Perhaps most surprisingly, I often find manual work more engaging intellectually (2009:4-5).

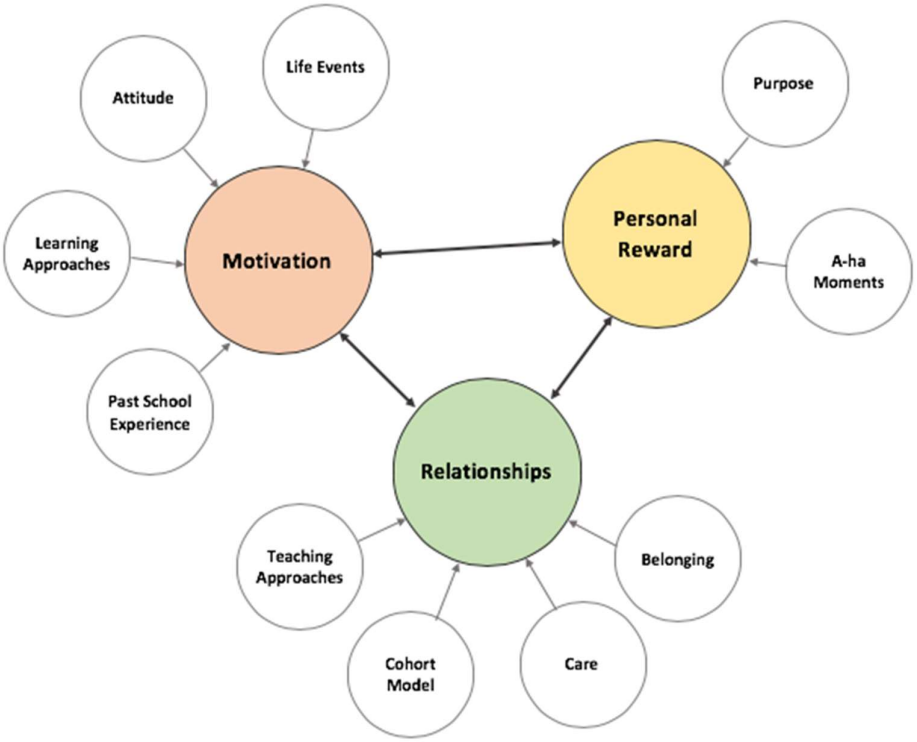
Chapter 6. Thematic analysis findings

This chapter contains the results of the thematic analysis conducted to respond to the research questions:

- Is transformative teaching and learning present in a case study PTC?
- If so, is transformative teaching and learning explicit or implicit?

Three themes were derived from the interview data: self-motivation, relationships in education, and satisfaction or reward from one's accomplishments. As discussed in the literature review, motivation is a prime factor in adult learning, especially intrinsic motivation in pursuit of an improved well-being (Knowles 1990). The importance of relationships in education comes in developing trust, caring, and a sense of belonging that create an environment safe for transformation. Equally important is a sense of personal accomplishment. The themes and sub-themes will be presented with evidence from the data. I have again intentionally included some lengthy participant quotes in order to continue conveying their voices. Figure 6.1 is a visual display of the thematic analysis results. The main themes are supported by sub-themes and are related to each other multi-directionally.

Figure 6.1: Map of Themes



6.1. Global theme: Motivation

The first global theme highlights the importance of motivation to the learning process. The participants' motivation served to carry them through difficult challenges in both the classroom and life. It also prompted their engagement at the PTC, despite sometimes poor previous school experiences. There are a variety of factors such as family members and prior employment, but as adults, they each took the steps necessary, choosing to teach or learn a trade amongst other options. For example, Mitch enrolled at the case study college at the prompting of his wife after his injuries were preventing him from continuing in the military:

> I wanted to be in the military and I thought I had my dream job set up. So, if that isn't going to work then screw life. I don't need anything, and I don't want anything. But with the help of my wife, I applied maybe two or three weeks before the program started. I talked to an advisor who said its way too late to try to enroll. He was almost 100% sure I wouldn't get in because the class is over-filled. But I said, you know, if I get in, I'll go for it. If not, I'll keep sitting on the couch feeling sorry for myself.

Whether someone is very motivated, or experiencing a lack thereof, I found motivation prominent in the data. Motivation is a personal and internal driver that compels us to not just exist daily, but to move forward. There are external factors, such as Mitch's wife encouraging him, but the action is one's own. Motivation is important to this research because as discussed previously, transformation requires the willingness of the individual. Transformation is not compulsory, and the events that motivated the participants provided some groundwork upon which transformation might take place. In order to experience transformation, the student must be motivated for change.

Motivation emerged from the data from the following sub-themes:

- Life events
- Attitude
- Past school experiences
- Learning approaches

These sub-themes helped define the participants' paths that led them to education in the skilled trades.

6.1.1. Life Events

The data suggests the participants have responded to life events with resilience, eventual positive attitudes, and renewed motivation. Life events are significant experiences that influence our paths. What constitutes a life event and the effect it has is determined by the individual, and in turn is a factor in motivation as experiences affect the way we think and give us cause to act. For example, having a child might inspire someone to seek a certain job that allows for time with the family, or more pay in support of family activities.

Each of the participants had multiple past and current life factors such as family hardships, children, divorce, injuries, legal or medical concerns, and financial stressors. In the midst of their adult lives they are motivated to learn for their future goals and well-being, despite and because of the events that led them to the school. Andrew Martin, in 'Motivation and academic resilience: Developing a model for student enhancement' describes 'learning focused' students, as 'motivated to attain mastery rather than outperform others' (2002:39).

> Importantly, learning-focused students are resilient to setback because they see poor performance or setbacks as reflecting on their effort and strategy and so respond to them with greater effort and better strategy (Martin 2002:39).

Gordon Rouse also notes the importance of resilience, calling it 'the ability to thrive, mature, and increase competence in the face of adverse circumstances or obstacles' (2001:461). Derek's comment, when tired of studying and wanting to give up, then thinking 'no way am I going to give up I'm going to beat this', is a great example of learning-focused resilience. This attitude has developed over time and experience, and fuels motivation.

Each of the interviews began by asking the participant about how they came to be at the professional technical college, and in each of the replies were significant events that helped determine their paths. Wes married his high school sweetheart and they came to the town several years ago when his sister-in-law lost custody of her child. He said, 'We went to court, all of us. (My in-laws) got full custody so we moved up here to help them'. After years in other jobs he was in college for the first time, and almost a grandfather. Travis was raised in the area but had always envisioned residing elsewhere as an adult. After attending school in another city, he found himself back in the county due

to a lucrative job offer. After several years working he was then nearby and made aware of the instructor position when it was posted. Jason moved to the area to be closer to his child after a divorce, so when looking to return to school, the case study college was a natural choice.

College itself is a life event. Regarding his students Dave said, 'you see huge growth and honestly, we see a lot of maturity take place with the younger students'. College is also the backdrop of other events. In speaking about the level of focus in the second year following an internship, Dave went on to say:

> They understand the relevance of how important the (learning) is, so I'd say they all give it strong effort. Unless their life is blowing up, you know, or they are breaking up with their spouse or something like that. We always have stuff like that going on because these are adult learners.

A host of events occurred prior to each participant coming to the college, but equally interesting are the events that happened during the school term that significantly fueled the students' motivation. Events during the program allowed the instructor to demonstrate caring, thereby strengthening the student-teacher relationship, inspiring further motivation. This is an example of the circular transformative process and how elements of the themes are closely woven together.

When asked if there have been any life events while in college, Derek said, 'it's been non-stop, it's what happens when you have kids'. His positive attitude helps, and in a way, Derek is still a fighter, though he has long since put down the boxing gloves. Martin proposed 'academic resilience' to the question of why some motivated students are halted by obstacles and others 'pick themselves up, recover, and move on' (2002:35). In Derek's case, having grown up without a father, being expelled and not finishing his secondary education, and still working hard without self-pity or resentment, it appears his resilience is more than academic. He recovers and moves on because that is just what he has always done.

During the first year of the program Derek's biological father, whom he'd never met, contacted him. He said, 'I found out I have two sisters (on the east coast) that are also in their thirties'. Calmly speaking as if talking to his biological father, Derek said:

> I don't need nothing from you I don't want nothing from you. If you have the time and want to meet up, that's fine, but if I'm busy, sorry. You had 36 years to figure it out, you know? I'm good.

Despite the reservations with his father, Derek is forging a relationship with his sisters and this motivates him to complete school. He added:

> I'm more excited about the aspect of my sisters. You know they have the same story that I have, but they aren't to the point where I am yet. They don't have their high school diplomas. Getting their GEDs they barely made it through and I'm, you know, graduating from college. It actually inspired my sister. She just enrolled in college. She's like 'how do you do this?' and I'm like 'I know it's tough!' It's bringing her and I closer together. We've only talked for a year and I've never met her face to face. But it's cool because she said now she has a big brother and she kind of looks up to me.

Derek left secondary education before completion, experienced frustration with his children's school, and handled news of family in such a way to find more motivation for his own education and became a mentor to his sister. In addition to life events, attitude is a factor in determining how the events are handled. Derek was motivated to grow from at one point dropping out of school, to now being a role model for education to his family.

6.1.2. Attitude

The participants' attitudes towards life events, school, and the future came across strongly in the interviews. Attitude, as a way of thinking about things, directly supports motivation. Before coming to the college, Mitch's attitude was poor due to not being able to pursue his previous plans, to the point of recognizing he was feeling sorry for himself. He wasn't motivated to attend school and was just going as something to do. Mark, on the other hand, had a vision and goal and was working on assembling the tools to achieve that goal. Both, in recognizing how they felt about school and their ambitions, demonstrate self-reflection and an understanding of where they were was not where they wanted to remain.

Merriam-Webster (2020) defines attitude as a feeling, emotion, or mental position toward a fact or state. The nature of one's attitude may vary greatly. Attitudes drive our behavior. For example, John's attitude was both helpful and

open to learning while employed at a shop prior to becoming an instructor. His attitude showed he was motivated by challenges:

> I started out helping a guy and there was a (machine) sitting there. He said 'yeah, they get it running whenever they can get someone from the (other) shop to come over. So, I went to the boss and said train me to run that thing and I'll run it. He asked if I had experience and I said no… but the last guy I worked for, they had (the same type of machines).

John was bored and 'a little depressed' in university engineering classes but motivated to seek out opportunities to learn in his job. Knowles (1990) tells us that adults are motivated to when they believe it will help them, as John was self-directed in his learning in the workplace as opposed to the university.

Attitude and personality factors also influence our actions and motivation. Jane Castles (2004) cites psychological research in her study on '*Persistence and the adult learner*', supporting evidence that certain types of people with positive attitudes are more persistent and therefore more successful in their learning. Derek stated that he enjoys a challenge and considers himself 'pretty upbeat'. He tries to keep himself busy while maintaining a positive outlook despite past troubles. His wife was also in school at the time of the interviews and he said, 'she worries that she is getting a 'B' grade and I'm happy I paid the power bill and we still have a little money left. That's life'. He admits that at times school has been a struggle, smiling:

> My forehead is flatter. I'm the type of person that likes a challenge. My wife says I'm a problem solver. During those times (when coursework was hard) it was more about being persistent until I got it in my head and was finally getting through it.

Another student, Jason, was motivated to learn because he has always been curious. He grew up with a natural understanding of how things work, without knowing the theory behind the mechanics of an object. When faced with the choice of what to study, he got excited about his program and felt confident he would succeed.

> That's kind of how I got into this program, I wanted to see how stuff works. I have a knack for understanding, but not really knowing exactly. So, what they've taught me here, I just started sucking it up because it started making sense so fast. I love the fact that I'm learning.

For Jason, the program is providing a foundation to something he already loved doing. He mentioned that he went to a four-year college after high school because both his parents had university educations, so it was assumed that he would do the same. His keen ability to work with his hands and fix household objects is an example of someone who may have fared well with a professional technical degree sooner, had the option been presented equitably.

After decades in the armed forces, Rick's attitude is a factor of what he calls his 'military mindset' and his financial position. When asked why he's back in school, he said:

> The military asked me to do it. They wanted to retrain me because I have a disability. And because of that, you also get perks. For instance, when I go back to work, for the first full year, the government pays half my salary. That's why I'm not worried. I want to just enjoy this. I love to do things with my hands, and this is a good way to understand the industry standard. I know what the military standard is, which is why most people want to hire you, because the military standard is higher than the industry standard. But I want to understand what is required of me before I jump into something. I want to really understand the job and if I'm going to like it. I can go back into (a military related career) but I figured, I retired from that so let's try to do something different, something that I might enjoy more. I don't like it I can always go back. This is just an avenue to open up more doors.

Like Jason, Rick appreciates working with his hands and values his education for providing the background and foundation to develop his skills. His attitude is clearly not about only going through the motions to get the degree, but to have a sense of expertise in his field, to really value his job, and to be grateful for his work.

Each of the participants carried an attitude that determined how they handle inevitable life events, and that allows them to be motivated and open to transformation. Whether by persistence, curiosity, or security they each behave according to their point of view. Their attitude towards learning is, in part, influenced by their past school experiences.

6.1.3. Past School Experience

The participants' past school experience influenced their attitudes towards higher education and their feelings about support from faculty and staff. Some of the participants in this study did not report favorably of their past school

experiences; Travis was bullied, Mitch and Derek were expelled, and Mark felt he had poor study habits. Others felt successful in high school, such as Rick and John, because it was easy for them. Dr. Phillips was also an academically successful student so was told she needed to attend a four-year school so as not to waste her talents. Regarding his reasons for leaving school, Derek sighed and said:

> There were a lot of things that contributed to it. I'm kind of easy going, but if you push the right buttons, I will fight. I boxed and about half the (athletic) team wanted to find out about it. I was in seven fights in three quarters. Before the last fight they had just put cameras up and you could see on the film that I'm standing at my locker and they come to me. But I got expelled. I just thought I'm done with this, I'm out of here.

The distractions from people wanting to fight, and the lack of support from faculty and staff in supporting Derek's opportunities to engage in learning resulted in him deciding high school just was not worth the trouble. School was easy academically for Mitch, but he also had difficulty with disruptions. He shared:

> In high school, learning wise, it was so easy for me. I knew I was smart enough. Acting out and saying 'who cares' was just the way to go for me. I felt like I was thrown into a giant ball pit and everyone gets the same thing. That was frustrating to me, that was another reason I didn't want to be there. I figured I might as well just leave and go to work or do something else. I was constantly getting in trouble, so why waste my time, it just doesn't make any sense.

Carol Kasworm (2008) recognized how these experiences may affect the decision to go to college in addition to typical factors in adult lives. Kasworm wrote, 'Drawing on their past life experiences and their evaluation of their past learning, these individuals enter the classroom with an evolving and sometimes conflicted learner identity' (2008:28). However motivated they are to learn, the student participants may need to reconcile past experiences in order to be successful.

Rick provides a different type of example, attending a public secondary school after a private primary education:

> My family decided it's probably best for me to go to high school in the public school. It was complete culture shock. Completely. Who

> are these people and why do they act like this? What that made me do is conform to them. I was far advanced because of the private schooling. At the public school I was like, 'I already did this'. So, I became one of the class clowns to fit in.

Derek, Mitch and Rick are examples of students in secondary public education struggling to fit in to the structure that is less than ideal for them. Mark admitted to being less successful in an academic setting but found a space he enjoyed in the shop and that was where he found his inspiration for the multi-college journey post-high school. Mark said, 'In high school I was always in shop class. I'm not very good at taking notes and things like that but I was still learning'. Poor secondary school experiences are cause for hesitation when considering college, and the motivation required to overcome this and exhibit a positive attitude in order to be successful is commendable.

As an instructor at the PTC, Travis looked back at his time in high school and the impression he has of education. Much of the curriculum involved 'surface' learning (Biggs 1999) where the goal was merely to finish the class, instead of finding a way to make the topics meaningful and promoting transfer beyond the classroom. He said:

> I think we unwittingly teach a lot of students that education doesn't matter because of the way we emphasize it or fail to emphasize it. The seeming irrelevance of a lot of the topics.

As a student Travis experienced pressure to attend a four-year college because he was successful academically. This contradicted his career desires, and his own perceptions of the skilled trades. In speaking of high school counselors directing him to a university, Travis said:

> I took offense to that because I saw in my dad an amazingly skilled man, who could fix anything. Seeing the level of creativity, the intellectual engagement, albeit, not in a traditional academic way. He wasn't writing or reading a paper, but he was definitely using his noggin in ways that were not respected by my high school counsellors.

Dave is also aware, as an instructor, of the students that are pushed towards trade school by guidance counselors:

> I would say the challenge has been and continues to be nationwide that it's the student who is struggling academically or had

> addiction problems or life problems… 'you'd be a good mechanic'. And unfortunately, those people typically don't succeed because this is such a technical trade. It's very technical and a very high skilled industry. And those people who are sent here by a high school counsellor or a career center; they have no idea what they are getting themselves into.

Students encouraged to go to a post-secondary education institution, based only on their academic standing without any consideration of their passions or interested, may be lacking the self-motivation required to be successful and satisfied with the endeavor. John went to a university un-motivated and 'despised it'. When he was asked what he thinks motivates his students, John replied:

> They want to make stuff and they want a job. The other thing you need is an attention to detail. It's got to matter to you that things are right. It really does, or it just won't work. That's the two traits that seem to drive people the most, and if you have those two then everything else will sort of fall into place: if you are curious and interested in making stuff, and actually care that it's correct when you are done.

John noted that motivation, a curious attitude, the desire to learn and get it right are key to success in his program. Students are succeeding despite, and perhaps because of, past school experiences. Their attitude is defined by how the individual reacts to events and chooses to move forward as a result. Schaller (2017) recognizes school experiences differ greatly from student to student. One may love to read and write, and enjoy academic success, whereas the same activities could cause a great deal of stress for someone else. 'When students feel as though they are not meeting the standards set forth for them, this may impact their motivation negatively' (Schaller 2017:5).

6.1.4. Learning Approaches

How the student approaches learning depends on personal factors, such as their background and personality, and interest. John Biggs (1999) discusses Marton and Säljö's 1976 concepts of 'deep' and 'surface' learning as approaches students take depending on what they perceive they need from the learning. Surface learning is for a short-term purpose, such as to pass quiz. Deep learning involves understanding the meaning of the topic and being able to conceptualize their application elsewhere. He wrote:

> Meaning is not imposed or transmitted by direct instruction, but is created by the student's learning activities, well summarized in the term 'approaches to learning'. A surface approach refers to activities of an inappropriately low cognitive level, which yields fragmented outcomes that do not convey the meaning of the encounter. The deep approach refers to the activities that are appropriate to handling the task so that an appropriate outcome is achieved (Biggs, 1999:60).

He goes on to say, 'education is about conceptual change, not just the acquisition of information', (Biggs, 1999:60). Bigg's discussion regarding approaches to learning is relevant to this research as it relates to the student's motivation and intellect, and their opportunities for transformation. The self-directedness of a deep approach to learning is apparent in Mark's reasoning for pursuing the trades. He said, 'I kind of have this idea that I'm going to build something big and complex, so welding is just one of the steps to that'. When he learned to weld, for example, it was not surface learning fixed to that situation. He envisions the applicability of that skill to another project. Mark experienced how the instructor has a significant role in the student learning. He attended the same program years prior under different tutelage, left for a different school, then returned after the current instructors were hired. He said:

> The previous instructor was here for over ten years or so. He was really good at what he does, but he wasn't a 'teacher' per se. you just showed up every day and did what you wanted. So, most of the time people were just sitting at computers like just screwing around. It wasn't a learning environment. The teachers now answer your questions, and they don't act like they don't have time for that. And they plan out projects and show things. They have goals for the program, and structure, and they structure things that will carry on over to the job.

Rick also recognized the difference between surface and deep learning. He said:

> There is a difference in how you learn here versus other programs and colleges. Here you're given an idea, and you are to take that idea and take it happen. There is a difference between someone who just wants to get through it, and someone who wants to get something out of it. That can be really challenging because usually our projects run about a week so what happens is you don't have a lot of time. You're trying to build stuff while you are learning it, and most of the time it's trial and error. And mostly error. But I guess that is what the satisfaction is – to be able to see it. I don't really know what I'm doing when I'm jumping into this, but this is what I'm able to produce.

Mark and Rick demonstrated ownership of their approach to learning, and how it is important to them not to only satisfy course requirements for graduation, but to obtain applicable skills for future use. Rick commented, 'We are being taught to be employed, to be useful'. This is a forward-thinking application of un-siloed skills.

The program structure of learning theory in the classroom for part of the day followed by practice in the shops is key to the successful transfer of learning (Daffron and North 2011) and theory to practice. The participants shared their appreciation for a challenge, and especially the development of problem-solving skills through hands-on learning. Derek recognized the learning won't stop once he graduates:

> That's what I'm looking forward to - no matter what, it's going to be a challenge. There is going to be new stuff coming out all the time. There's just so much to learn, you know, and if you can learn something new each day, you're doing good.

The structure of the program, and the emphasis on deep learning and problem-solving shows that the students are not only learning specific skills, but they are learning how to transfer those skills to new situations. They are learning how to learn and are able to use their skills to think their way through new problem. Regarding the conceptual leap in problem-solving and how much there is to learn, Mark commented:

> It gets overwhelming sometimes. You definitely have to be really organized about it. It's so complex. You definitively have to have a method. Trying to make a method of taking out your own human error. It's pretty neat. I've definitely learned to not just straight out ask, but probe people on what (the instructors) know and their experience.

Many of the participants, based on prior learning experiences, do not consider themselves academics and appreciate the kinesthetic approach the PTC offers in order to facilitate deep learning. Their attitudes and approaches are influenced by their previous experiences in school. Knowing the students in general may have not felt successful in precious academic programs, and given the hands-on nature of the skilled trades, the instructors employ kinesthetic teaching methods that promote critical thinking. The students regarded the challenge as

noteworthy and were gaining more satisfaction compared to previous high school and post-secondary programs.

Transformation cannot be forced upon a student. The individual must be ready and willing to change. In this vein, self-motivation is key to successful learning and a step towards transformative education. Their motivation was molded and displayed by life events, attitudes, past educational experiences, and their approaches to learning. Each participant, in being successful, portrayed a positive attitude towards the learning, even when they did not have a positive attitude about the school before they started. The combination of being a self-directed adult and seeking to learn a trade demonstrates purpose and an interest in relevant learning opportunities. This self-motivation is both the impetus and part of the cycle in transformative potential at the professional technical college.

6.2. Global Theme: Relationships in education

The next theme is the importance of relationships in education to successful learning and transformative opportunity. Approaches to teaching and ways the instructors demonstrate care facilitate relationships. The cohort program structure present in all the PTC programs assists in developing a sense of belonging for the students in a safe learning environment. The instructors challenge and actively engage with the students as a group and individually in the day to day learning to facilitate relationships and inspire successful learning.

> I'm looking for grit, perseverance, attention to detail, accuracy, practice. But I've been right there beside them saying, 'hey that's great, but how about this'. Often, I'll use my camera then I can show them, 'this is what you are doing, and if you do this maybe this will work out for you better'. So, it's that one-on-one style. And there are sixteen students out there. Sixteen or more times a day you are checking everybody and see where they're at (Jack).

Each participant recognized the people around them as having some influence on their lives. The more tenured instructors mentor the new ones, and they visit each other's classrooms to learn new teaching methods. They have lunch together where they discuss their curriculum and students. The teacher-student relationship is apparent in the way they spoke about each other during the interviews, sharing stories of success and admiration. The students worked in

cohorts and became very close over the two-year programs, forming life-long relationships.

The thematic analysis generated the words ‘cohort’, ‘caring’, and ‘sense of belonging’ repeatedly, and from this the main theme of relationships in education is strong, especially as it related to transformation. Having respect for peers and the teacher-student relationship provides the opportunity to learn and grow from another’s perspective. The relationship is based on trust, and within that is the potential for transformation. Regarding relationships with students, Travis said:

> What I’ve found over the years is that a teacher – student relationship is still a relationship, they are inherently social, and they are based on a level of trust. If you don’t have trust you really don’t have grounds for the relationship. So, you have to establish that trust. I’m here to help you. I’m not here to be your overlord, I’m not here to give you pointless assignments you’re going to forget about as soon as they are done. You have hired me to help you get a step into this brand-new career.

The teaching approaches, demonstration of caring, the cohort model, and a sense of belonging present at the PTC are discussed here, with evidence from the data, to support the role of relationships in transformative learning.

6.2.1. Teaching Approaches

The instructors recognized many of their students do not consider themselves academically strong. Some of the students felt that way personally.

> What has been really hard is being in a job then going back to school. Honestly, I was really nervous. I didn’t know what to expect. I’m not good with bookwork. That was one of my big fears (Derek).

This assumption, whether real or brought on by faulty opinions leveraged by previous educational influences, can create a barrier to learning that the instructor needs to surmount in order to help the student most successfully receive the education. Dave shared that the secondary education advisors’ habits of sending academically unsuccessful students to the PTC does not always turn out well for the student.

> We still battle that mantra of ‘well, Johnny, you’re not good with your head, maybe you’re good with your hands’. We still struggle

> with some of that mentality from the high schools. I would say that most of our students that are successful come here on their own path. We have a number of counsellors that will come through our programs and every time they say, 'I had no idea it was this complicated'. Every time that happens we see their attitude change. They aren't trying to purposely harm the program, they are just naive about how things are. So, we still battle that.

Approaches to teaching entail the methods used by instructors to promote learning, and the receptiveness of the learner based on personal interest and experience. Combined with the means of instruction and learning are attitudes and preconceptions each individual brings to the classroom. In the case of this research, the instructors are doing more than planning a program and delivering the curriculum; they are attempting to reach students who have reservations about school in general. On the nature of his students, John said:

> One thing I notice is you get a lot of people here who are not really comfortable in school. Anything that feels like traditional schooling is not what they really consider their strong suit. And depending on how old they are and how bad their experiences have been they have a bit of a chip on their shoulder about any kind of learning. So, the classroom stuff can be interesting. There are some that still have the high school mindset and will sit through some lectures but there are some that are different, you have to get through some barriers. Some don't think they can do math for instance. The math we do in here is very straightforward, but you still have to do it all the time. I feel sometimes like I really should have more like a psychology degree. I know the subject matter well enough and I'm pretty decent one-on-one getting someone to understand. But when it comes to all the stuff you'd probably learn going to school to be a teacher, those kinds of things are challenging, especially with most of the students being people who would not consider themselves to be good students.

A predominant method of teaching at the technical college is kinesthetic with a practical, hands-on approach geared towards student motivation and interest. Coupled with the notion that the students are not largely agreeable to traditional read and lecture learning structures, John explains his approach to teaching:

> It's a hands-on field. The classroom we use as begrudgingly as we have to basically. The goal is to keep them in (the shop) because they need to be comfortable there. If you don't know what you are doing it is intimidating. So, we try as hard as we can to push them in there constantly. They probably spend seven hours in the classroom in the second year; seven or eight hours a week, and

> they are here for thirty hours a week. The rest of the time they are (in the shop).

John employs an authentic nature of learning in not just building skills, but in facilitating motivation in his students by helping them see a direct relationship between what they are learning and how it will be useful in their trade. John goes on the describe the focus of his teaching based on how he understands his students:

> A lot of the stuff we do has to be student-centered. I mean, you're not going to just deliver material and grade tests in this kind of environment. They're not going to get it. Even if they could do the homework they're not going to get it like they do when you cut them loose.

There is a quick progression from a teacher focused setting to student centered learning, and to autonomous learning with guided instruction. John recognizes his students will learn most effectively in practicing and problem-solving, with trial, error, critical thought, and success in the shop. Regarding teaching problem-solving skills John added:

> Sometimes it's intentional. It's built in. You're going to have problems, but it takes the edge off me and the student to not have everything defined perfectly, because they actually have to struggle through and figure it out, which they'll have to do their entire career.

The shop is practice for their career, but it is also a safe place where the learners can test their skills and respond to problems with John's guidance. The students also help each other, as Derek mentions, in mentoring amongst peers and cohorts. All of the instructors emphasized problem-solving and critical thinking skills as necessary for the trades. Due to current and expected advances in technology, a lack of critical thinking ability could make an employee obsolete. There is a strong sense that the students must continue to learn and apply their skills to ever changing situations in the workforce.

As a known element of transformative learning, the ability to think critically was pointedly asked in the interviews with the instructors. Critical self-reflection may inspire transformation, but prior to that the students must learn to think and problem-solve as a precursor to reflective practice. The direct purpose of critical thinking in PTE is to solve problems. Learning the tools of the trade can

be intellectually laborious, especially for those without a background in math and physics. In the case of an automobile that will not start, for example, the students must then use these tools to conceptualize what might be wrong with the car. They methodologically work through a logical step-by-step multi-level process for determining the possible malfunctions, then must decide the order or testing, and know how to perform repairs. Teaching the students how to think critically and reflectively is intentional. Dave said:

> It is not specifically called out as 'teaching them to think', but if we see the opportunity we go after it. It's hard to formalize that or document it, because every person is so different. When we see a weak point where someone is not able to think, there are a million different strategies we can employ. (The students) have to analyze, they have to articulate their thought processes, because at the end of the day they are selling that to a customer. As we go through the program we naturally have the more complex topics at the back end. So that's where we see that higher level of critical thinking take place, but I would be remiss if I didn't say it's from day one, when they walk in the door.

Dave practices reflection in action (Schon 1991) when he recognizes a student struggling with a concept and is able to back them up to a comfortable place and guide them forward. This is a high teaching skill and evidence of the quality of education present in the case study college. Dave does not simply provide the answer to temporarily satisfy an objective, nor does he leave the student frustrated. He assists them with the thought process aimed at solving the problem themselves, so they have critical thinking skills that can be transferred to new situations.

Like Dave, Travis works with students who are struggling not by providing the answer, but by relating to something they *do* understand and thinking it through from there:

> I see differences after the first quarter in the way they approach problems. For example, a student will come in after their assigned reading from the night before and say I don't really get this. I always ask them, 'ok, well show me what did make sense'. I'm not just going to give them whole-sale answers. Often times I find they understood more than they give themselves credit for, but because they couldn't see the whole picture, they just give up. That is a learned helplessness, coming from a lecture environment. If they didn't get the whole thing, they are just kind of waiting for someone else to fill in the pieces for them. I want them to understand largely in life, people are not going to do that

> for you. You have to be proactive – it's your life, it's your education, it's your career.

Both Travis and Dave actively reflect in the classroom and react to the students' needs, often coaching them through a problem as much as they instruct. The learned helplessness Travis mentioned is due to the student's history of lectures, without any dialogue or critical thought, that essentially fed them information needed to pass the class. How successful the student is after a strictly lecture environment depends on how good they are at taking notes and remembering the material. At the PTC, the principles cannot just be memorized, they must be physically applied, which requires a deeper understanding in order to do well. This opportunity for deeper learning is also enhanced by the learning environment. In a study of college students, Tekkol and Demirel recommend:

> Instructional environments should be designed in a way to improve students' self-control skills and these environments should include the use of reflective journals, learning performance evaluation scales and cognitive and/or upper-cognitive learning strategies (2018:11).

Travis, after realizing his lectures were excusing the students from reading and learning on their own, uses the Socratic method in a form of the inverted classroom. His students prepare in advance for class, where they can learn at their own pace from online materials Travis created. The class time is then focused on learning instead of teaching; used for engaging discussions and collaborative problem solving (Hall 2013:np). His methods are not widely popular due to the amount of work, but the results show improvement over straight instructor lecture.

> I still see some student complaints, but not as much because we take a full day to explain it. We show how test scores have changed, and one of the amazing things was the standard deviation on our test scores was cut in half. So instead of haves and have-nots everyone is kind of the same page. It enables students to learn at their own respective pace. That's one of the frustrations as a lecturer; you never meet all the student's needs. One speed in a lecture. It's impossible (Travis).

Travis found that the Socratic method and inverted classroom are more work for him as well:

> In a Socratic discussion environment where students are coming to me saying 'here's what I learned, here's what doesn't make sense', I have to be alert, I have to be paying attention to their misconceptions, listening carefully to their questions, offering advice where I can, listening to their response. It's work. It's a lot more work than delivering a lecture, but to me, that's the work I'd rather be doing.

Travis regarded this as being core to his work as a teacher: his aim 'is to help people think and learn, to be a coach for thinking.' Jack called the lecturer the 'sage on the stage', with a chuckle. He shared a story of going to a presentation and hearing the presenter say they typically take eight hours to deliver their message, but today they only have two hours, so they are going to go fast. This, to Jack, is disrespectful to the audience and the content of presentation in lacking engagement and deep learning. He went on to say:

> We often teach the way we've been taught, and that's a hard mold to break out of. I enjoy a good lecture, but I can also see when I look out to the audience and minds are wandering. To be engaged and learn, that's what excites me. But it takes continuous study. Now we have a different generation and they've all got… (looking for something). Where's mine at… huh, I've lost my phone (laughter). They've got that thing in front of them. So, you mentioned something they can look it up, and you've missed them. How do you keep them all engaged?

In addition to non-lecture classroom environments, many of the instructors are using technology to aid learning. John utilized an online learning program the students can access anytime to learn at their own pace. Time with the students then is spent in practice and application. Regular knowledge checks alert him to when students are not understanding a concept, and in response to this, he will schedule a lecture. But even these are communicated through a college calendar, so students can choose how to use their time that day.

Dave's classroom is set up in a 'U' shape and he avoids lecture instead using the space in the middle of the tables for demonstrations. Every student has an iPad and he employs online programs.

> I try to leverage as many engaging tools online as I can. I do a poll-everywhere every morning. It's an on the fly test or survey site. I'll have two or three questions from the day before and send them to their iPad. They answer, and it populates into a word cloud anonymously. We can see where we are at as a class and there are days where everybody got it and we move on, and there are days

> when 75% of the class did not get it and 25% is going how did they not get that and I go well that's a darn good question, how did they not get that, then I go quiet and let them figure it out.

Blogs are a requirement in Jack and Simon's classes as a means for students to record their learnings and reflect on their progress over the courses. Both instructors use the blogs to ensure student understanding. Jack is 'adamant that the students need to read and write', One of Jack's students had recently thanked him for the blogs after showing it to a potential employer. He said, 'thanks for those blogs, I got a job because I was able to show I had attention to detail and I'm able to write about what I've done'. Simon knows his students are also showing their blogs to prospective employers and noted 'the industry is so happy to have evidence rather than just what kind of grades they got'.

In addition to technology in the classroom, the skilled trades are highly technological and ever-evolving fields, thus the need for keen problem-solving skills. The instructors recognize this and are teaching for future careers.

> The technology changes. There are amazing changes as we speak. I'm trying to show the students that the job today is going to be much different than the job ten years from now. If you build a platform of being able to learn how to learn, and be able to think, and troubleshoot, and apply principles of failure analysis in your personal learning, you will be invaluable. Whereas if you don't do those things, not so much. You have to continue to move along.

The aim in developing an astuteness is job oriented. Every approach to teaching and each method employed is meant to facilitate the student's ability to gain and maintain a successful, long-term career. Each course, broken down into seven-hour school days of classroom-to-shop, theory-to-practice, school-to-internship supports the transition into the workforce. Simon said:

> We teach the student the academic practice and industry practice, we teach both. Everything is to-the-practical. Our mission is to train the student to go to the industry and work. We are proving that. We are bridging the technical stuff, creating something, developing the skillset to find a job.

The teaching approaches aimed towards kinesthetic learning supported by theory, in a safe supportive environment, designed to develop not only the need to complete an immediate task but also the critical thinking skills to be applied

in yet-unknown scenarios demonstrate the quality instruction by people who clearly care about their students' futures.

6.2.2. Care

A caring practice is desired from teachers as they set an example for their students and have means for an ethical influence on their pupils. 'Teachers help students enhance their moral competency by nurturing the character of the students' (Gholami and Tirri 2012:2). The 'caring teacher as moral educator' (Nguyen 2016:290) is one aspect of wanting teachers to care, the other is demonstrating caring as good educational practice. Nguyen argues: 'we want teachers to take care-about their students because we want the students to have a meaningful education' (2016:293). As mediums for delivering an education purposed with developing individuals into benevolent, critically aware, productive members of society, caring for both the student and their learning establishes a safer, more effective learning environment. Such an environment encourages learning and holds the potential for transformative relationships to develop.

Caring can be demonstrated in many ways, and the instructors provided examples of how they care for their students. Without being directly asked in the interviews, stories of caring emerged strongly during throughout the thematic analysis. Recognizing the students are adult learners with families and responsibilities outside of the classroom, and making accommodations for that, is one way the instructors show they care.

> One of my students came to me yesterday and said, 'Jack, is Thursday going to be important?' I said, 'well, we've got some things we're going to do, but I'm hearing that maybe you've got something else going on.' He said, 'yeah, well at my work I need to have 80 hours by the end of the month to keep my insurance current for me and my family. I told him to go to work, we'll take care of class later (Jack).

Travis also maintains an awareness of the whole individual, and that there is more to their life than his class. This shows he cares about them holistically, and that they succeed in their careers with more than the technical skills learned in his class. He said:

> We need to keep in mind that there are layers of things that students need to learn that span multiple curricula and programs.

> For example, say I'm teaching (a specific technical skill) that's deep but it's fairly narrow. If I just kept my teaching to that, I'd be doing my students a disservice. You might know this skill, but if you can't deal with incomplete information do you just throw up your hands and say, 'nope, can't do it?' If I turned them loose in the job market with that limited skill many are going to fail. I've talked to other faculty members who say we can't influence a person's attitude, or their perspective on life. But I think we can, and I think we have an obligation to do that.

Again, the instructors aim for the prospective futures of the trades and were concerned with the students' needs for success beyond the classroom. Travis addressed the whole individual and took his role as instructor and role model as a duty for his students' advantage. While Jack was flexible with his student's need to work for medical benefits, Travis demonstrated that sometimes there is need to be firm. In order to know what is appropriate in each situation, staff and students must have a trusting relationship. Travis said:

> If someone tries to give excuses, you can't let that slide. You don't have to be onerous about it. Sometimes I feel like a surrogate parent. One of my students came up to a hard deadline and actually suffered a reduction of their grade for not having their tool list done. You could say, 'well it's just a tool list, is this really influential?' And my answer to that is, it's a deadline. It's part of professionalism.

Travis cares for more than the student's success in his program, he cares for the individual's career and who they are as a person. Jack pointedly said, 'I show them that I'm interested in their future'. They are teaching beyond the classroom and shop; they are teaching for transformation. Simon was excited for his student's success and the reward they get for their hard work. He said with a smile, 'The first year is a lot of the basics, the second year is SHINE! I'm really proud of them, very proud'. This holistic support is felt by the students and makes a difference in their success. One of Dave's students, Mitch, said:

> Dave's just so into this program and loves what he does. I know he could be making a ton more money in the industry. He has so much knowledge, but he is here because he cares about people going somewhere with their lives.

Mitch became a father during his first year in the program, and also required medical treatments for injuries suffered. He was grateful to his instructors for

working with him on assignments and helping him keep up with his courses even while away:

> Looking back, I didn't realize how big it was, and what all was happening. They were very accommodating, not just accommodating, but understanding. I wasn't excused from everything. But they could see my drive and desire and they met that with expectations I could reach. When I had my kid and my surgery, we were doing pretty heavy-duty stuff in the lab and I was out there on crutches. I was slipping, and my friends were catching me, but I wanted to be there, and I wanted to do it. When they see that, when they know that you're not just here to get a grade, they really help you out. When I was down, I asked Dave to help me out, send me things, I don't want to miss anything. He would send me quizzes, different materials, videos I should watch. I don't think I ever felt behind in the class. Having to miss a couple days, they would work with the schedule a bit. They would pull up a chair for me in the shop and make sure I was doing ok. Even when I came in a little late because of taking care of my kid, they understood. You know they aren't just measuring it like, you have to do these 5 assignments and if you don't do it you fail, but it matters if you want to be here and want to learn, it's not just for a degree but for some knowledge, they meet that with the same enthusiasm. They meet you where you are at. That's why I've been able to survive here; not just survive but do great. I've never had this feeling before. I'm not just breaking my back and not seeing anything for it. They don't just say oh you missed three days so too bad for you. I continue to work hard, and I see results. I see things happening in my life.

The connection and understanding in the teacher-student relationship relayed in the interviews and apparent throughout the analysis was impressive. Time and again indications of caring behavior surfaced. In the above quote, it stands out that Mitch has not always enjoyed care and support in his education when he mentions the idea of missing school leading to failure or abandonment. His work and his life are recognized, accepted, and accommodated to ensure he still has the opportunity to learn. Recognizing that he went to high school for two years and also attended a community college, it is worth quoting Mitch again when he said 'I've never had this feeling before' as attestation to the attention and support afforded him at the case study college. Mitch and his education matter to his instructor.

The instructors explicitly demonstrate caring towards their students. They also create conditions for dialogue and the development for student caring relationship within the cohort model. Jack has barbeques for his class in order to

get to know his students better, and he visits all of the internship sites to ensure his students are working in safe conditions. Jack stated:

> I'm always concerned for the safety of my students on internships, so I visit those internships. I'm very adamant about that. The administration would like me to pass that off to somebody they didn't have to pay so much that knows nothing about what the students are reporting. I want to see where they are at. I want to talk to the owners, foremen, superintendent, whoever it is. I want to talk to that person in charge and see the conditions they are working in and know there is some semblance of safety because I've pulled people out if it's an unsafe situation.

Jack's demonstrations of caring for his students and showing them that he values their safety, create an environment of trust. The time they spend together in activities like barbeques provide further opportunities to know each other, and to learn perspectives and mindsets other than their own. Establishing that people care enhances the trust and openness to in-depth discussions that may precede transformation when a dilemma is presented. If, when met with a dilemma, our choices are to consider other options or reject it entirely (Cranton 2016), we are more likely to grow from situations with people with whom we trust and feel safe.

6.2.3. Cohort Model

The programs of the case study school are structured in cohorts. They began with 24 students who are together through both years. Two cohorts run at the same time; one first-year and one second-year group. There are only one or two instructors for each of the participant programs, so much of the time in the labs or shops is self-directed. It is also in the lab that the cohorts might mingle. The amount of time these 24 individuals spend together is significant. The school day runs seven hours from 8:00am to 3:00pm, and many stay late to work in the labs together.

The cohort model creates the opportunity for the students to know each other well, build trust, and engage in meaningful conversations. This element surfaced through the interviews as a key factor in relationships in education. Dr Phillips noted that:

> This college is much more cohort based than I imagine other colleges are, particularly in the physical sciences. Health care is a cohort model wherever you are, but welding is typically not.

> Process technology, mechatronics, all those tend to be open entry open exit programs in other school, but here they are cohorts without a lot of entry points.

Cohort programs and cohort learning describe an educational structure whereby a group of students enter the program at the same time and stay together throughout the duration, taking all their classes sequentially (Rausch and Crawford 2012). There are typically fixed entry and exit points. If the program begins in the fall and proceeds in quarters, an individual cannot enter the cohort during the winter or spring terms. They would need to wait for enrollment with a new cohort at the beginning of the program class sequence. Travis explains:

> The way we do things here is different from many other colleges. At many colleges you can take a buffet of classes. Here, because so many of the courses are dedicated to a particular program and it's on a regimented schedule, students spend time in cohorts. They come in, and they graduate with that same group of people. They spend a lot of time with that same group. They may start off in segregated pods, but they eventually mingle. It's cool to see when the younger kids start having conversations with the older people. And it's neat to see the adults mix with these young kids. It reminds them of life back when they were that age and freshens their perspective. It's interesting to see adults who come in, for lack of a better word, 'stiff' with their comfort level, then after a couple quarters they loosen up, they're joking with the kids, their hurtling friendly insults back and forth. It's neat to see that in play, I think we need more of that.

Travis noted how the cohort structure allows the students to become more comfortable with their peers regardless of age and creates generational learning opportunities. From a student perspective, Wes, the oldest student participant, had the same notion:

> From when I first started, we've all gotten along great. I respect younger people too. I don't know it all and I'm not always right. There are many ways to (get things done). I can just share what's in my head, that's all I know.

Another student, Derek, stated: 'You get to know these people going through the same struggles, with some of us getting it and some not'. A benefit of the cohort learning model is the sense of community that can develop among the students. Rausch and Crawford (2012:178) argue that higher education 'has consistently viewed community as essential to support collaborative learning and discourse associated with higher levels of learning'. This sense of community

creates the opportunity for a safe and critical learning space, encourages reflective practice, and better engages the student towards program completion (de Lange, Pillay, and Chikoko 2011).

The relationships forged within the cohort help keep the students accountable to each other. When asked if the cohort model contributed to the college's completion rate, Dr. Phillips replied:

> I think that has everything to do with the cohort model. We know that faculty are the number one influence on students to stay in school, if the faculty member is not just good, technical-wise and teaching-wise, but actually cares about their students, the students are more apt to stay in school. The cohort model lends itself to people knowing each other better.

In a study comparing an online cohort to a face-to-face non-cohort in the same program, Alman, Frey, and Tomer (2012) found the cohort students were more satisfied with the program and tended to be more successful due to the sense of community and increased interest in discussions amongst their peers. De Lange, Pillay, and Chikoko (2011) found the students in a cohort felt a sense of belonging and trust that empowered them to take risks in their learning communities.

The cohort model is also an effective means for teaching critical reflective thought in theory-to-practice in the skilled trades. Saltiel and Russo state:

> Most cohort-based programs are designed to use group dynamic processes that require reflective opportunities to integrate theory, practice, and thinking. Learners gain much from the group and individual time to think about, discuss, and analyze the relationships between theory and practice (2001:18).

Cohorts in education improve the opportunity for relationships which may enhance the transformative process as the students are more able to develop mutual trust and receive support (Merriam et al. 2007). Saltiel and Russo state that within the cohort model 'learners will develop higher levels of cohesiveness in the strong supportive atmosphere' (2001:55).

However, relationships and group dynamics within a cohort can be positive or negative. Unfortunately, cohort learning does not always result in a cohesive community of learners who remain friends well beyond graduation. Scribner and

Donaldson conducted a study on 'how the group dynamics within one cohort facilitate or impede learning' (2001:606). They studied how cohort members were able to resolve tension, interpersonal interaction and communication, and found a range of results from non-learning to transformative learning. Scribner and Donaldson conclude that the 'nature of learning within the cohort was dependent on aspects of group dynamics' (2001:629). This was something that Dave commented on: 'Some groups are very social, extroverted… you just get that group. And other times you have students where you're just wondering how this group came together. They don't talk, they are not friendly.'

Cohorts limiting the number of students in the program by having fewer entry points. The case study college is an example of this. Having only one start date per cohort, and only one new cohort per year, means that if an individual misses the application deadline, they have to wait another year to enroll. Also, attrition negatively affects tuition revenue since students who leave are not replaced. But largely, the students benefit from the trust that is built over time and the ability to more easily work together with people they have come to know well. On how the students interact, John said:

> It's not super formal because they are locked together in here for two years. If you are going to spend 30 hours a week with the same people, you are going to work together. Very rarely is there someone who is completely alone. They are going to collaborate.

Dave added:

> There are certain cohorts where I don't need to force the teamwork because they just work in teams. I don't know why. They are just good. When there is a challenge or an assignment, they just work together. Wonderful. Learning from a peer is 100% better.

A sense of family and camaraderie matures based on the amount of time they spend together, on the common ground of education. John suggests they are stuck together regardless of their initial impressions, but they often do more than tolerate each other. The time spent in the cohort enables the students to relax with each other and establish trust. Travis said:

> Trust is not automatic. There is a certain getting to know each other period that has to take place and our cohort model gives us the time to do that.

The relationships built on time and trust, enabled due to the cohort structure, made a lasting impression on the participants. The cohort provides space to become comfortable with classmates and learn to respect them. In doing this, the students become open to hearing and respecting each other's opinions. Seeds of transformation come in the moments of respect for a mindset different than one's own. The cohort does not just bring people together socially, the relationships also keep them together and provide support for completing the program. Mitch considers his cohort as his team, including the people he might not be friends with otherwise. The ability to know the people you are studying with well enough to trust them, rely on them, and learn with them is a powerful element in the college, and in creating transformative opportunity. Mitch said:

> I've grown to understand you rely on other people. Even if you don't get along with them, they are part of your team. You know them, you know their strengths and weaknesses and you work together well. When I first came here I thought there was nobody I really clicked with. Now these are people that I'm going to be friends with for the rest of my life. They are closer than friends, you know? Really good people. And you realize you have a pretty close dynamic. You just connect, and you can focus on what you are learning. I feel like there is this peer pressure or something when you are constantly going into classes with new people. Like when some people go into classes with people they don't know and have to prove themselves or try to be cool. Whereas here everybody knows each other. We know the people who always show up late, and we always give them a hard time, and they are our good friends. We know the people who always work really hard and we give them credit and so this dynamic – even if it's not a special thing we have, it's still very important to have. You belong, feel like you belong, whether they are your best friends or not.

The students come into the program from variety of backgrounds, and with a myriad of potentially disparate experiences, but they have the trade and time in common upon which to build allied ground. The cohort is a strong driver for successful learning by creating opportunity for the students and instructors to know and accept each other regardless of initial differences. It satisfies an emotional need for security and the sense that the student has a place in education.

6.2.4. Belonging

Teaching approaches, caring, and the cohort model are important to creating healthy educational relationships. The students come from a variety of backgrounds, yet all benefit from feeling like they belong. Terrell Strayhorn, describing a study of first year college students, states:

> A sense of belonging [is] a basic human need and motivation, sufficient to influence behavior. In college, it refers to students' perceived social support on campus, a feeling or sensation of connectedness, the experience of mattering or feeling cared about, accepted, respected, valued by, and important to the group or others on campus (2012:55).

The sense of belonging stems from the relationships fostered in the education setting. It is important to successful learning as it relates to the feeling of safety and the space to be able to take risks, accept challenges, and make mistakes within the comfort and guidance of the learning environment. Several of the participants did not feel like they belonged in high school yet found a college of which they are a part. Derek and Mitch both fought in high school and dropped out, but were excelling towards graduation at the PTC while mentoring peers. Rich acted as the class clown at his high school, but united with peers for projects and employed his 'no man left behind' attitude. Travis stated he 'despised high school' and didn't fit in, but now leads a very successful program enhanced by how much he respects his students and colleagues. The methods and program structure have enriched the team framework for learning.

Derek, in his second year, shared some thoughts about mentoring the first-year cohort:

> I talk to quite a few of them, and I guess you could say we are trying to prepare them (for the second year). I want to make sure they understand it does it harder, but it gets better. They are doing the hard stuff right now, the stuff that makes you want to give up. From there it gets harder in a different way.

He went on to tell of how he influenced a classmate:

> Roger just got a job, and he said if it wasn't for me he wouldn't have made it. I took the time to do my work and help him understand his. You know, it probably hurt my grade, but I'd much rather help someone.

Having experienced the struggles of the first year, Derek encouraged and motivated the next cohort. This was clearly a selfless and group-oriented behavior, keen to a learning environment, not based on competition or performance. Derek's contribution to the group helped create a space that is safe. This creates opportunity for students to challenge themselves and take risks. Derek draws peers into the space and gives them a sense of belonging and support:

> I try to help (the younger students) understand they are going to make mistakes, and to not be afraid to make mistakes because that's how you learn. There are a couple guys that were very quiet. One of them, when I met him, you couldn't even get him to say 'hi'. So, I gave him a nickname and every morning said hi, and eventually he came out of his shell. Now he talks. He asked me why I always said hi to him. And I'm like 'dude, you are going to be out in the real world and working with people – you've got to get used to this, you are going to do things that make you feel awkward, but it's part of life, so get ready for it'. Those guys… I hope I helped them.

Besides mentoring, it's notable that Derek was showing an astute awareness of successful learning by understanding the results of failure in a safe learning environment. He reassured his peers, instilled their sense of belonging, and bolstered their hope of success. A well fostered trusting relationship in education can eclipse fears (Cranton and Wright 2008) and empower students to dive deeper in their learning.

The sense of solidarity and belonging allows the individual greater emotional freedoms to learn, without having to mentally navigate pressures, issues with confidence, and the imposter syndrome that interferes with learning. Imposter syndrome refers to people doubting their selves and having a fear of being exposed as a fraud, feeling like they do not belong (Dalla-Camina 2018). Pinto-Powell (2018), an advising dean at a medical school, has seen the self-doubt prevalent in students. She reported that, 'trainees suffering from impostor syndrome not only often struggle in their academic classes but can become socially isolated' (2018:np). Anna Parkman, in her 2016 research on 'The Imposter Phenomenon in higher Education' recommends programs for students addressing the sense of belonging and gaining support. The instructors and students provide the sense of belonging engaging one on one and caring for each

other. This in turn enables the students to open up to one another, creating an avenue for a shift in perspective.

Mitch relayed a visit he had with a classmate one night. Based on their time together, he has become friends with many of his classmates and had the opportunity to gain their trust and learn about their lives outside of the classroom. Mitch said:

> I was hanging out last night after class until midnight and he was just telling me his life story. It's unbelievable the things people go through, not being able to get an education. He was born here then had to go back to (another country). He couldn't get an education and started working when he was nine or ten – and that's it. Being here, people don't understand what they have. He's all in (at the PTC), and it changed his life. Another one of my really good buddies now spent all this time in the middle east as a contractor, he came to this class and just loves it here. It has completely changed his life too. Another guy was a chronic alcoholic and it has changed him too. You'd never know, they are just the nicest guys in the world. But having the opportunity to get to know these people on other levels because we are together for two years - you get to see how much everyone has gone through and how this program has changed us.

Mitch went on to say how these friendships grow even when there are personal characteristics amongst the cohort that don't harmonize right away:

> We have different opinions on stuff. Some guys obviously, if you put them in a closed space for a long time they are always going to end up bickering. But in general, we are a really close-knit group and literally I can pick anyone from the class to go have a drink or a good conversation with. The first fall I saw a lot more of the butting heads. Now we're just over it.

Acknowledging differences while still respecting each other is a strong precursor for considering meaning schemes that do not initially fit in one's point of view (Mezirow 1985, Cranton 2016). Mitch is considering the lives and attitudes of his classmates and taking a fresh look at himself. Rick has a 'no man left behind' mentality that he says he developed in the military. His mindset and ability to mentor his peers serves to keep his cohort together and maintain a diverse set of perspectives. The variety of opinions and mindsets are seeds for transformation. Rick shared:

> You are always training someone to replace you, because one day you might not be able to come to work. Maybe you're sick, or

> maybe we lost you. So, in the military we always have the mentality of training the person beside you, because you never know when you are going to need to depend on that person. Any time I tutor the other students, I tell them they have success in the numbers. However well you understand it, you'll have more success in a group. Everyone else may see it a different way and give you a different perspective. So, you get to see it two different ways. Someone else can bring it to light.

The relationships fostered in the PTC enabled a sense of belonging in the participants, through which, they were empowered to learn without fear of failure, secure in the belief that they fit in, and can be successful. These relationships supported and strengthened by the teaching approaches, demonstrations of caring, and the program cohort model structure facilitate the opportunity for transformation because they establish trust between the parties. Cranton and Wright, in their 2008 research on 'The transformative educator as learning companion', wrote:

> People were listened to, respected, trusted, and heard. It was then that they could see the possibility that they could hold a different point of view, that they could learn, that that they could change as a person. It seems it was not so much the event itself but rather the relationship they developed with the educator that created the potential for transformation (2008:44).

The relationships also fuel motivation. Derek, Dave, and Travis were great examples of people encouraging and believing in others, pushing others to succeed in way they might not have been able to without an authentic relationship. In this way, the relationships aid the satisfaction and reward that comes from accomplishment.

6.3. Global Theme: Satisfaction/Reward

The third global theme describes the sense of satisfaction and reward that can come from learning, and the knowledge of a better future in applying an education in the work force. From the moments in the classroom when a concept finally 'clicks', to the sense of accomplishment at graduation, to the security of a fruitful career, these occasions of achievement are a gear in the cycle of transformation. They motivate and stretch mindsets to fit one's growth and new perspective of self.

This theme is supported by two strong subthemes that emerged from the analysis; ‘a-ha’ moments in the classroom, and the dawning of a new impression of oneself as a result of learning. The a-ha moments are not always abrupt. Sometimes it’s not until the end of a class that the student realizes something they struggled with is now easily understood, but they are profound in the sense that they demonstrate the individual’s growth. Self-reflection occurs upon realizing a change in oneself and one’s capabilities. The process and completion of the professional technical program awards this to the participants. These moments, big and small, are potential seeds for transformation. It shows that work, sacrifice, and struggle, both in and out of the classroom is worth it, and often gives cause for reflection. These moments are not the end, they fuel self-motivation and continue the cycle. Interestingly, tangible rewards are very apparent in PTC because students are so often building and producing with their hands: they can see the fruits of their study. It is also worth noting the scope of achievement for a graduate that did not consider themselves a good student. These moments can change the individual, transform them, and encourage a broader mindset.

Mark recognizes the value in his theory-to-practice education and the results garnered. He said:

> You are rewarded here with the result of what you’ve made or fixed. I’m not trying to downplay it, but if I was in engineering taking 5 or 6 years, I could do all this math, but I couldn’t like, produce something. Well, now I can go home and make something.

The PTC learning is immediately hands-on, with the bulk of each day spent in the lab practicing the trade, working through problems. The kinesthetic application serves to reinforce the learning, and significantly increasing the transfer of learning (Daffron and North 2011). The focus on kinesthetic learning, facilitates the satisfaction and reward earned through the direct application of theory.

6.3.1. A-ha moments

> Watching students learn and seeing the lightbulb go on is the fix. That’s what we’re after (Jack).

The instructors repeatedly talked about instances when the students understood a concept or theory. Referred to as ‘a-ha moments’, it describes an awakening

or realization of a concept mentally clicking into place. At these moments the student is aware that their thinking has been stretched to fit new information. The same growth and assimilation of new information happens when people expand their thinking and adjust their mindsets in transformative learning.

The instructors witness these moments. They facilitate them by letting the student think about a problem and coach them through to resolution. These moments are the result of successful problem solving and the habit of critical thinking. John had a student who struggled in the first year of courses and almost did not pass to the second year:

> You never know when it's going to happen. One example was a running start student; he was young, like sixteen or so. One thing you notice is, generally speaking, the people who have had a job have better problem-solving skills. So, this kid didn't have any problem-solving skills whatsoever, and by the end of the first year he barely limped into the second year. But in the second year something clicked, and he just got into it. By the end, he'd taken his learning and his ability into one of the highest levels of anybody here. Now he has his own business and one of the new students here actually helps him out once in a while.

Dave, knowing how the learning will progress and anticipating future moments of reward through problem-solving, shared:

> Right from the beginning I throw some diagrams at them and they struggle with the simplest thing. The end of the quarter is next Friday and I'm going to show them that same diagram that they were just baffled by, and they're just going to be blown away. They do the same thing every year. 'You're kidding me that's the same diagram?' So, you can see the evolution happen, but some students – they almost flip a switch and suddenly they are able to dramatically increase their ability to critically think around many situations.

Speaking of the first-year students, Dave went on to say:

> Next quarter they'll be through the safety and introduction and a lot of them have never really turned a wrench before. We call it 'turning a wrench'. They've never worked with metal, nuts and bolts and things. So, I will see multiple lightbulbs coming on next quarter. It's also because they are engaged. They are not only engaged in their learning, but they are actually physically applying their knowledge. Something they don't have enough practice of in actual life. So, we go over some theory, and then actually apply it in the lab.

Dave and John are describing the development in learning between the classroom and the shop, and the dramatically increased potential in learning transfer due to the real-time application of their new skills. When Dave presents the same diagram at the beginning and end of the program, he is giving them opportunity to reflect and understand how much they have learned. Travis's a-ha moment was when he suddenly realized it was the thoroughness of his lectures that was resulting in lack of retention in his students. After speaking with colleagues and 'lamenting' about his students not retaining the information he presented, it was suggested he visit the nursing program on campus to observe their classroom activity. This is when Travis learned of the flipped classroom model:

> I scheduled a few days where I could just go over there and observe, be a fly on the wall. It blew me away. Everything I was trying to achieve, and was not achieving, I could see happening there. I could see deep engagement, I could see actual lightbulbs coming on when things were realized, and I was like 'wow, this is cool'.

Travis then embarked on his own transformative process as an instructor, practicing reflection and critical thinking to better serve his students in the long term.

As discussed previously, the rapid technological advances in the skilled trades warrant an education that provides a foundation and critical thinking skills in order to build a successful career. The students experienced the growth mindset from active learning and reflected on how far they have come in the program. Derek said:

> I'm just standing there and all of a sudden, it's like 'whoa!'… but it's every day. A bit every day. That's where I'm at now – you know it gets harder, but in a different way. I look back at what the first-year people are doing and think it's so easy, but it wasn't then.

Being able to put the learnings to practice in the shop enhances transfer. The instructors continuously learn about educating and put it to practice with the students, just as the students learn about the trade and put it to practice in the labs. Both the instructors and students experience the satisfaction gained in this process and realize a new purpose for their learning and careers. Travis witnessed his students' growth in the two-year program in terms of how they

learned to recognize their own gaps in the material and endeavored to bridge that gap:

> I see changes in how they approach things – not just ethics or professionalism, but cognitive ability in the way they approach problems. Maybe in the first quarter they are not understanding a reading assignment and they just give up. Later on, you don't see that. They'll be more specific about what they don't understand, and they may even propose their own fledgling explanation for it. So, they are developing metacognition, the ability to tell not only here's what I know, but here's the degree of confidence I have about what I know. That's a really important skill especially when we are constantly dealing with incomplete information. And you see that happen here. It's really rewarding to see that transformation.

The moments of realizing educational growth, whether abrupt or gradual, expanded mindsets and provided reflective opportunities for the participants. This experience coaches the individual for transformation by exercising the mind to assimilate new information and new perspectives of oneself. Additionally, the skills the students are learning empower them by providing them a resource towards an engaging livelihood: they find purpose in their skill.

6.3.2. Purpose

Having a goal or purpose for striving is motivational. The importance of purpose as a sub-theme to satisfaction and reward is twofold. It underpins the intrinsic motivation that keeps the transformation cycle turning, and it demonstrates the development through self-reflection that the participants braved in coming to understand how they value learning and future opportunities as a result. Rick provides an example of self-reflection in learning, growing from a state of not having a purpose to finding one:

> When you get out of high school, you don't really know what you want to do. I really appreciate that I didn't go to college right out of high school, and my mom says that she wouldn't really have pushed me because she knew my mentality. She wanted me to, but she knew that I wouldn't appreciate it right out of high school as I do now. I would have just been going and having a good time and whatever I get out of it, I get out of it, then go to work. Versus this makes a difference to me because this is what is going to aide me in the next chapter.

Derek shared his thoughts about continuing to learn after he graduates, since the material will still be available. He is driven to know more about his trade:

> When we leave here we have the basics, we know enough to get ourselves in some serious trouble. But what's really cool is even after we graduate we still have the (online instructional software) for a year, and all the information we need is still on there. And for me, that's pretty cool. Not everyone has that option.

He went on to say:

> This (education) makes me feel good because well, I'll be the first person in my family to graduate college. You know I reflect back, and I used to think realistically I'll get my certification and I'll be done. Then I got into it and I wanted to learn more and understand more. At the end of it, it's like… wow.

Both Rick and Derek practiced self-reflection and value their education more than the diploma. They were interested more in the learning and the skills than just satisfying the criteria. This learning-focused attitude allows for growth and self-awareness. Learning in order to sustain a career, Derek is looking forward to enjoying the benefits of his education: 'The industry is really booming. I look forward to doing it for however long it takes me to retire. I'm glad I'm on this path'. His education, and the work he put in to achieve it, has earned him the reward of an engaging, satisfying, transformative career.

Most of the student participants were in a state of uncertainty before entering the PTC; changing jobs, locations, healing from injuries, or retraining. Mark was seeking the skills needed to create his vision project, but the other five were in a blurry state of transition. Derek and Wes had even taken job placement questionnaires prior to enrolling. Each of them near the end of the program had a clear purpose armed with the skills of their trade. Wes fought an illness for years that caused him to leave a previous job and dampened his self-esteem. I asked him if he thought his education was influencing his attitude. He replied:

> Yes. In fact, my goal is to own my own shop. I'd like to have a shop where people can bring in a part or plan for anything and we can build it. Full service – we could build anything. That's what I'd like to do. I'm not limiting myself. I feel confident enough to have my own business even though there are (things) I don't know how to do yet, that's ok.

Wes aimed to own a business and produce goods that he did not yet know who to do himself, but he knew he could learn. This was a significant change from only

two years prior when he entered the program, not having a vision of the future. His education has provided skill and confidence in his ability to learn.

Travis provided another example of a student transformed by education:

> I had a student who, in her first year, was rebellious, disrespectful, immature. The way she carried herself didn't exude any sense of professionalism. She wanted to do some work over the summer and asked me for some ideas. I referred her to a place in town. She goes to work on the assembly line and was getting kind of bored with it. Then someone in the company discovers that she has a year's worth of education in this program. They had an engineer that needed an assistant and asked her if she would you like to do that. When she came back at the end of that summer I literally didn't recognize her. I asked her what made a difference for her, because the change is obvious, and she told me what made the difference is someone respected me for something I knew. She'd never had that before. She may have been respected for what she looked like, she may have been respected for the friends she had, for the way she acted. She came to this environment and those things didn't fit anymore. Then she stepped into a new environment, the work environment and suddenly she got a pay raise for her technical abilities, something she'd never even counted on. That transformed her life. It's pretty cool. I think we have an obligation as educators to create that disruption, to force them to re-evaluate what they've considered important. And I get to see that happen. In that case it was very dramatic; the transformations aren't always dramatic. But they happen often, and they are very rewarding to see.

At the time of our interview Travis was not familiar with Transformative Learning Theory, but he knew well the impact of creating a 'disruption' for his students and challenging them to see things differently. This is a clear example of the instructors actively engaging and practicing superb teaching skills. This behavior is contrary to the stigma alluding to a poor quality of education in the trades. His skill as an instructor allows Travis the reward is seeing his students grow. The student's reward is an improved sense of self. These both demonstrate purposeful education.

In speaking about the program and what it means to the participants, some were motivated by the enthusiasm of others and absorbed this into their approaches to learning. 'I love it here, there are so many intelligent people who are passionate about their trade' (Jason, student). Mitch has learned what he thought would be easy is much more complex, and he is impressed with his instructors' passion for their trade. He said:

> When I came here I started to see there are people who are really passionate about their trade. And it's not the case where anybody can do this. There are plenty of people who can't do it; can't weld or can't cook anything. I met an instructor in the culinary program and he left a good paying job to come here to teach because he is passionate about this. You know Dave; I've never seen anyone more passionate about anything than my instructor is about his program. That guy lives and breathes (his trade). There are people who volunteer to teach night classes because they love it. They want people to know the trade, and have these skills, and it's not just a second-class citizen kind of thing where 'someone's got to do it' you know this is a tough thing to be good at.

Mitch has undergone a transformative process. Roughly ten years prior to our interview he was being expelled from high school and was told technical school could be a last resort for him. His perceptions of PTC and trades work were in line with the stigmatized stereotypes discussed in the literature review. Physical limitations preventing him from what he considered his dream job, a poor attitude, and lack of other options led him to the case study college:

> I was just a dude sitting on the couch thinking life is over. And I've always had kind of a lower view of this college, and technical training and technical college. I thought it was beneath me and would be super easy, so I'll just go do it.

At college he learned his perceptions were wrong, the skilled trades are complex and challenging, and above all, worthwhile. I asked Mitch if the program has been easy, and his response told of a learning transformation:

> It has not (laughing). Yeah, quite the contrary. I have a 4.0 now, which I've never had in my life, but it's not about that, it's about wanting to learn and know the material more than just getting credits. People here are so purposed. When I went to (the community college) there were a lot of people that were just doing college because that's what you do when you didn't want to go to work. They didn't know what they were doing, or if you asked them they said, 'I don't know maybe I'll go to another college next, or work at McDonalds for a few more years, I don't know.' But here every person has a purpose, every person has a direction that they are going. I realized it's not just about getting a grade here, it's more about this being for your own good. If you have a goal the they will help you achieve that. I know guys here that have just had, you know, a tough life. But they are here every single day and they never miss a day and they are always on time and nobody is making them do that. They are just driven on their own. I can just do the assignment, but it's a whole other thing to try to understand it, watching videos, and reading a book about it. I catch myself doing that and it's always weird to me.

Mitch understood the greater purpose of the education and related it to personal benefit for each student. He was affected by the passion and skilled teaching of his instructors. He has practiced self-reflection and opened his mind up to understanding new skills and the histories of his newly made life-long friends. The technical college program inspired a greater appreciation for learning. 'I'm interested just with education in general, wanting to keep learning. I've never valued education before'. Powerful words on transformation are captured in this quote from Mitch:

> This atmosphere and this education really change minds and lives. So, I'm pretty passionate about it. It's pretty awesome. Just experiencing it first hand, it gives you purpose. It gives you direction. Not just the skills for (my craft), but the skills to be able to think and want to learn. I just got excited about knowledge. You know? If I want to know something I read a book now. I just started to eat all this stuff up. It's this mindset I got here, not just specifically for (the craft), but in general. Knowledge is power – it's awesome. Its life changing.

6.4. Summary

The global themes are inter-related. Much of the data supported multiple themes. Transformation may occur through a circular framework and is not always as if the individual is jumping from one stone to the next, rather it is often an ombre slide. Nor is this transformative process linear. The sub-themes form a web around the bi-directional circle of motivation, relationships, and reward. The data reveals explicit actions of sound pedagogical instructional practice present in the PTC, and transformative potential available to the students.

A variety of teaching methods are employed that are recognized to be strategic to transformative learning theory, with an awareness of different learning styles. A progression of factors facilitated within this PTC inspired transformation. The motivation to learn created the opportunity for an intellectual awakening or 'a-ha' moments, which led improvements in confidence and self-esteem, then personal reflection and satisfaction with one's self and the productive work of which they are capable. The relationships built throughout this process opened minds to other view points and further encouraged self-reflection. The cohort model promotes transformation by fostering an environment where students feel like they belong in education, care

and are cared for by their peers and instructors, are developing relationships, and engaging in mentorships.

The primary research question is whether or not transformative teaching and learning practices are present in Professional Technical Education, and from my research findings I can answer, yes. Though the instructors may not have formally studied education or transformative learning specifically, there was an abundance of evidence of transformative practice in the data. They are teaching in ways that may inspire change. I've come to understand transformation may be encouraged by the actions and demonstrations of the instructors, but if and how it manifests in the students is more complex. Over the course of my study, I progressed from the question of whether it is present in PTE, to considering the transformative potential of the PTE for the student. Transformative teaching practices are not the end product, rather they are aimed at causing change for the student.

A circular framework of transformation spins through motivation, relationships, and reward, gaining momentum each time an instructor cares, a peer mentors, or a concept is suddenly understood. The thematic analysis brought to light the quality of instruction present and the potential for transformative learning in the case study college.

Chapter 7: A circular framework of transformation

In this chapter I will discuss the presence of transformative potential in PTE and provide my interpretations based on critical reflection of the specific findings and how they apply to the broader research context. My primary claim is that the potential for transformative learning exists in professional technical education, specifically in the case study college. The instructors demonstrated their own transformative journey from industry to teaching and now, in their classrooms and labs, create opportunities for student transformation. The data indicates a strong sense of resilience and motivation from the students, arising from a range of experiences and circumstances, priming students for self-directed learning. Merriam, Caffarella, and Baumgartner (2007) cite Guglielmino's 1977 work regarding readiness for self-directed learning requiring initiative, persistence, curiosity, and 'a tendency to view problems as challenges rather than obstacles' (2007:121). My findings revealed a strong presence of readiness for self-directed learning that enabled a route to transformation through the tendencies to be curious and resilient. Upon entering the college, the students found themselves in a pedagogic learning environment which encouraged transformative learning.

The key findings from this project, resulting from the literature review and thematic analysis of the interviews, are: verification of a stigma attached to the skilled trades and technical education; the importance of student motivation, transformative practices and critical thought; the cohort effect; and finally, the discovery of a *circular transformation framework* which includes the active elements in creating opportunities for transformation.

My research questions were:

- Are transformative teaching and learning approaches present in PTE?
- If so, is it explicit or implicit?

It was my own disorienting dilemma and subsequent wonderings after witnessing unfavorable attitudes towards my brother, co-workers, and myself working as electricians that led to this research. As I unpacked the history and public perceptions of trades work and schooling, I found two veins behind the perceptions of crafts persons. One is the notion that individuals in the skilled

trades are less intelligent and their jobs are less valuable than those of white-collar work. The other, similarly, is the idea that the desirable tertiary educational path is to a four-year college or university, and to do otherwise is considered inferior. Tying these two together are the actions of people with influence over young secondary education students, directing the academically successful to universities, and others, with less enthusiasm, to trade school. The persistence of the stigma surrounding professional technical education is disheartening, especially given the clear presence of quality higher education instruction at the case study college.

7.1. Discussion of key findings

A discussion of each of the key findings and how they relate to the literature follows, building towards the concept of these elements fueling change within what I call a *circular framework of transformation*. The students, the instructors and the institution all play a part in transformative learning in the PTC.

7.1.1. Stigma of PTE

The findings support the notion that PTE is stigmatized as a poor-quality education for the less intelligent, despite the high demand for skilled trades people, competitive pay, and benefits offered. Marcus and Gross cite a state auditor finding that 'good jobs in the skilled trades are going begging because students are being almost universally steered to bachelor's degrees' (2018:np), recognizing part of the cause is it's reputation. Despite the millions spent across the nation on campaigns to improve the perceptions of CTE, some worry that it will only facilitate tracking in school systems where some students may be 'urged as early as the seventh grade to consider the trades' (Gross and Marcus, 2018: np).

It is deeply disappointing that the stigma surrounding PTE still exists. I found evidence at the case study college of quality higher education in terms of the instructors' expertise in their field, instructional design, and student experience. Higher-order critical thought is being developed through sound instructional techniques in a caring transformative environment. My findings indicate that student participants were aware of the stigma and attended college anyway. The college president, instructors, and student participants know the quality of instruction present in the case study PTE, but there is a

disconnect between their experiences and wider public perceptions. The literature admits the persistence of stigma, and presents economic arguments aimed at the need to change perceptions of vocational education and trade work. However, the attention is on the economic need, when it could also be on the intellectual growth opportunities.

The data gathered in this research, demonstrating a high-quality education provided via potentially transformative teaching methods is hard to reconcile with the literature regarding perceptions of professional technical education. The case study college has the elements of education that may re-write the worn-out story of an undesirable, poorly delivered trade school. The participants are motivated, driven, and confident in their achievements. The results of their work, readily displayed, were remarkably crafted high-tech projects. PTE is not for the intellectually lethargic, disengaged, non-college bound. Though some of the participants did not consider themselves academically inclined, they understood levels of math, theories of physics, and complex machinery that facilitate some of the fundamental pieces of our society. This knowledge and skill certainly indicate that their intellect, value, and expertise has been underestimated.

Helena Korp's (2011) study 'What counts as being smart around here? The performance of smartness and masculinity in vocational upper secondary education' found that even when students were completing high cognitive level skills that were related to their trade, they did not self-identify as 'smart'. Culturally engrained attitudes persisted. She wrote:

> the students at Rockmeadows High tended to dichotomize theoretical and practical knowledge and skills, and to describe themselves as being intelligent 'with practical things' or 'with the hands' rather than theoretically. 'Theoretical intelligence' in contrast, was regarded as exclusively linked to success in academic subjects ('book smarts'). Thus, these students would not conceive of their own ability to perform on high level cognitive levels, for example, in trouble-shooting and renovating engines in their spare time or employing theories from physics in reasoning about the compression brakes of the LGV, as expressions of theoretical skills. The experience of managing such advanced cognitive tasks did not seem to alter their belief that in essence they do not possess theoretical intelligence. As a consequence, their strong identification with being practically and thus not theoretically smart, is likely to prevent them from considering further education." (Korp 2011:65)

The student participants, like the students in Korp's study, considered themselves good with their hands, but not academically strong. The demonstration of putting theory to practice at the level they do, however, is certainly a testament to intelligence. That they, and others like them, have been wrongly labeled otherwise is embarrassing.

Amidst the stigma and lack of guidance, the participants in my study found their way to the case study PTC. Their stories, sometimes influenced by the negative casting of technical education, all resonated with resilience through life events and self-motivation. In the next section I will discuss their desire to improve, what it says about them in light of the stigma on PTE, and how their motivation is key in transformative opportunities.

7.1.2. Motivation and resilience

My findings illustrate the students were motivated, for a variety of internal and external reasons to explore and attend the professional technical college. Some of the participants were hesitant, but then inspired upon visiting the school and witnessing the quality of instruction and educational opportunities available. The instructors are motivated by their love for their trade, and care for the students. The motivation to learn a trade brought the participants to the case study college, where they found transformative potential. The findings present evidence of resilience in how the students overcame arduous life events, from which they learned and formed motivational attitudes. At the college they entered a caring and intellectually challenging environment, set up to allow time and space to form deep relationships. The students' motivation to improve their lives by learning a trade, indicates the possibility for openness to change.

The program settings and behaviors support student motivation and resilience, such as; the cohort approach, the instructors' care, and teaching for critical thought and problem-solving skills. In 'Teaching for Transformation: from learning theory to teaching strategies', Kelly McGonigal (2005) explains key instructional factors in promoting transformation according to Mezirow's theory. She discusses the need to challenge thinking and present information that: does not fit students' existing premises; favors reflection and critical thought; invites discussion; provides opportunity for practice; and supports trustworthy relationships (McGonigal 2005).

Motivation appears to be irreplaceable in terms of transformation. It underpins self-directed learning and compelled them to the school. Without it, transformation is unlikely. My study indicates that the timing of their motivation is noteworthy. During the college timeline, whether returning to school or immediately following secondary education, students are, or are becoming, adults. As adult learners, the student's interest and motivation to learn are key andragogical principles (Knowles 1984:12). To improve educational success, adult learners 'accept a share of the responsibility for planning and operating a learning experience', (Knowles 1980:57), and it needs to be meaningful to them personally. My data shows examples of the participants taking ownership and selecting the direction of their education and career paths. Derek and Will both choose their professional technical programs despite career testing indicating they should pursue non-trade fields. Jason left a four-year school due to financial difficulty, and John left a university because he was so unhappy with the education and career path.

Like Jason and John, all the students in my study were highly self-aware. They were mindful of their past and obstacles they have overcome. At the end of their schooling, they knew had a plan and aspirations, and were eager to put their education to practice in the workforce. The students' age, experiences, attitude, motivation may allow them to be open to transformation. The teaching practices, then, are another key piece in transformative potential.

The students who succeed at the PTC are not stereotypical academic low-achievers. My findings demonstrate they were motivated, astute individuals, many ready and working for a change in their lives. Their resilience was clear in their stories as they displayed a positive outlook despite hardships. Rather than debilitate them, life events taught them how to cope and succeed. This is important as the life events become a source of motivation and an opportunity to flourish.

7.1.3. Transformative teaching practices in PTE

My findings reveal the instructors experienced their own transformative journey when they began teaching at the case study college. They came from industry into education with a passion for their crafts and a desire to share that with

others. As instructors, they understand the edge of discomfort present in learning and change, and they both relate to, and care about, their students.

Transformative learning has long been a desired element in higher education and so the premise of this research was an exploration into whether it would be present in trade school. The initial idea was if transformative practices were found in PTE, then this could be evidence contrary to some of the condescending perceptions stigmatizing the field. While researching transformative learning, I studied some of the common and prominently known factors, so I could explore their presence in the case study college. Such elements, as supported by the literature, include discussions, mentoring, caring, and critical reflection. Each of these is evident in the data, as transformative learning approaches are present in PTE, both explicitly and implicitly.

Critical thinking is a significant factor in transformative education (Cranton 2016) and the findings are rich with evidence in the PTC. Not only is problem solving and critical thought explicitly taught, but the students communicated examples of broadening their minds towards their classmates and future possibilities. Critical thinking is a facilitator of 'consciousness raising' (Cranton 2016:111). It is the emancipation of purposeful thought. This is important to this project as one's ability to think critically and practice a heightened awareness is evidence of the intellect contrary to the stereotypes tethered to tradespersons and technical education.

The development of critical thinking skills trains the mind for critical reflection and primes the individual for transformation. The students in the case study college are faced with a series of dilemmas, or problems to solve, built into the curriculum. They are met with situations that do not make sense and do not fit into any schema they already hold. Yet the instructor has already given them the cognitive tools to work through it and prods them to recognize that they do, in fact, have the ability to put those tools to use. Smaller dilemmas are practice for larger ones. Being able to conceptualize their way through a problem enables students to practice thought processes that can be transferred to other more complex situations.

Repeatedly the instructors and students shared stories of how their thinking was challenged to the point of feeling their brains stretched. These mental practices are developed in the specific scenarios presented in the classroom, then applied to other learnings, and eventually may be transferable to a variety of situations in and out of formal education. Further, research shows that experiential learning such as is paramount in the professional technical college significantly increases the development critical thinking skills (Coker 2010). Hands-on learning enhances the ability to conceptualize logical steps and reasoning processes to troubleshoot an issue and to explore possibilities for a solution. In Coker's study regarding experiential learning in occupational therapy, she wrote:

> Experiential learning involves hands-on experience in a practical setting to test information learned in didactic coursework in an actual practice environment. The emphasis is on learner self-direction and reflection about the learning experience (2010:281).

She goes on to say:

> Critical thinking and clinical reasoning skills are developed and improved when students focus on complex issues, delve into them, examine relationships closely, and process them in their own way. This suggests that experiential learning, with an emphasis on active learning strategies involving clinical application, may be the best method to improve critical thinking and clinical reasoning skills (2010:281).

The goal of PTE is to teach the skills required to perform well in a successful technologically evolving career. The instructors challenge students by presenting dilemmas, aimed at building toward the goal of higher competency. In this respect, the instructor expands existing skills, mindsets, and behaviors present in the student. Recalling Dave's example of presenting schematics at the beginning of the first year and how the students struggled to understand even the simplest diagrams, then their astonishment at the end of the program at how much they learned: a transformation occurred through learning how to think critically. This ability to think and reflect is not siloed to one activity set. When met with a situation the student didn't immediately know the answer to, Dave encouraged the student to back up to something they did understand and use the tools and resources they have to move forward and figure it out. My data shows that the college and instructors have laid the foundation for

transformative potential. The point is that transformation is not exclusive to the four-year college route but lies in other higher-educational endeavors as well.

The instructor's transformative experiences in becoming teachers prefaces the students' opportunities for transformative learning in their classrooms. Their reflective practice facilitates relationships with their students by way of the teaching approaches they choose, their care, and in providing a sense of belonging. These behaviors are facilitated by and strengthened in the cohort model present at the PTC.

7.1.4. The cohort facilitates relationships

The cohort model provides the opportunity for more meaningful relationships, trust, and the ability for the students to get to know one another well enough to understand and respect different opinions, as well as challenge their own perceptions against those of others. The critical thinking skills learned in the shops and labs may be transferred to understanding by reflecting upon learning through rich discussions with trusted individuals. These relationships not only aid accountability and success in the PTC, but they are important to transformative potential by granting the space to experience perceptions outside one's own mindset, and the time to consider assimilating the views of respected peers. 'Dialogue is the essential medium through which transformation is promoted and developed', (Taylor 2009:9). The cohorts provide occasion for in-depth discussions, which are a key practice in transformative learning.

The cohort model allows the students and teachers the opportunity for deeper dialogue, and to develop trust in one another. Trust amongst relationships in education may turn a disorienting dilemma into an opportunity for growth rather than putting someone on the defensive. Cranton (2016:15) states, 'When a person encounters something that does not fit with his or her expectations of how things should be based on experience, the choices are to reject the unexpected or to question the expectation', (2016:15). The closeness of the participants to their peers, and the time sent in getting to know each other creates a situation where they are more likely to listen to each other and consider another point of view.

The students who primarily entered the PTC to obtain the skills for a job were not actively seeking a perspective shift, transformation or enlightenment. The

students were motivated to learn the skills for a career, and at the college, began building relationships which encouraged learning and posed challenges to their perspectives. Both their motivation and the relationships in education lead to self-satisfaction and meaningful moments of finally understanding a concept, realizing the value of knowledge, or gaining self-confidence. Each time the student has one of those moments of realization and self-awareness, the opportunity for a shift in perspective is present.

7.2. Circular framework of transformation

The findings revealed a framework made up of key elements of transformation. My analysis revealed three global themes and several sub-themes, discussed in chapter six. The thematic map, in figure 6.1 displayed motivation, relationships and reward supported by experiences, behaviors, and attitudes derived from the participants stories. All of these elements contribute to transformative potential, and the removal of any one of them could compromise the process. My data indicates that transformation is a continuous process, initiated by the student as they entered the PTC, then fueled and supported by the elements as shown in figure 7.1.

The framework applies to the instructors as well as the students. The case study PTC is steeped in a learning culture. The instructors, having gone through their own transformative processes in becoming teachers, are continually learning and modifying their craft in order to serve the changing student body and their futures. They are experts of their trade, and continually honing their craft, becoming masters of the complexity of teaching. The approach of teacher-as-learner keeps the transformational framework spinning and enables the instructors to better understand and connect with their students. Even the participant instructors who had been at the college for more than twenty years were still transforming and refining their practice. Rather than act solely as if teacher is the supreme deliverer of information, the instructors, since they are also learners, have the freedom and confidence to lecture, to scaffold, and to let their students explore.

Figure 7.1: Circular framework of transformation.

7.3. Recommendations

In this section, I present four recommendations as a result of this research. These recommendations are intended to be applicable in a variety of learning environments. Though the literature review revealed there is relatively little research on transformative learning directly related to professional technical education, I believe this project adds to the body of research and warrants further exploration on this topic, and serves as evidence that PTE is indeed, higher education. This research supports PTE not only as a pathway to a good and secure job, but as an opportunity for intellectual growth. The recommendations are transferable to the extent that other institutions' faculty and students can understand a vivid description of the participants situation, and the structure of these programs. The exact learning environment need not necessarily be modeled, as we've seen the presence of transformative learning opportunities can happen in a variety of situations. Of these recommendations, three are practices based on the findings, and the fourth is a call for further research that may further support eliminating the stigma surrounding trades education.

7.3.1. Create opportunities situated in a transformational framework

Research and literature encourage transformative education (Apte 2009, Armbrecht 2018, Briggs 2015, Christie et al. 2015, Cranton 2009, 2012, 2016, Dirkx 1998, Kear 2013, Lawrence 2012, McGonigal 2005, Mezirow 1975, 1991, 1997, 2009, 2012, Quillinan et al. 2019, Taylor 2009), and this is not limited to four-year institutions. By utilizing the circular change framework, programs may create opportunity for transformation anywhere a student is motivated to learn and open to change. This is not exclusive to PTE. Schools and instructors can create a safe, transformative environment by facilitating the following:

1. Approach the educational environment from a teacher-as-learner perspective. Talk with other instructors, reflect on one's practice, avoid complacency in thinking the art of teaching is finite. Share and seek knowledge from other teachers.
2. Be aware of the students approaches to learning, and their motivation for attending.
3. Care for the students and create a culture of belonging.
4. Create opportunities for dialogue and allow time for these discussions to invite personal perspectives.
5. Provide the cognitive tools for learning: encourage the students in their ability to think critically.
6. Keep the outcomes learning-focused, rather than performance-focused. The rewards should be intrinsic.
7. Capitalize on the 'a-ha' moments by continued application of the new awareness and inspiring further challenge.
8. Encourage self-reflection. Create opportunities for students to; a.) look back on their progress, and b.) engage meaningfully with people with differing points of view.
9. Motivate the students and be proud of their accomplishments.

Employing the circular framework of transformation in curriculum development, by creating the time and space to motivate, care for, and challenge thinking encourages transformative learning. It is important to recognize the different in letting the students direct and own their assimilation for knowledge rather than providing them unilaterally with information. Let them wonder and nudge them when they struggle too long, but don't just hand them answers because those a-

ha moments are crucial, and they are most profound when facilitated by the learner.

7.3.2. Present PTE as Higher Education

I believe it is time to talk wholeheartedly about PTE as higher education. It's an honorable, transformative opportunity for the intellectually engaged and keen kinesthetic learners. For decades, much of the literature and policies regarding PTE have been aimed at recognizing the stigma and seeking change in order to fill jobs. Rarely is the reasoning behind improving the image an acknowledgement of the intrinsic value and personal growth as with a four-year education. Once PTE is recognized as an intellectual pursuit on par with other forms of higher education, then perhaps those who prefer experiential learning, working simultaneously with their hands and minds, will be more able to proudly claim their self-directed learning route, and be supported by those who influence them. This research provides an argument for eliminating the delineation between further and higher education and recognizing all tertiary education as transformative learning opportunities.

7.3.3. Encourage secondary faculty and staff to understand PTE

In order to better support the future students of PTE and enable more freedom of choice in higher education, the high school students would benefit from those with influence over their career paths better understanding the real value and opportunities in PTE. Coaching, mentoring and experience in the PTCs might bring a more accurate awareness to the holistic educational environment, the academic rigour, and the cleverness of the students who succeed. It needs to be more than forced equal billing to technical education post high school, but a keen understanding of the complexity of the skilled trades and transformative potential.

The participants reported hearing attitudes from faculty and guidance counselors in their high schools indicating that tech school would be a waste for someone as smart as they are, or the worst-case scenario for a troubled life. Some relayed PTC wasn't presented as an option. I encourage guidance counselors to visit the programs, challenge their point of views and mindsets to open up and assimilate what PTE and people in the skilled trades can do. I hope they experience their own transformative learning and perspective shift as they

work through the dilemma of meeting brilliant minds and witnessing projects in an environment previously assumed to be for the non-college bound. I hope they learn to consider what the student is passionate about over their grade point average when presenting higher education options.

The action of promoting a four-year education based solely on secondary academic success without regard for a truly student-centered and self-directed opportunity is flawed. Sending students to a university without passion or drive may at the very least, waste their time and money. Adult students should want to pursue their education with purpose in order to most effectively experience success and be able to transfer their learning to a satisfactory livelihood (Knowles 1990). In short, whether it be to a university or a trade school, or any other higher education option, if the student is internally motivated, counselors and teachers should honor their choice without prejudice. If a student feels best when working with their hands and thrives on the satisfaction of troubleshooting and repair, it should be recognized, and acceptable, that trade school could be their best route.

7.3.4. Explore the general satisfaction of skilled artisans

Briefly, I wish to present an idea that was not sought in the research, and was not directly questioned during the interviews, but that has persistently impressed me throughout this project. There was something generally positive in the nature and attitude of the participants, that reminded me of my dad. They were at ease with themselves. I wonder if there is a liberation or autonomy that comes with knowing how to build and repair, and how this may contribute to contentedness. Most of the participants were calmly confident and I'm now so curious if perhaps intellectual hands-on productive work is a factor in happiness. This idea, and further implications of how the participants' well-being could be either an impetus or result of transformation, needled me throughout the analysis. If there is evidence that skill in the trades enhances peace of mind, it could further challenge the lingering stigma. Ian Jack relays Crawford's (2009) image of a repairman:

> He has to use his brain to figure problems out and his clever hands to correct them. Remarkably few problems are exactly the same; he meets people as well as dysfunctional machinery and often earns their liking and gratitude; he earns good money; the work

> won't vanish to India; he needs no workshops in self-esteem (2009:np).

When I reflect on the intellectual engagement required when working with one's hands (Crawford 2009), the increased transfer through kinesthetic learning (Daffron and North 2011), and the satisfaction at the end of the day of having constructed during my short experience as an apprentice electrician, I can't help but wonder that there is a link to happiness and actualization. Perhaps there is an intrinsic means for validation within most people that could be satisfied by manifesting something of ourselves in the world. Working with our hands seems to have a profound effect on the mind. I believe it would be very interesting to study a possible link between skilled artisanship and happiness, and the implications this could have for education.

7.4. Conclusion and reflections

This final section summarizes the results of this exploration into transformative potential in Professional Technical Education, my reflections on the findings, and what I have learned throughout this journey.

7.4.1. Research Results

This research was undertaken to seek transformative learning with in a Professional Technical College in case its presence may in turn shift current stigmatized perspectives on the trades. Though there is no basis for claiming causation, I confidently report elements of transformative teaching are practiced at the college, and the students shared stories of life changes. The instructors experienced their own transformation upon coming into the college to teach from industry, and work to deliver a caring, challenging, astutely andrological practice. The teaching of critical thought, reflection and problem solving is explicit in the curriculum. They administer activities and take time beyond the class and lab practicums to ensure the students are cared for and enjoy a sense of belonging. They facilitate discussions and the opportunity for trust to develop between the students and within the teacher-student relationship. They set the stage for transformation.

The students came to the college motivated. Some were prompted by an injury, some the prospect of a new career, one just to get off the couch. They came

with a host of backgrounds and life events, and many found relationships and reward that motivated them further. The elements of the circular framework for change, and its ability to promote transformation are not exclusive to the case study college; it can be practiced in a variety of institutions.

The literature review revealed many articles admitting to the stigma surrounding work in the trades and PTE. The literature further acknowledges the pressure for young people to pursue a four-year degree, despite the call for skilled workers in high-paying jobs. Policies and funding are provided to encourage students towards the trades to meet economic needs, but very little suggests PTE is valuable in and of itself. This research presents a different story. The case study college offers a quality and sound educational model that enables students' holistic growth and the ability to secure gainful careers. The expertise required to perform a highly technical job and continue to develop on pace with the rapidly changing fields is profound.

Education for the student, is eventually education for the betterment of society. For it is by meeting the students' needs and sparking their interest in the pursuit of knowledge in a manner that is meaningful to them, that creates opportunity for critical thought and productive livelihoods. The results of this research challenge the stigma of PTE and present a successful model of higher education.

7.4.2. Reflections

Periods of my life have been peppered with character-building used-car trouble, during which I would often take a rattling car to my dad for help. I used to make jokes about the twenty or so minutes he spent just looking at the car. He would listen to my descriptions and patiently turn the key or peak under the hood, then he would open a beer and stare. Sometimes I felt bad interrupting him when he had friends over, but they were all always happy to assist, and especially to partake in that curious period of quiet.

I know now that those minutes were spent in critical thought, figuring it out. Those gentlemen were reflecting upon the possible causes and methodically mapping out the least-to-most invasive course of action. The insight and knowledge to apply this over the variety of vehicles presented in this plight over the years is impressive. When they did begin to act, it was tidy, efficient, technologically sound, and good natured. I stood helpless holding tools I

struggled to remember the names of, watching in awe as they uncovered the labyrinth I depended on to get to school and work, but knew absolutely nothing about.

Research is not exclusive to a report or dissertation. It is a habitual practice in the quest for understanding and improved behavior. Somedays I wish I could undo what I've learned in the course of this project. Somedays it would be easier to find more personal truth in the mundane and less in the profound, for consciousness raising is not synonymous with liberation. What I have learned most is that transformative education, in its various forms and venues, and even when it is a struggle, is really a means towards autonomy, enlightenment, and peace.

Having now a deeper sense of transformative learning and the wide expanse of situations it may be present in, I have an obligation to act. Each time I hear of PTE's absence in secondary level school career fairs, I speak up. The colleges are active in their programs and it is clear there are high quality educational options. It seems the gap is earlier in the students' path, from familial, primary, and secondary opinion. This project has oriented and motivated me to take a more active role in education in the endeavour of communicating the reality of PTE to those who might not yet understand.

In writing this work I've also come to value an explicit demonstration of caring towards others and creating educational spaces with a sense to trust and belonging. The process of transformation is often uncomfortable. Consciousness raising is not always liberating, but it does provide bearings so students can better choose their direction. I am an example of this and can relate to students in this regard. The teacher is still a learner, and in this sense, we are often more similar than traditional assumptions of the teacher-as-master stance allows.

The model of transformation created offers a powerful means for designing courses for transformative potential and I aim to publish in this regard. It seems as if courses in my experience are structured with check boxes only about topics, rather than how I can learn it and what a difference learning could make. The circular transformation framework invites dialogue, critical thought, caring, and reward into the classroom. Understanding this process while uncovering it throughout this dissertation has inspired a personal evolution of sorts. Prior to

this work I knew my dad was good primarily because that was the frame of reference (Mezirow 2012) I developed growing up. Now I catch my breath in admiration knowing just how good, and understanding a bit more of the possibilities for transformation in all of us.

I'm now tickled by the notion that someone such as my dad who provided well for his family, could calmly and masterfully assess and repair any household need, can put ideas to paper then sculpt and build them into life-size fruition with his own two hands, and do this with a sense of humor, and self-satisfaction at the end of the day, isn't just smart, but wise. That quiet twinkle in his eye says he knows something we don't know. While figuring out how to build a house and fix cars, he figured out a good and satisfying life that his children are proud of. Apart from the endless race of white shirts and shiny shoes in the maze that makes up so much of the current economic condition, he literally and figuratively constructs a place to settle. Imagine the empowerment in that ability.

7.4.3. Conclusion

The stigma attached to education in the trades is wrong, not only because this work is in high demand, but because the education itself is delivered by committed, passionate, and caring andragogical instructors, to highly-capable students in a higher education environment.

Perhaps not everyone in education will experience transformation, but transformation can happen anywhere. This is important because transformation is a desired element in higher education, purposed for consciousness raising, and it is happening in an environment that is stigmatized as being suited for the less intelligent. The data demonstrates that this is not the case. Professional technical education is, like four-year colleges and universities, higher education.

While lessons and learning activities change over time there is a comprehensive goal of education to prepare members, typically youth, of any society for participation in, and the betterment of, the communities in which they live. What this looks like over time and space varies, but the premise is the same whether at any given moment said education is a kindergarten classroom, a master's philosophy class, a teacher training class, or an industry conference. Education is a catalyst for maximum human achievement, but who gets to

decide what it is to reach human potential, and is it always so benevolent? While I have my own hopes for a global direction of education, I believe it is conditional, and dependent upon who or what body is setting the agenda. Are we teaching for assimilation or change, and are these exclusive? An education I don't agree with is still, to someone, an education. With all respect for his work in education, I hear an unspoken point to Dewey's claim regarding the purpose of education being to develop youth in an orderly manner into members of society. People may become members of society whether or not they participate in any formal education. Therefore, perhaps a more accurate statement of the purpose of education was to provide the young with what they need to be members of society according to the governing bodies of the time.

If there is one ultimate purpose of education I imagine it's as vague as the process by which information and skills are imparted to an individual on the assumption they are going to be affected in some manner and do something with their learnings. What this looks like depends on the stakeholders; whether they are advocating free thought, critical reflection, or a political agenda. It is between the opportunities presented by the governing institutions and the will of the student to either partake or not. If a student has no other experience to interpret, no awareness that their own human existence is distorted (Foshay, 1991) are they not still subject to education? The one constant is the student: their motivation, effort, interpretation and actions. There is a danger:

> The function of education is to teach one to think intensively and to think critically. But education which stops with efficiency may prove the greatest menace to society. The most dangerous criminal may be the man gifted with reason but no morals. We must remember that intelligence is not enough. Intelligence plus character – that is the goal of true education. (King Jr 1947).

More than the dissemination of information, education should teach people to think and consider, to explore and adapt, to identify and solve. This ability is not based on only taking in facts, 'we have to understand the significance of what we see, hear, and touch, (Dewey, 1938:68). There is a discerningly keen level of skill and artistry required in the trades, and the respect of this has been compromised in the in the shadow of advancing the four-year degree path. Professional technical education has become undervalued and this has cost the crafts creative and capable individuals, and the work they might have

accomplished. It's also costing students rich and fulfilling career opportunities. The stigma is a significant dishonor to student-centeredness in education, and to the work that supports much of the infrastructure of our communities.

Unless we are discussing the history of professional technical education, it is time to stop talking about the stereotypes. I believe it is time to talk less about what PTE is *not* and start discussing more about what it *is*: higher education ripe with transformative potential, rich in opportunities for critical thought, self-reflection, self-directed instruction, and cultivation of the practical and theoretical skills needed for in-demand, competitive-waged, engaging careers with high job satisfaction for the life-long learner. It does all this in half the time and at a fraction of the cost of a four-year education. Should everyone learn a trade? Probably not. Not everyone should master a trade any more than everyone should master a liberal arts degree, but there is nothing but our habits of mind prohibiting both the skilled auto mechanic and philosopher from residing within the same person.

Appendices

Appendix A – Ethical approval

Research Ethics Application Approved [Vocational education and transformative learning theory: To what extent is transformative learning present in vocational education?]-[400150207]

ResearchEthicsSystem@glasgow.ac.ukm Sep 2, 2016, 6:12 AM

Dear Brandi Stevenson,

The following research ethics application has been approved:

Project Title	Vocational education and transformative learning theory: To what extent is transformative learning present in vocational education?
Application Number	400150207
Committee	College of Social Sciences
Submitted By	Dr Fiona Patrick

Approval of amended documents:

College Research Ethics

Request for Amendments - Reviewer Feedback

Ethics Committee for Non-Clinical Research Involving Human Subjects

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Application Details

Staff Research Ethics Application ☐ Postgraduate Student Research Ethics Application ☒

Application Number: 400150207

Applicant's Name: Brandi Stevenson

Project Title: Vocational education and transformative learning theory: To what extent is transformative learning present in vocational education?

Original Date of Application Approval: 03/09/2016

Date of Amendments Approved: 10/11/2016

Outcome: Amendments Approved

Appendix B – Introductory letter to the President of the college

University of Glasgow

College of Social Sciences

Name
President
Case Study College
Address
City, ST Zip

- Date -

Dear ,

I am an EdD student at the University of Glasgow, though I reside in (county name) County. I am writing to seek your permission to interview staff and students at (the college) as part of my research study for the EdD dissertation. The title of my research project is Vocational education and transformative learning theory: To what extent is transformative learning present in vocational education?

The purpose of this study is to explore whether or not, and to what extent, transformative learning is present in vocational education. This research will explore understandings of transformative learning in vocational education and will add knowledge to the field of vocational education being a respected choice for students, thereby promoting vocational careers. Although perceptions are changing, there is still a stigma sometimes attached to those who choose or are encouraged into a vocational education rather than a four-year institution. As Transformative Learning Theory has garnered respect worldwide, evidence of its presence may shift current perspectives towards a more positive view of vocational education. This could improve the comfort and self-esteem of students, and empower them to choose their education based on personal strengths, goals, and values.

I hope to interview you, 8-12 Instructors, and 8-12 students for no more than one hour, and see curriculum materials if the instructors are willing to share those with me. Program focus will be Automotive, Electrical, Welding, Home Inspection, Machining, HVAC and Diesel Technology. I will bring the Participant Information Sheets, consent forms, and Interview themes should you agree to meet.

I am very excited for my research both in pursuit of the EdD, and because growing up in a family supported by vocational careers has made this project close to my heart. I hope to hear from you soon to schedule a time to meet for your approval to conduct this research. I must forward your approval to the University of Glasgow Research Ethics Office prior to commencement of the study.

Thank you so much for your time.

Brandi Stevenson

This project has been considered and approved by the College Research Ethics Committee.

For further information, or to pursue any complaint, contact the College of Social Sciences Ethics Officer, **Dr Muir Houston, email: Muir.Houston@glasgow.ac.uk**

Appendix C – Consent to conduct research

University of Glasgow

College of Social Sciences

Consent to Conduct Research Form

Title of Project: Vocational education and transformative learning theory: To what extent is transformative learning present in vocational education?

Name of Researcher: Brandi Stevenson

I confirm that I have read and understood the project materials, including the Participant Information Sheets, consent form, and interview themes for the above study and have had the opportunity to ask questions.

I understand all participants will be at least 18 years of age.

I understand that all participation is voluntary and participants are free to withdraw at any time, without giving any reason.

I consent to interviews being audio-recorded. I understand that the interviews will occur on campus during the 2016-17 academic year, with the instructor interviews being held in the fall/winter, and the student interviews in the late winter/spring.

I acknowledge that participants will be referred to by pseudonym, and neither (the college) nor the programs/departments will be specifically identified.

Regarding the data and storage, I understand:

- All names and other material likely to identify individuals will be anonymised.
- The material will be treated as confidential and kept in secure storage at all times.
- I agree to waive my copyright to any data collected as part of this project.

I approve the above study to take place with (the college) students and staff.

Signature …… Date ……
Name, Title
Institution

Signature …… Date ……
Brandi Stevenson, Researcher

Appendix D – Participant information sheet - faculty

Research Title: Vocational education and transformative learning theory: To what extent is transformative learning present in vocational education?

Researcher: Brandi Stevenson, EdD Student

You are invited to take part in a research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

Thank you for reading this.

The purpose of this study is to explore whether or not, and to what extent, transformative learning is present in vocational education. To do this I wish to interview Faculty Staff and Students of Vocational Education programs. Participation is voluntary, and you can withdraw from the study at any time without giving a reason.

If you decide to take part, you will be interviewed for no more than one hour. There may also be one or two follow up emails or phone calls if clarification is needed. The interviews will be audio recorded. All interviews will be held during the 2016-17 academic year. The Instructor interviews will be in the fall and winter. The student interviews will be in the late winter and spring. If you do not object, it would also be helpful for me to see course documentation (such as the course handbook, curriculum overview, and lesson plans). You do not have to share these with me, but if you do it will inform my understanding of the program and courses that you run.

Your personal details will be kept confidential by allocation of pseudonyms. Confidentiality will be respected subject to legal constraints and professional guidelines. Neither BTC nor the programs/departments will be specifically identified. BTC will be referred to as a technical college in the Pacific Northwest region of the United States. The programs within which the instructors and students are interviewed will be widely referred to as technical professional, vocational, or skilled trades.

All participants shall be at least 18 years of age. This is considered a low risk study as none of the participants are identified as being part of a vulnerable population, the interviews will take place on the college campus, and the participants will not be asked questions of a sensitive nature.

The data collected will be used to explore evidence of transformative learning. It will be stored electronically under password protection, and paper copies will be under lock and key. All data will be destroyed upon the completion of the research project, or no later than January 2019.

The data will be used to complete the dissertation for the EdD from the University of Glasgow. It may also be made available to peers and colleagues in journal articles, written summaries, and/or conference papers.

The research participants can have access to a written summary of results, a copy of the final manuscript, and they may attend a presentation of the research and results.

This research is not funded by any organisation.

This project has been considered and approved by the College Research Ethics Committee.

For further information, contact the researcher at b.petz.1@research.gla.ac.uk or the Supervisor, Dr. Fiona Patrick at Fiona.Patrick@glasgow.ac.uk. To pursue any complaint, contact the College of Social Sciences Ethics Officer, **Dr Muir Houston, email: Muir.Houston@glasgow.ac.uk**

Thank you for your time.

Brandi Stevenson

Appendix E – Participant information sheet - student

Research Title: Vocational education and transformative learning theory: To what extent is transformative learning present in vocational education?

Researcher: Brandi Stevenson, EdD Student

You are invited to take part in a research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

Thank you for reading this.

The purpose of this study is to explore whether or not, and to what extent, transformative learning is present in vocational education. To do this I wish to interview Faculty Staff and Students of Vocational Education programs. Participation is voluntary, and you can withdraw from the study at any time without giving a reason.

If you decide to take part, you will be interviewed for no more than one hour. There may also be one or two follow up emails or phone calls if clarification is needed. The interviews will be audio recorded. All interviews will be held during the 2016-17 academic year. The Instructor interviews will be in the fall and winter. The student interviews will be in the late winter and spring.

Your personal details will be kept confidential by allocation of pseudonyms. Confidentiality will be respected subject to legal constraints and professional guidelines. Neither BTC nor the programs/departments will be specifically identified. BTC will be referred to as a technical college in the Pacific Northwest region of the United States. The programs within which the instructors and students are interviewed will be widely referred to as technical professional, vocational, or skilled trades.

All participants shall be at least 18 years of age. This is considered a low risk study as none of the participants are identified as being part of a vulnerable population, the interviews will take place on the college campus, and the participants will not be asked questions of a sensitive nature.

The data collected will be used to explore evidence of transformative learning. It will be stored electronically under password protection, and paper copies will be under lock and key. All data will be destroyed upon the completion of the research project, or no later than January 2019.

The data will be used to complete the dissertation for the EdD from the University of Glasgow. It may also be made available to peers and colleagues in journal articles, written summaries, and/or conference papers.

The research participants can have access to a written summary of results, a copy of the final manuscript, and they may attend a presentation of the research and results.

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Thank you for your time.

Brandi Stevenson

Appendix F – Consent form

University of Glasgow

College of Social Sciences

Participant Consent Form

Title of Project: Vocational education and transformative learning theory: To what extent is transformative learning present in vocational education?

Name of Researcher: Brandi Stevenson

I confirm that I have read and understood the Participant Information Sheet for the above study and have had the opportunity to ask questions.

I confirm that I am 18+ years old.

I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason.

I consent to interviews being audio-recorded.

I acknowledge that participants will be referred to by pseudonym, and neither BTC nor the programs/departments will be specifically identified.

Regarding the data and storage, I understand:

- All names and other material likely to identify individuals will be anonymised.
- The material will be treated as confidential and kept in secure storage at all times.
- I agree to waive my copyright to any data collected as part of this project.

I agree to take part in the above study.

Name of Participant …… Signature ……

Date ……

Name of Researcher …… Signature ……

Date ……

Appendix G – Email to faculty to request interview

University of Glasgow

College of Social Sciences

Dear ,

I am student at the University of Glasgow, Scotland, though I reside in (county name) County. I am writing to request an interview with you for my research study in pursuit of a Doctorate in Education. The title of my project is Vocational education and transformative learning theory: To what extent is transformative learning present in vocational education?

The purpose of this study is to explore whether or not, and to what extent, transformative learning – or a change in the learner's perspective – occurs during professional technical education. I hope to interview you for no more than one hour, and see curriculum materials if you are willing to share those with me.

The interview will be informal, and address the following:

- Demographics
    - Age range
- Teaching Experience
- Aims of education for their courses and in general.
- Teaching methods used and preferred by the faculty member
- Are/to what extent are the following used:
    - Critical Thinking
    - Self-Reflection
    - Classroom Discussion
    - Mentoring
- Request to view curriculum/teaching materials

If you agree to be interviewed, you will remain anonymous in all documents produced from the research. I've attached a copy of the Participant Information Sheet for more information.

This research has been approved by both the University of Glasgow, and (the college).

I am very excited for my research because growing up in a family supported by vocational careers has made this project close to my heart. I hope to hear from you soon, by phone at xxx.xxx.xxxx or by email so we can arrange a time to meet.

Thank you so much for your time.

Brandi Stevenson

Appendix H – Interview themes

Instructor Interview Themes: Fall of 2016

- Demographics
  - Age range
- Teaching Experience
  - How long have you been teaching
  - How did you come to be a teacher – path to getting here
  - Teacher training – where did you go to school/etc
  - Challenges?
  - Benefits?
- Aims of education for their courses and in general.
- Teaching Methods/ Models used and preferred by the faculty member
  - Typical day in class
  - Is there a text or handbook? How/in what capacity is that used?
  - Class time v field time? What happens in each?
- Knowledge of Transformative Learning
- Are/to what extent are the following used, and why:
  - Critical Thinking
  - Self-Reflection
  - Classroom Discussion
  - Mentoring
- Request to view curriculum/teaching materials

Student Interview Themes: Spring of 2017

- Demographics
- Why was the vocational program selected?
- Were other types of post-school education considered, or going straight into work
- Career goals?
- Benefits of the courses taken
- Challenges with your studies?
- What opportunities do they have now, if any, that they didn't before
- Have these courses changed you in anyway? How?
- Changes in confidence/self-esteem
- World perspective changes, if any
- Experience with factors that promote transformative learning, such as:
  - Critical Thinking
  - Self-Reflection
  - Classroom Discussion
  - Mentoring

College President Interview Themes

- Mission/Vision of the College
- Demographic

  - Name
  - Age range
  - Gender
- Path to becoming President of BTC
- Motivation/why chose this path
- Teaching Experience?
  - How long.
  - How did you come to be a teacher
  - School/Training – where did you go to school/etc
  - Challenges?
  - Benefits?
- Aims of education for the institution.
- Knowledge of Transformative Learning
- Are there methods or aspects of education that are institution wide?
- Is there a structure for Instructor guidance/training/accountability?
- How much freedom do the teachers have in designing their own curriculum?
- Continuous improvement/continuing education?

Appendix I – Example Transcript

DAVE – Instructor
2 December 2016
Interview time 1:45.11
Location – Dave's office
Formalities prior to recording. Identifying words modified or removed.

B – Tell me, please, about your path to this job.

D - My personal path?

B – Yes

D – I have a syllabus for you… (hands papers to me). I come from industry, the (names type of trade) industry. I don't have a background in education. It was after my – what we would then call vocational training – I worked in the trade for about 10 years and then I started doing adjunct instruction, night classes, in the (trade) sector. So, I was a working technician during the day then I was working for (corporation) tools and the Department of Ecology. Then I heard about this opportunity up here. I'd never considered teaching as my future. I was going to be a technician forever was my thought in my 20s. Um, and then I applied for this position and it just kind of happened. I was never really in search of this. And then when, uh… well, I've been here since 1996. So, when I acquired this position I didn't have any formal teaching training or anything like that. That's not uncommon at our technical college, or any technical college, for people to come out of industry. You have to go thru a pre-tenure process, but you're also required to go through a vocational education certification training to obtain your vocational teaching certificate. Right? I don't know how familiar you are with all of this…

B – I'm not…

D – Ok. So. If you're coming out of industry like I did, there are 2 paths. You either have your education experience so you can bypass some of that. I did not, so we have to take – this was back then but it's similar now – you have to take four education courses. One of them is something like the 'Elements of teaching' right? And it is specifically designed around non-education background people coming into teach. Not necessarily full time, but it's primarily angled to somebody like me, right? Not necessarily adjunct faculty – some of them choose to take those courses, but sometimes they don't.
So, we have to take the full 4 courses. You get History and Philosophy and education, I think they've changed the name now but there is still that course. Anyway – there are four courses – I'm not going to be able to remember them now, but they are essentially on understanding learning. That was a big part. Things like learning styles. Things we'd never thought of before, you know, that as the lightbulbs go on, not all students learn in the same way. We learn those kinds of things, then into more curriculum development kind of stuff. Those are the courses that everybody in the state that I'm aware of, would have to travel through to get to my position. At the time I took them from (names university about a three hour drive away). We actually offer them here now at (the college) because we have so many people that come in from industry that is was just logistically impossible for them all to head (three hours away) once a

month. It was difficult. A whole group of us on campus were hired at the same time and did the classes together.

B- So, you were hired and started learning to teach at same time.

D – Oh yeah.

B – You were doing both at the beginning…

D – Oh yeah – the first year I was like 'what is this??' My luck or benefit was that I'd done some evening classes, like I'd said before. I'd taught at (names college) but it was specific for the Department of Ecology. I was doing (environmental) Where this all started – I don't know how much of a back story you need or care about…

B – I like it all…

D – Ok. So, because… I was born and raised in (another state), I worked in the industry there. Got married, moved to (this state). Landed in (names city) and, um, down there they instituted an (environmental) program, just like they do in (city) and in (city) right now, right? So, while I was living down there and working as a tech they started this program and then the Department of Ecology realized that when you start this program in a new area the local technicians do not have the training or understanding of (this environmental) program. So, a little bit of asking around - and they said 'hey this guy's right from (state) where they had to do all that, he has all the certifications, let's see if he'd be interested in helping other people learn about this'. Anyway, my name came up, I got hired by (college) specifically to teach these evening courses and that's what kind of started the ball rolling, right?

B – Ok.

D – And then (corporation/brand) tools who at the time was also a large training entity in our industry - they hired me to do some training in (nearby city). So, I'd do like two nights a week at (college) then two nights a week in (nearby city) and um, believe it or not, even though I did not have formal education experience – until you are in the classroom working with adult learners – you can take all the training you like – but you don't really get it until you are in the classroom. I learned a lot. So, when I got handed the keys here to this building and my first group of students, um, I wasn't completely a fish out of water. However, that's not uncommon on campus. You'll have someone who has been installing furnaces and commercial units for 25 years and then suddenly they are handed a classroom with 25 students starting at them. And they may be an expert in their industry, but they don't understand learning or teaching or any of that.

B – Right.

D – So, of course, even at the high school level – there may be those who do have the education background, but they don't really know how to teach. It's the same thing here. With my path – I interviewed, got hired, then the quintessential 'there's your building, here's your keys, good luck with that.' I was literally standing outside the door here with the dean at the time asking if

we had textbooks. And this is dating myself, but I also asked if we had slides, overheads, what? He said it's all in there, bye. Just handed me the key and walked away. The former instructor that was here had been transitioned out, so there was a gap in time, so when I came in there was no instructor here. Typically, a faculty from a similar program will try to take you under their wing.

B- Sure, like an apprenticeship?

D – Yeah. So again – this was 21 years ago. Our (trade) and (trade) programs work very closely together because we're related. He'd only been here a few years; however, he was a little older than I was and, um, he had already started the transition. So, he and I teamed up a lot and there was also a veteran instructor who was kind of a dinosaur, but on the flip side he was able to help us keep our heads about us, and not get lost in the first year of teaching craziness. When you start that first year, when you get in here…the dean I had at the time was very much just a 'throw them into the water and let them swim' type of guy. That was his perspective. You know, like if I come in and try to help you with all of this, you know, it'll be 5 years before we get you up and running. It's better to just go cold turkey. In today's world that probably wouldn't happen as much. We were like 'there's probably a syllabus around here someplace.' But we did have a tenure process back then which is the same as it is now. For three years you are observed. You go through a committee being observed by multiple faculty twice a year. It was the same back then, it's just more formal now. Much more developed.
So, when a new instructor - We just had an instructor transition out after 33 years, so we are getting someone new right out of industry who is a graduate of the program. And, um, he is in syllabus hell, that's basically where he is right now. Watching his process compared to my process, twenty years later there is a big difference as far as the mentoring. But on the flip side there is a lot more paperwork, a lot more committee and faculty responsibilities, and a lot more hoops to jump through. Because another thing that is somewhat unique here is we are all considered departments. He is a one instructor program, so he is also his department head. I'm the department head in automotive which means we have to manage our own budgets, travel, paperwork, credit cards for the program.

B – By you. You're the only instructor in this program?

D – There are 2 instructors in this program, I'm the department head. It's a less formal, but I'm the budget authority and stuff like that.

B – Ok. Is that the way it was 20 years ago?

D – I was a one instructor program back then. So yeah.

B – So you weren't just learning how to teach…

D – Yep. Learning how to teach, what to teach, here's a budget, Oh and computers…

B – You were the administrator, everything.

D – Yep. Everything. And computers were… you know it's funny to think back that far but we didn't even have a network on campus, right? So, computers were new, and they had just put our budgets on excel and they were like excel is a spreadsheet and this is how it works. It's funny to think about that now. But it's a lot to absorb. And what you'll find – I'm trying to get the flavour of your research – but what you'll find is that this is not uncommon in the voca—in the trades area, anything professional technical…I don't know – and please don't get offended, but I don't know that any academic person maybe understands what's involved in the technical educations. In our state, maybe as you go out in the communities, like the (names another technical school) program where they are a two-instructor program - so one of the instructors is in charge of budgets and all that, they have to still manage all that. Where if you went to, say, an English department at (local university), you're not necessarily going to have faculty members making budget decisions and all that, right? So, um, this makes it a lot more…it gives a lot more freedoms, however it adds a lot more responsibility. So anyway, over the years we've been able to develop and grow the program. And I think for our geography, for where we are at in the United States, we are probably sized about correctly. We'll have people come in, new administrators that say well don't you want to grow the program, but I think it's sized about right right now. Our graduates are getting jobs, we don't want to flood the market. So, we've been able to develop this into a two-instructor program and I think it cruises along pretty well. I don't' know how well I answered your r original question…how did I get here.

B – You did.

D – Ok. So, the 20 years go by in the blink of an eye.

B – I'm sure. Do you have continuous learning requirements?

D – Um, yes.

B – Either for the (trade) industry or for teaching?

D – Ok - so that's a great question. When you are pre-tenure you have professional development that is mandated. It's been so long now, I think it's 40 professional development units.

B – Is that like hours?

D – It can be hours, or credits if you're taking courses, right? There are multiple ways to do that. Um, once you're granted tenure, the answer is no, but we do have to do a professional self-assessment every year and part of that is maintaining our industry strengths, and another part is growing and expanding in our education experience. But once you reach tenure, it's not formally policed, as you would say. Now in our industry – yes, we are required to maintain… (addresses other instructor the just came in) the industry requirement it what…20 hours a year? For instructor training?

P – Uhhhh…yeah… 20 hours.

D – 20 hours. He's our other instructor… (introduces us – I explain interview and that this is being recorded).

D - So yeah, we have to maintain at least 20 hours of industry experience per year for our industry accreditation.

B- Ok. So in your trade – it has changed in the last 20 years… (laughter and agreement)… is that what the 20 hours keep you up on?

D- Yeah. And we're not…if we only received 20 hours of training on that we would be so far behind.

B – Yeah, you'd never keep up.

D – Right. So, what we do is, um, we (instructors) focus on emerging technologies (for professional development requirements). But the reality is we really stay focused on what I call our customers. When I look at what my customer – a local shop – wants from me. They say it's great that my students have some exposure to the high-tech cutting-edge stuff, but the reality is that when they get out there, they are starting on the bottom and what they need are some foundational skills that are hard to get in the work place. The real foundation - whether it's mechanical, electrical, whatever – are primary to what our outcomes need to be of this program. The cutting-edge stuff that WE need to stay versed in, often times is not what the students really need to have completely locked in before they leave here.

B – Ok.

D – But even the foundational skills have changed in 20 years. The students have changed. 20 years ago most students who would enrol in (this program) would be a person who at home worked on (this stuff at home), you know, maybe dad worked with them in the garage. Nowadays many students don't know (any of it). They don't' get any of that stuff. Until recently – 2 years ago we were able to institute a requirement that the students have to have a driver's license in our program. Before that we'd have students who would enrol in our program who have never driven a car before. Which is a whole different level. You know – teaching them about the 2 pedals and stuff like that. When – 20 years ago that never would have happened. Over the 20 years our learners have changed. Now we're getting more people who have been raised in apartments. They don't know what a screwdriver is. They call somebody if the dishwasher doesn't work.… So. we've got more of that going on. And of course, if you look at how secondary education is going and changed. That has dramatically impacted how post-secondary education goes, especially for us because we have a younger demographic on campus. We typically have THE youngest demographic of all the programs on campus. We get a lot of right-out-of-high-schoolers and they are not… more than ever not prepared for life. So, I know one of your pieces is discussing critical thinking skills…

B – Yes.

D – I have 2 daughters who have recently gone through the public school system, one who just finished last year, and you know, when I look at what they are being asked to do around critical thinking – it's not good. Maybe they are given a research assignment - a web-based research assignment - and here's the website you go to, and here's the information you need to copy down. There is no

thought process involved in that. So what that's done is when they get to us, being able to process an electronically controlled… well just this morning I had two students working (in the lab) out here and they (describes the problem to be solved). So, the way it works is it is being controlled by a computer that is being controlled by another computer, so this computer has to send a message to this computer to be able to operate, right?

B – Ok.

D – So to be able to look at this in a schematic, there is no step by step diagnostic process. They see here's a computer, here's some wires, here's a computer, here's some wires, so they have to be able to think critically to the point of – what is not working, is it getting the correct command – which it was not – so now they have to back up. Now, is this computer getting the correct command and they take a scan tool and plugging it onto a network to try to access the discussion between those two computers and they were not getting the response they were supposed to get. So – that's just that one (scenario). Now if they move over to (another scenario) with a similar (problem) it works completely different… the students aren't prepared to think at that level. When they come in – especially when we get into the electronics sections which my second-year students are in right now, I often hear (the students) say, 'wow I've never had to think this hard.' I always hear them say my brain hurts, I can't think any more about this, my brain is coming out of my head. They say, 'can I google this' and there's no googling of that. So, a lot what we end up doing especially today is just developing thought processes. Even if it's one specific job that they will never see again, just think. Think about it. Think about how things work. How can you apply your knowledge? What's a solution to it? I don't know if it's the standardized testing in high schools or what, but I've seen a definite decline in incoming students' ability to think. There's a huge difference now then there was 20 years ago.

B- And that is something you do on purpose – part of your teaching is just getting them to think.

D – Yes. Absolutely 100%. But it is not specifically called out as 'teaching them to think'. But if we see the opportunity we go after it. It's hard to formalize that or document it, because every person is so different. So, when we see a weak point where someone is not able to think, there is a million different strategies we can employ.

B- How do you identify that? How do you tell when…

D – Ok… so when they are looking at a schematic – this is a schematic (holding up a schematic for me). I'm in electrical right now so I'm thinking schematics…

B – Ok.

D – And you know what I mean by schematic, right? A wiring diagram. So, they're looking at a schematic and I'm saying 'well, if you have 12 volts here and 12 volts here and zero volts here, but they should all be 12, what does that mean? Many people will say there is an open between those two points, right? Whatever is supposed to be connecting those, like in the case of another job they were working on with a resistor. Well if this is 12 and that's 0 then there must be an

opening between there. Often times I'll have a student look at that and say, 'I don't know what that means.' So, then that's a thought process thing. Because they've been taught what a resistor is supposed to do, but they are not thinking it though. So, I will put them back, step back to another situation that I know they know, right? Like, on the whiteboard: ok, here's a lightbulb what should be there, they all know this since we've done it since day one. Sometimes, I haven't done this in about a week, but we have some trainer boards that we use as a transition between the classroom learning and the (lab) learning because we've found that that's quite a leap for many of them, so we have training boards where we can build circuits and fault circuits and run tests so it's not as intimidating as the lab where you can't see everything, but it's beyond just drawing it on the whiteboard. So sometimes when we are out in the lab, and they are forgetting, or not being able to think through a concept, I'll pull them back to where they're comfortable on the training boards and I'll build a circuit with a lightbulb and a wire and I'll say ok this is exactly that, so what's wrong here, now where's the meter test and they'll say well yeah, I see there is an open right here. So, I say ok this is the diagram we were working on, so how is that the same. Some of the people who struggle, they are only going to be able to get to a certain level, whether it's within our industry or at least within our program, and that's ok. Right? And I don't want to… I guess I shouldn't blame this all on what takes place at the secondary level, some of it of course is individuals. And some people – the logical part of their brain, they're able to put those pieces together a little easier than others. But I have definitely seen a decline in their ability to think critically right out of high school. Where we may occasionally have someone who is older, maybe in their 30s, where they are doing a re-training, they often don't have that issue. They may not be an expert, but they can think. They've had a job where they can think critically. Even if it's something like I've spilled something on the floor, what should I do. Right?

B - Is it a 2-year program?

D – It is.

B – Ok. So, when they come in on day one…do you actually see a change before they leave? Do you feel like they are a little more prepared for the world? Like they have some critical thinking skills?

D- I would say yes. Yes.

B - Is there some evolution that happens?

D - 100% yes. Especially in some of the … yes you see a huge growth. And honestly, we see a lot of maturity take place with the younger students. A lot of them get into their second year and maybe discover this isn't the industry choice for them, but around the critical thinking skills, my electrical class alone…what I do… and I'm highlighting this because this is what I'm in right now…probably where you see the biggest challenge is with critical thinking. Right from the beginning I throw some challenging diagrams at them and they can struggle with the simplest thing. The end of the quarter is next Friday and I'm going to show them that same diagram that they were just baffled by the complexity of it and they're just going to be blown away – they do the same thing every year. 'You're kidding me that's the same diagram?' So, you can see the evolution happen, but

some students – they almost flip a switch and suddenly they are able to dramatically increase their ability to critically think around many situations. Other students are maybe not ever going to be able to fully think all these situations through critically. I don't know if I'm making sense.

B- Sometimes it either happens for them or it doesn't?

D- I don't know if I'd go that far. I'd say for some students it really is transformational and for other students there is progress. It's very rare where they are almost unable to think critically. We had one student come through here a couple years ago, who we still talk about, who I think was autistic. And he just couldn't think critically. Even if it was something nuts and bolts. I had something, it was tied on one end and hooked to a chain and there was a thumb wheel on the other end and as you tightened the thumb wheel it made the chain tighter and he could not see that. I said you see how I'm doing this and it's tightening the chain down? And he just could not understand how turning this nut would pull that tighter. Again – those are very rare. He obviously had some kind of a challenge. Mathematically he was a genius, but he just couldn't see it. Other than those instances, the other students, weaker students…there are other factors like are they applying themselves. But in electrical by the time they get to that component in our program, typically we've weeded out the students who are not really motivated or engaged. In (the second year) they are all post-internship so that is another awakening. They understand the relevance of how important the (year two learning) is, so I'd say they all give it strong effort. Unless their life is blowing up, you know, or they are breaking up with their spouse or something like that. We always have stuff going on because they are adult learners. I had a young man in my program who had a baby, so he'd lost some focus. But those are factors. They are adult learners and life is in the way. Money, financial situations and all of the other stressors. So, we try to consider all of that. We're not dealing with high school kids.

B- If they are coming to the program without experience, having worked in a shop at home or anything like that – how do they find you? How are they getting here?

D- Great question. We – the college – works very strongly to expose what we do here especially to the high school level. We do college fairs. We bring high school students here for tour days. Individual program tours. We have recruiting staff that go out. Lots of word of mouth. Lots of people talk about what we do here. So, I would say various ways. By far for our program, primarily they learn about it through the high school. They hear about it. You know that whole social media community, involved in a club or something like that, so the words spreads. And even those students who come to us who are interested in (the trade) and whatnot, it's amazing… it sounds kind of corny, but it's the video games, right? Is where their interest really is. So, when it comes to what's actually happening…how (this trade works, it's not all glamorous). And typically, throughout the first year they start to figure that out. And if I have a student who is maybe needs help figuring that out, I'll Help counsel them to think things through a bit. You know, if you're really not that into this, maybe you should explore some other options.

B- Do you think the high schools are kind of guiding… like is it student driven? The student wants to come to a certain program or is somebody saying suggesting maybe you should look at this or that.

D- Yes. I would say the challenge has been and continues to be nation-wide that it's the student who is struggling academically or had addiction problems or life problems…'you'd be a good mechanic'. The counselling staff, with someone who is doing well academically – 'you need to go to a university'. And unfortunately, those people typically don't succeed because this is such a technical trade. It's very technical and a very high skilled industry. And those people who are sent here by a high school counsellor or a career centre – they have no idea what they are getting themselves into.

B- Do people come thinking this is going to be easy? And then go, 'oh wait a minute'.

D- Some of them do. The older, more mature I should say, are more aware of what they are getting themselves into. One thing I will say is younger people today think a little bit differently about technology. So, they are not surprised that we are talking about Bluetooths and Ethernet and USB ports. The issue is when we get the student who is struggling academically, almost ready to drop out of high school, can't pass a math class, because they don't' care…they don't succeed here because its way to rigorous for them. We still battle that mantra of 'well, Johnny, you're not good with your head, maybe you're good with your hands'. We still struggle with some of that mentality from the high schools. I would say that most of our students that we get here that are successful come here on their own path. We have a number of counsellors that will come through our programs and every time they say, "I had no idea it was this complicated". And every time that happens we see their attitude change. We get many high school counsellors through our county that are younger. They went to university so to them that's college and this is trade school. They aren't trying to purposely harm the program, they are just naive about how things are. If they get (a student) who is a little smarter they say well maybe you should go to the computer side, right – not thinking that we do computer work, software programming, updates, all that stuff just like they would do. So, we still battle that.

B- When does the internship happen?

D – Between the first and second year.

B - Summertime?

D – Yes. And there is more. So, summer is a full-time required internship. They work in a local shop for 8 weeks. All of our local industry is in tune with what is going on with our program. And when I say local – they don't have to stay local. We've had students in many different states. Then when they come back for the second year, they come back only in the morning half and the last half of the day they are on a continued internship. The reason we do that is because often they will make a connection at a job site and we don't' want them to lose that connection. So, they come to school in the morning and we might do – you could say maybe a little more theory based, a little less application and practice because the afternoon is spent at the job site. It's not maybe the perfect

scenario, but what we found out way back when is if you do an internship and then you stop and make them come back to school full time, whatever foot in the door they had is gone. The vast majority of students that graduate our program, they've got a job. They've been going to work, they've been working the whole last year. So, they've already got not only a summer internship, but a whole year's worth of a part time internship. And it seems to really transition better. It's not perfect because they are not there all day, so they don't get to see the full day's experience. But they keep that foot in the door. Which is, you know, at the end of the day we are career oriented. Not necessarily assuming they are going to transfer on – it's more of a terminal degree, if you will, at this point. Not saying – we actually do have some transfer options for some students who choose that path, but that's a very small portion.

B - You talked about seeing the lightbulb come on, or they flipped a switch… and that's after the internship typically?

D- Well gosh, you know … Well, you have four kids – and there are times when say you are making a peanut butter and jelly sandwich and the young kid, all of a sudden you see them get how to use the knife. They are holding it by one end, it's working, they got it… So I can't say that it's the electrical part where I see the lightbulb come on, but I can say that every course that we teach here is another level that they've never had. Next quarter I'm going to be teaching 1st year student who have only completed one quarter with (the other instructor). And that's mostly safety and introduction. So their first real quarter in (the trade) is next quarter with me. I switch back to the first year students.

B- Oh I was going to ask - how the program is laid out?

D - So what we do is every quarter we trade cohorts. I have the first, he has the second and then we switch. It wasn't 100% intentional, but it's kind of nice that way. It refreshes us because we are with a different group, and it refreshes them because they are with a different instructor. Next quarter they'll be through the safety and introduction and a lot of them have never really turned a wrench before. We call it 'turning a wrench'. They've never worked with metal, nuts and bolts and things…they've never really done that. So, I will see multiple lightbulbs coming on next quarter. It's also because they are engaged. They are not only engaged in their learning, but they are actually physically applying their knowledge. Something they don't have enough practice of in actual life application. So, whatever we do we're going over some theory, and then at some point in the near future we are actually going to be applying it in the lab. And when you think about high school and standardized testing and they have to work these formulas, it's rare that the teacher will say, 'you know we're going to be putting some carpet in this classroom and we need to know how many yards of carpet it will take, can you guys figure that out for me? And we need to know in an hour.' You don't see that happen there, but here we force it to happen. They don't have that practice. But here what happens in the electrical section is a very high level of that.
The learning… you know how the – the pyramid and the higher levels of learning…

B – Yes.

D – So, I would say when they get into the second year of learning they are mid-to-upper level. There is some creating they are going to be doing, but there is a lot of analysis. They (the students) have to analyse, they have to articulate their thought processes, because at the end of the day they are selling that to a customer. So, as we go through the program we naturally have the more complex topics at the back end. That's where we see that higher level of critical thinking take place, but I would be remiss if I didn't say it's from day one, when they walk in the door. If I have a student that maybe has more experience, then I'm going to push him or her into that mode of stretching them. I don't' just jump through the hoops. I can see that you know how to do this, solve this problem, so we're going to give you one that you've never done before. Think through this process and think through how to find the information though our information database system. So again, yes absolutely the critical thinking happens in the second year, but all the way to the beginning. Am I answering that question? Your other questions was…

B - Classroom time, shop time, time on tools…

D – Ok. Our program is seven quarters and if you take the summer internship out its six quarters. In the first year, we have the first quarter … let me see if I have the course sequencing grid thing… If you were to look at … this will work… (showing me a piece of paper with the program outline)… look at the way a student goes through here. This is the first quarter and these three courses here are the introductory courses that (the other instructor) is just finishing up with right now. Again, the basics. And the other thing that is unique about this is we include the (other trade) students in this part of the program. Quarter two is where I will be next quarter. It's partially online, partially face to face so it's a hybrid. Um, these courses here are taught hybrid. The reason for that is we are trying to get them to get their general education requirements finished up front if we can, but that puts a 25 credit load on them, which is a lot. But you'll see with the programs here it's common to see a 20 credit quarter… our average quarter is 20 credits. That also puts them at a financial challenge but it's common across the state, which isn't wonderful. Then they get in here and this is basically a full time 8 to 3, 3 hour full contact week mode. (…Papers shuffling…)

B – can I take a picture of this?

D – You can have it.

B – Thank you.

D - So this is the class times, and the rest of it is done as a hybrid. Then when they get down here to their second quarter they are here 8-3 every day. It's not formal but typically we'll do class stuff in the morning. It might be a PowerPoint, but I really try to avoid just the lecture stuff. If you walk down to my classroom we don't sit in rows, it's in a U shape. And all the students have a one-to-one iPad. We do a lot of web-based components. I try to leverage as many engaging tools online as I can. I do a poll-everywhere every morning… it's an on the fly test or survey site. I'll have two or three questions from the day before and I'll send them to their iPad.. They answer, and it populates into a word cloud anonymously. We can see where we are at as a class and there are days where everybody got it and we move on, and there are days when 75% of

the class did not get it and 25% is going how did they not get that and I go well that's a darn good question, how did they not get that, then I go quiet and let them figure it out.

B - Methods you use in your classroom, these teaching methods and you mentioned Maslow's hierarchy - where did you learn them? Did they come from your continuous learning work or are you just figuring it out as you go?

D- All of it. The first exposure, light bulbs coming on for me, was the elements of teaching course 20 years ago. The continuous learning part - we have in-services that we are required to attend while we are here, and I try to take as many when they are offered, engage with as many learning styles. I'm also maybe a little more involved with technology on campus as far as trying to use that in the learning environment. A lot of it is trying to get into other people's classrooms and seeing what works well. I think a lot of us try to do that. (That is) heavily encouraged by the college. I am involved in two people's pre-tenure right now because we have a lot of new faculty on campus. So, I'm sitting in their classes and I'm seeing things that they have brought to the table and I'm thinking 'man that looks like a great idea'. As our administrators rotate as they do they all come in with different ideas and we'll all have a faculty meeting and they'll say, 'hey this is something we used'. So, I just try to figure it out from everywhere and personal research and whatnot. We dabbled in team-based learning– I use components of that today. Where students come in, they are all put on a team, it's essentially a take on the flip classroom model, but when they come in they are accountable to their team as opposed to the whole group and we use the word team intentionally – not group – and they name themselves. And if you do it all the way to the nth degree, then the team members can have some input into the grade of the other team members, so who contributes more, or less. It's group work but it's a team thing and I use components of that My students are in teams, but we don't do it to the letter like the team-based model would. Over the years we've tried different things and I'll also say 100% it depends on the cohort. Some groups are very social, extroverted… you just get that group. And other times you have students where you're just wondering how this group came together. They don't talk, they are not friendly. The current group I have in the second semester - I think they are going to be best friends forever. They hang out on the weekends together, they do everything together.

B - How big are the cohorts?

D - They come in at 24.

B - So 24 new students each year.

D – Yes, then attrition happens. I'm at 18 right now which is probably the bottom end of what our administration is ok with. We've lost six and usually its life stuff. Or they get through e first year and they are like, 'I'm 18 years old and I don't' know what I want to do but this isn't it'. Those things happen but like I said, there are certain cohorts where I don't need to force the teamwork because they just work in teams. I don't know why. They are just good. When there is a challenge or an assignment, they just work together. Wonderful. Learning from a peer is 100% better. One of the things I do when I give a formal assessment – I give it to them individually and then they get into their teams and I re-give it to them as a team. And then we use these scratch offs here. Let's say

it's a 10-question quiz or something like that…if I've done it A, B, C, D…which is not the best way but it's great for discussion the way I use it so let's say 10 questions…They'll do the quiz and put in online through our OEM. I do not give them their scores. Then I will give it to them again on paper with their teams, then we'll have a little contest with these scratch-offs and let's say the first one the correct answer is C but they scratch B it will be blank under there. Then they scratch C and there is a star. So, if they find the star they got it right and at the end they total up their score. Whichever team has the high score they get to grab from a bag, I have a bag… a swag bag with stuff I've collected from all over the place. And they just love that, pulling out of the bag a ruler or a pen…

B - You don't outgrow liking prizes.

D - never outgrow liking prizes and you never outgrow envying the other guys prize…(laughter) and they can always trade it in for a hat. I've got stacks of hats, that kind of stuff. It's a fun competition but what I love is I am silent, and they are learning from each other. 'Why would you say that's B?' They talk it though. And especially in the first year I bring it back to looking at your team score and looking at your individual score and seeing how much better you are as a team – collaborating, reaching out, working together. And I really put a lot of that in the first year to help them see the importance. In the second year, hopefully they work as a team. Sometimes the groups of students just don't' work together, but those are the bad ones we don't' want to talk about those (mumbling and laughter).
In winter and spring they are on campus 8-3 face to face every day. The more nuts and bolts mechanical stuff happened in the first year, more kinesthetic, get your hands on it, probably better for the visual learner. All the way thru the 1st year then we have the internship in the summer. And the second year I would say is more complex topics so in the second year, like today we did an hour of classroom stuff and they were in the lab for essentially two hours. Some days they may be in the classroom for two hours. And when I say in the class I don't' mean dry lecture, but often doing things together as one group. And when I say in the lab I mean actually (working the trade). So, in the first year where we have them 8:00a-3:00p, the morning is closer together. Maybe were doing a demo, maybe we're working on trainers and then the afternoon I more open lab time where we have actual orders we are working on. That's the normal mix.

B - I've already taken up your hour, but I have two quick questions, if I may… is there a common theme or mission that comes from the president and trickles through every department as far as teaching and learning styles?

D - There is a college mission, and goals.

B - Are the goals specific to each department? Do you get to make yours?

D - No. Let me grab them. We have to have them posted everywhere. This is not for our program, they are campus wide.

B - Is there some time when you get together with all the other instructors and learn how to facilitate this? (holding the campus mission and goals)

D - Yes – between you and me, often times it's just jumping through hoops.

B - I understand.

D – Now, we do have individual course outcomes. We have a program outcomes report that we have to do once a year. Our current administration has said this is a valuable tool that we are jumping through for our accreditation… they are looking at graduate data and job placement data and coming back to our individual program outcomes – are we reaching that. I kind of forgot about that because it's been a hoop jump in the past. It's not a guiding document that it should or could be. It's an unwritten… 'we are all of one mind'. At the end of the day we are all trying to develop these students for a career option. That is something we are going to be developing, but we are a close team here. We all have lunch together every day. We are all on the same page. Twice a year we are in an Advisory Committee meeting with local representatives from our industry and that is how we ensure we are staying on the correct path. Those meetings are when our customers come in and tell us if we are producing what they need. Our dean is always at the advisory meetings. And if they say you know you guys are spending all this time talking about this, which is great, but we don't work on this. What we really need is a skill set in that, or whatever they say – that holds a lot of weight and we will be held accountable to that through our dean and our vice president of instruction. Especially through a program review if it's called out that we are off base. We've never had here, but others have. The dean and VP will really get in there and confirm out outcomes match what the industry is asking for. So, you know, I'm sure there is on paper a formal process, but that is how the real world of it works. Between us and our advisory committee that is how we ensure we are on path. The mission of our program or the bigger mission of the college is the mission of a technical college and ensures we don't' creep into the community college. This is a weird community because the community college is right over there and many of the faculty feel very strongly that they do their thing and we do our thing.

B - I was interested when they started putting English and humanities into the programs here.

D – Right. We've always had 3 required gen-eds – that's required by the state – to get the Associates degree, which is what my students leave with - an Associates of Applied Science degree. You have to have the three gen-eds. Now, if my students take the transfer option, that adds a couple more gen-eds on there. However, the search within our system which is community colleges and technical colleges, one of the big pushes and the big barrier that has been shot down is the ability for us to offer four-year degrees. Because the (universities) of the world said that we are the degree granting institutions of the world and the community and technical colleges are the two-year transfer degree granting institutions. Four years ago, that barrier was taken down. Four years ago, (another technical college) was the first one to offer a bachelor's degree and now we have two four-year degrees. We have three bachelor's degree programs. One of the options we have here is you can obtain a two-year degree like through this program, then you can tack on a bachelor's in project management or something. Our engineering program has a four-year option, and nursing. So that is causing some conflict in the system about our mission…are we a bachelor's granting institution or are we a career training institution? And unfortunately, with the cost of all our programs… you know if this building here was filled with eight English classes there would be much more profit. The cost

to operate our program is phenomenal… tooling, equipment, the shop maintenance, the size of the facility. So the financial part – since we are competing for the same dollar as the English department at (the local community college) out of (the state capital), there can be conflicts since we are all funded on the same level. It has been said many times the technical programs need to be funded at a different FTE rate but it's all the same. So naturally for us to stay financially viable, we've had to increase our gen-ed options because gen-eds are high profit. It's a state-wide thing, not a (our college) thing. Twenty years ago, our state funding was 75-80 % of our annual budget, and now it's like 40 %. We are allowed to keep more tuition dollars here than we were before. We have the local funds from the students, but we have to really reach out – grants, wherever the funding is coming from to keep programs afloat. And we are very comfortable at this college compared to some of the others. (Other schools) are having serious financial problems and it comes back to the cost of these programs. To keep these programs running is such a high cost relative to English classes, but we're all funded the same. The last president said, 'I love these programs. This is where my heart is, but I don't' see how this is financially viable.' We were going into a recession and he said he had to move on, and he went to a community college in (a different city). He said, 'I don't see how you guys are going to stay afloat unless you merge with (the community college)'. That was discussed for years. The state board discussed merging us together. So there is only one president, not two, and so on. All that to say we are at this weird stage with our mission. But at this time, it is still the career technical professional education that is really at the core of what we do.

B - I was wondering if you have ever heard of transformative learning theory.

D - I have. Transformative learning theory…I have heard that term. Probably one of the education courses I've taken.

B – I'm looking for evidence of transformative practices in technical education. When I worked with my brother during summers as an electrician apprentice, I witness some of the negative attitudes towards trade workers, and I thought if TLT applies and is present here, maybe that is a step in the right direction.

D - Do you follow Mike Rowe? Do you follow what he is doing with his foundation? The reason I bring up Mike Rowe is he is becoming quite a voice. He talks about his poster on the wall with a greasy mechanic and a guy with a tassel. His high school counsellor sent him on a path he didn't want. He re-created that poster as the exact opposite. He is creating some waves. He said when you are in school everyone gets told everyone can be the president. But not everybody can be president, and not everybody can be a mechanic. So, follow your passion, but know the difference between a career and a hobby. The message I send kids on career day is what really interests you? And I flip it because it works both ways, if you're not into (this trade), you shouldn't be in this program. If putting your hands in someone else's mouth grosses you out, don't go into dental.

B – I will definitely have a look. Thank you so much for your time.

References

ACTE (2019) Association for Career and Technical Education, 'Mission', retrieved from acteonline.org/about/acte-mission-standards/ (last accessed 23 April 2020).

Advance CTE (2019) 'About CTE', from Advance CTE, online posting, retrieved from careertech.org/CTE, (last accessed 23 April 2020).

Alexander, C. (2018) 'Why you should raise your kids to be plumbers', in *Alereia*, 20 June 2018, online posting, retrieved from https://aleteia.org/2018/06/20/why-you-should-raise-your-kids-to-be-plumbers/ (last accessed 27 August 2019).

Alman, S.W., Frey, B.A., Tomer, C. (2012) 'Social and cognitive presence as factors in learning and student retention: An investigation of the cohort model in an iSchool setting', in J*ournal of Educational for Library and Information Science*, vol. 53, no. 4. Pp. 290-302.

Ammons, M. (1964) 'Purpose and program: How does commitment today differ from that in other periods', in *Educational Leadership*, October 1964, retrieved from ascd.org/ASCD/pdf/journals/ed_lead/el/_196410_ammons.pdf (last accessed 23 April 2020).

Apte, J. (2009) 'Facilitating transformative learning: A framework for practice', in *Australian Journal of Adult Learning*, vol. 49, no. 1, pp. 169-189.

Armbrecht, T. (2018) 'Engaging adult learners, Part II: In-class activities inspired by transformative learning', from Room 241: A blog by Concordia University-Portland, online posting, retrieved from https://education.cu-portland.edu/blog/classroom-resources/transformative-teaching-adult-learners/ (last accessed 27 August 2019)

Association of American Colleges and Universities (n.d.) 'What is liberal education', online posting, retrieved from https://www.aacu.org/leap/what-is-liberal-education (last accessed 2 September 2019).

Attitude (2020) In Merriam-Webster.com, retrieved from https://www.merriam-webster.com/dictionary/attitude (last accessed 4 March 2020).

Attride-Stirling, J. (2001) 'Thematic networks: An analytical tool for qualitative research', in *Qualitative Research*, vol. 1, no. 3, pp. 385-405, DOI: 10.1177/146879410100100307

Baker, J.D. (2016) 'The purpose, process, and methods of writing a literature review', in *AORN Journal*, 26 February 2016, DOI 10.1016/j.aorn.2016.01.016.

Barrow, O. (2013) 'Ohio's construction industry sees shortage of skilled workers', in *The Dayton Business Journal*, 5 September 2013, online posting, retrieved from http://www.bizjournals.com/dayton/blog/morning_call/2013/09/ohios-construction-industry-sees.html (last accessed 1 October 2013).

Baumgartner, L.M. (2012) 'Mezirow's theory of transformative learning from 1975 to present' in E.W. Taylor and P. Cranton (eds.), *The Handbook of Transformative Learning: Theory, Research, and Practice*, San Francisco, CA, Jossey-Bass, pp. 99-115.

Beck, C. and Kosnik, C. (2001) 'Reflection-in-Action: In defense of thoughtful teaching' in *Curriculum Inquiry*, vol. 31, no. 2, pp. 217-227. DOI: 10.1111/0362-6784.00193.

Biggs, J. (1999) 'What the student does: Teaching for enhanced learning', in *Higher Education Research and Development*, vol. 18, no. 1, pp. 57-75. DOI: 10.1080/0729436990180105.

Blinder, A. (2006) 'Offshoring: The next industrial revolution?', in *Foreign Affairs*, vol. 85, no. 2, pp. 113-128, DOI: 10.2307/20031915

Boud, D. (2001) 'Using journal writing to enhance reflective practice', in L.M. English and M.A. Gillen (eds.), *New Directions for Adult and Continuing Education: Promoting Journal Writing in Adult Education*, no. 90, San Francisco, Jossey-Bass, pp. 9-18.

Boud, D. (2010) 'Relocating reflection in the context of practice', in H. Bradbury, N. Frost, S. Kilminster and M. Zukas (eds.), *Beyond Reflective Practice*, New York, Routledge, pp. 25-36.

Bourhis, J. (2018) 'Narrative literature review', in M. Allen (ed.) *The SAGE Encyclopedia of Communication Research Methods*, Thousand Oaks, CA, SAGE Publications, pp. 1076-1077, DOI: 10.4135/9781483381411

Brady, J.T. (1999) 'My son, the technician…', in *Tech Directions*, vol. 58, no. 7, p 41.

Braun. V. and Clarke, V. (2006) 'Using thematic analysis in psychology', in *Qualitative Research in Psychology*, vol. 3, no. 2, pp. 77-101, DOI: 10.1191/1478088706qp063oa

Braun, V. and Clarke, V. (2014) 'What can "thematic analysis" offer health and wellbeing researchers?', in *International Journal of Qualitative Studies on Health and Wellbeing*, vol. 9, no. 1, DOI: 10.3402/qhw.v9.26152

Briggs, S. (2015) 'Five big things that transformational teachers do', from informED, 11 November 2015, online posting, retrieved from https://www.opencolleges.edu.au/informed/features/4-big-things-transformational-teachers-do/ (last accessed 26 August 2019).

Brock, S.E. (2010) 'Measuring the importance of precursor steps to transformative learning', in *Adult Education Quarterly*, vol. 60, no. 2, pp. 122-142 DOI: 10.1177/0741713609333084

Brookfield, S.D. (1994) 'Self-directed learning', from YMCA George Williams College ICE301 Lifelong learning, Unit 1 Approaching Lifelong Learning. London, YMCA George Williams College. Available in the informal education archives,

retrieved from http://infed.org/mobi/self-directed-learning/ (last accessed 11/08/2019).

Brookfield, S. D. (1995) *Becoming a Critically Reflective Teacher*, San Francisco, CA, Jossey-Bass.

Brookfield, S. (2009a) 'Engaging critical reflection in corporate America', in J. Mezirow and E.W.Taylor (eds), *Transformative Learning in Practice: Insights from Community, Workplace, and Higher Education*, San Francisco, CA, Jossey-Bass, pp. 125-135.

Brookfield, S.D. (2009b) 'Self-directed learning', in R. Maclean and D. Wilson (eds.), *International Handbook of Education for the Changing World of Work*, Springer Science+Business Media, pp. 2615-2627, DOI: 10.1007/978-1-4020-5281-1_XV.7

Caffarella, R.S. and O'Donnell, J.M. (1987) 'Self-directed adult learning: A critical paradigm revisited', in *Adult Education Quarterly*, vol. 37, no. 4, pp. 199-211. DOI 10.1177/0001848187037004002.

Caldwell, C. (2012) 'State promotes skilled trades as an alternative to college', from *Atlanta Business Chronicle*, 21 March 2012, online posting, retrieved from bizjournals.com/atlanta/morning_call/2013/03/state-promotes-skilled-trades-as.html (last accessed 24 April 2020).

Carter, T.J. (2017) 'Class 6 intro to Mezirow's transformational learning theory', 14 June 2017, online posting, retrieved from slideshare.net/tjcarter/class-6-intro-to-mezirows-transformative-learning-theory (last accessed 1 September 2019).

Castles, J. (2004) 'Persistence and the adult learner', in *Active Learning in Higher Education*, vol. 2, no. 2, pp. 166-179, DOI: 10.1177/1469787404043813

Catri, D.B. (1998) 'Vocational education's image for the 21st century', ERIC Digest no. 188, in ERIC Clearinghouse on Adult, career, and Vocational Education, retrieved from www.calpro-online.org/eric/docs/dig188.pdf (last accessed 27 August 2019).

Caverly, D.C., Nicholson, S.A., Battle, J. and Atkins, C.E. (2008) 'Techtalk: Web 2.0, Blogs, and Developmental Education', in *Journal of Developmental Education*, vol. 32, no. 1, pp. 34-35, retrieved from https://www.jstor.org/stable/42775654 (last accessed 15 July 2019).

Cherry, K. (2019) 'The five levels of Maslow's hierarchy of needs', from verywellmind, 21 July 2019, online posting, retrieved from https://www.verywellmind.com/what-is-maslows-hierarchy-of-needs-4136760 (last accessed on 4 September 2019).

Christie, M., Carey, M., Robertson, A. and Grainger, P. (2015) 'Putting transformative learning theory into practice', in *Australian Journal of Adult Learning*, vol. 55, no. 1, pp. 9-30.

Clarke, V. and Braun, V. (2013) 'Teaching thematic analysis', in *The Psychologist*, vol. 26, no. 2, pp. 120-123, retrieved from http://thepsychologist.bps.org.uk/volume-26/edition-2/methods-teaching-thematic-analysis (last accessed 27 August 2019).

Clarke, V. and Braun, V. (2017) 'Thematic analysis', in *The Journal of Positive Psychology*, vol. 12, no. 3, pp 297-298, DOI: 10.1080/17439760.2016.1262613

Cobb, J. (2019) '15 ways of the successful self-directed learner', from Mission to Learn, updated 13 May 2019, online posting, retrieved from https://www.missiontolearn.com/self-directed-learning-success/ (last accessed 12/08/2019).

Coker, P. (2010) 'Effects of an experiential learning program on the clinical reasoning and critical thinking skills of occupational therapy students', in *Journal of Allied Health*, vol. 39, no. 4, pp. 280-286.

Cranton, P. (1996) 'Types of group learning', in S. Imel (ed.) *New Directions for Adult and Continuing Education*, No. 71, pp.25-32, DOI: 10.1002/ace.36719967105

Cranton, P. (2009) 'From tradesperson to teacher: A transformative transition', in J. Mezirow and E.W.Taylor (eds.), *Transformative Learning in Practice: Insights from Community, Workplace and Higher Education*, San Francisco, CA, Jossey-Bass, pp. 182-190.

Cranton, P. (2012) 'Spiraling into transformative learning' in Victor C.X. Wang (ed.), *Vocational Education Technologies and Advances in Adult Learning: New Concepts*, Hershey, Pennsylvania, IGI Global, pp. 1-10, DOI: 10.4018/978-1-4666-0252-6.ch001

Cranton, P. (2016) *Understanding and Promoting Transformative Learning*, Sterling, VA, Stylus Publishing, LLC.

Cranton, P. and Taylor, E.W. (2012) 'Transformative learning theory: Seeking a more unified theory', in E.W. Taylor and P. Cranton (eds), *The Handbook of Transformative Learning: Theory, Research and Practice*, San Francisco, CA, Jossey-Bass, pp. 3-20.

Cranton, P. and Wright, B. (2008) 'The transformative educator as learning companion', in *Journal of Transformative Education*, vol. 6, no. 1. Pp. 33-47, DOI: 10.1177/1541344608316961

Crawford, M.B. (2009) *Shop Class as Soulcraft: An Inquiry into the Value of Work*, New York, Penguin.

Daffron, S.R. and North, M.W. (2011) *Successful Transfer of Learning*, Malabar, Florida, Krieger Publishing Company.

Dalla-Camina, M. (2018) 'The reality of imposter syndrome' in *Psychology Today*, 3 September 2018, online posting retrieved from https://www.psychologytoday.com/us/blog/real-women/201809/the-reality-imposter-syndrome (last accessed 5 March 2020).

de Lange, N., Pillay, G. and Chikoko, V. (2011) 'Doctoral learning: A case for a cohort model of supervision and support', in *South African Journal of Education*, vol. 31, no. 1, pp. 15-30.

Dewey, J. (1910) *How We Think*, New York, Barnes & Noble, Inc.

Dewey, J. (1933) *How We Think: A Restatement of the Relationship of Reflective Thinking to the Education Process*, Lexington, Heath and Company.

Dewey, J. (1934) 'Individual psychology and education', in *The Philosopher*, vol. XII, pp. 1-6, retrieved from http://www.the-philosopher.co.uk/2016/08/individual-psychology-and-education-1934.html (last accessed on 7 September 2019).

Dewey, J. (1938) *Experience and Education*, New York, Touchstone.

Dirkx, J.M. (1998) 'Transformative learning theory in the practice of adult education: An overview', in *PAACE Journal of Lifelong Learning*, vol. 7, pp 1-14.

Dirkx, J. (2001) 'Images, transformative learning and the work of the soul,' in *Adult Learning*, vol. 12, no. 3, pp. 15-16.

Dubin, J. (2014) 'Keeping it real: A Toledo public school prepares students for college and career', in American Educator, vol. 38, no. 3, pp. 19-23.

Edet, B. (2013) 'Nigeria: Poor public perception slows tech, vocational education minister', in All Africa, 14 March 2013, online posting, retrieved from https://allafrica.com/stories/201303140414.html (last accessed 27 August 2019).

Elias, J.L. and Merriam, S.B. (2005) *Philosophical Foundations of Adult Education*, Malabar, Florida, Krieger Publishing Company.

Figueroa, M. (2015) 'What if relationships were the alternative?', in C. Pozniak, J. Rose, and M. Wall (eds.) *Sparks: Igniting Transformation in Education for all Students*, Columbia, SC, Ed.L.D. Cohort 5, pp. 58-73.

Fook, J. (2010) 'Beyond reflective practice: Reworking the 'critical' in critical reflection', in H. Bradbury, N. Frost, S. Kilminster and M. Zukas (eds.), *Beyond Reflective Practice*, New York, Routledge, pp. 37-51.

Foshay, A.W. (1991) 'The curriculum matrix: Transcendence and mathematics', in *Journal of Curriculum and Supervision*, vol. 6, no. 4, pp. 277-293, retrieved from http://www.ascd.org/ASCD/pdf/journals/jcs/jcs_1991summer_foshay.pdf (last accessed 7 September 2019).

Freire, P (1970) *Pedagogy of the Oppressed*, New York, Herder and Herder.

Freire, P. (2000) *Pedagogy of the Oppressed*, 30th Anniversary Edition, New York, Continuum.

Gale Group (1997) 'What do people think of us?: A Techniques survey of parents finds strong support for Vocational-Technical Education – but confirms that some myths persist', in Techniques, vol. 72, no. 6.

Gay, L.R., Mills, G.E. Airasian, P. (2009) *Educational Research: Competencies for Analysis and Applications*, New Jersey, Pearson Education, Inc.

Geremew, T. (2018) 'The social perception of technical and vocational education and training in Ethiopia: A critical review', in *International Journal of Research Publications*, vol. 3, no. 1, DOI: 100315201882

Gholami, K. and Tirri, K. (2012) 'caring teaching as a moral practice: An exploratory study on perceived dimensions of caring teaching', in *Education Research International*, vol. 2012, article 954274, 8 pgs. DOI: 10.1155/2012/954274.

Glisczinski, D.J. (2007) 'Transformative higher education: A meaningful degree of understanding', in *Journal of Transformative Education*, vol. 5, no. 4, pp. 317-328, DOI: 10.1177/1541344607312838

Gordon Rouse, K.A. (2001) 'Resilient students' goals and motivation', in *Journal of Adolescence*, vol. 24, pp. 461-472. DOI: 10.1006/jado.2001.0383

Gray, K. (1997) 'The gatekeepers', in *Techniques: Making Education and career Connections*, vol. 72, no. 1, pp. 24-28.

Gray, K. and Bae, S.H. (2009) 'Skills shortages, over-education and unemployed youth: An international dilemma', in R. Maclean and D. Wilson (eds.), *International Handbook of Education for the Changing World of Work*, Springer Science+Business Media, pp. 2211-2228, DOI: 10.1007/978-1-4020-5281-1_XIII.2

Great Schools Partnership (2014) 'Career and technical education', from The Glossary of Education Reform, retrieved from https://www.edglossary.org/career-and-technical-education/ (last accessed 31/07/2019).

Green, B.N., Johnson, C.D. and Adams, A. (2006) 'Writing narrative literature reviews for peer-reviewed journals: Secrets of the trade', in *Journal of Chiropractic Medicine*, vol. 5, no.3, pp. 101-117, DOI: 10.1016/S0899-3467(07)60142-6

Green, K. (2016) 'The education system needs a transformation. Career technical education can help', from RealClearEducation, 1 June 2016, online posting, retrieved from https://www.realcleareducation.com/articles/2016/06/01/the_education_system_needs_a_transformation_career_technical_education_can_help_1292.html (last accessed 9 June 2019).

Gross, A. and Marcus, J. (2018) 'High-paying trade jobs sit empty, while high school grads line up for university', from NPR.org, 25 April 2018, online posting, retrieved from https://www.nrp.org/sections/ed/2018/04/25/605092520/high-paying-trade-jobs-sit-empty-while-high-school-grads-line-up-for-university (last accessed 9 June 2019).

Guglielmino, L.M. (1977) 'Development of the self-directed learning readiness scale'. Unpublished doctoral dissertation. University of Georgia.

Habermas, J. (1971) *Knowledge and Human Interests*, J. Shapiro (trans.), Boston, Beacon Press.

Habermas, J. (1984) *The Theory of Communicative Action: Reason and the Rationalization of Society*, T. McCarthy (trans.), Boston, Beacon Press.

Hall, M. (2013) 'Flipping your class' from The Innovative Instructor Blog, 23 january 2013, online posting, retrieved from https://ii.library.jhu.edu/tag/inverted-classroom/ (last accessed 4 March 2020).

Halupa, C. (2017) 'Are students and faculty ready for transformative learning?', in J.M. Spector, B.B. Lockee and M.D. Childress (eds.), *Learning, Design, and Technology*, Switzerland, Springer International Publishing, pp. 1-24, DOI: 10.1007/978-3-319-17727-4_70-1

Haney, R.M. (2002) 'Secondary student perceptions of vocational education', Dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Education in Educational Leadership, University of North Florida, College of Education and Human Services, in UNF Digital Commons, retrieved from https://digitalcommons.unf.edu/etd/181/ (last accessed 27 August 2019).

Hanford, E. (2014) 'The troubled history of vocational education', in *American RadioWorks*, 9 September 2014, online posting, retrieved from http://www.americanradioworks.org/segments/the-troubled-history-of-vocational-education/ (last accessed 27 August 2019).

Hart, C. (1998) *Doing a Literature Review: Releasing the Social Science Research Imagination*, Thousand Oaks, CA, SAGE Publications Ltd.

Holzer, H.J., Linn, D. and Monthey, W. (2013) 'The promise of high-quality career and technical education: Improving outcomes for students, firms, and the economy', from Center on poverty, Inequality & Public Policy, Georgetown Law, retrieved from http://sdlcillinois.org/constitution/georgetown.pdf (last accessed 27 August 2019).

Jack, I. (2009) 'Would you want your son to be a plumber?: Our rush to embrace higher education has started to become economically destructive', in *The Guardian*, 5 December 2009, p. 31.

Jackson, J.H. and Hasak, J. (2014) 'Look beyond the label', in *American Educator*, vol. 28, no. 3, p. 34-39, retrieved from https://www.aft.org/periodical/american-educator/fall-2014 (last accessed 27 August 2019).

Jahan, N., Naveed, S., Zeshan, M. and Tahir, M.A. (2016) 'How to conduct a systematic review: A narrative literature review', in *Cureus*, vol. 8, no. 11, DOI: 10.7759/cureus.864

Jordan, J. and Dechert, K. (2012) 'Public perception of career and technical education in Mississippi', from Mississippi State University Research and Curriculum unit, in conjunction with the Mississippi Department of Education, retrieved from https://www.rcu.msstate.edu/Portals/0/Reports/Perceptionsreport_issuu.pdf (last accessed 27 August 2019).

Josselson, R. (2013) *Interviewing for Qualitative Inquiry: A Relational Approach*, New York, The Guilford Press.

Kasim, E.S. and Fachriah, T, (2018) 'Public perception of vocational education', in The 2nd International Conference on Vocational Education (ICVHE) 2017 "The Importance of Advancing Vocational Education to Meet Contemporary Labor Demands", KnE Social Sciences, pp. 293-310, DOI: 10.18502/kss.v3i11.2768

Kasworm, C. (2008) 'Emotional challenges of adult learners in higher education', in *New Directions for Adult and Continuing Education*, no. 120, pp. 27-34, DOI: 10.1002/ace.313

Kavilanz, P. (2012) 'Nine months in trade school. Job guaranteed.', in *CNN Money*, 23 July 2012, online posting, retrieved from http://money.cnn.com/2012/03/14/smallbusiness/trade-schools/index.htm (last accessed 1 October 2013).

Kear, T.M. (2009) 'An investigation of transformative learning experiences during associate degree nursing education using narrative methods', Dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, College of Nursing, Villanova University, December 2009, retrieved from https://pqdtopen.proquest.com/doc/880545169.html?FMT=ABS (last accessed 25 August 2019).

Kear, T.M. (2013) 'Transformative learning during nursing education: A model of interconnectivity', in *Nurse Education Today*, vol. 33, no. 9, pp. 1083-1087, DOI: 10.1016/j.nedt.2012.03.016

Kerka, S. (2000) 'Career and technical education: A new look. In brief: Fast facts for policy and practice no. 8', a guide sponsored by the Office of Vocational and Adult Education, Washington D.C., by the National Dissemination Center for Career and Technical Educaion, Columbus OH, retrieved from https://files.eric.ed.gov/fulltext/ED448319.pdf (last accessed 27 August 2019).

King Jr, M.L. (1947) 'The purpose of education', Morehouse student college paper, retrieved from mlkonline.net/the_purpose_of_education.html, (last accessed 23 April 2020).

Kitchenham, A. (2008) 'The evolution of John Mezirow's Transformative Learning Theory', in *Journal of Transformative Education*, vol. 6, no. 2, pp. 104-123, DOI: 10.1177/1541344608322678

Kivunja, C. and Kuyini, A.B. (2017) 'Understanding and applying research paradigms in educational contexts' in *International Journal of Higher Education*, vol. 6, no. 5, pp. 26-41.

Knowles, M.S. (1975) *Self-directed Learning: A Guide for Learners and Teachers*, New York, Cambridge Books.

Knowles, M.S. (1980) The Modern Practice of Adult Education: From Pedagogy to Andragogy, New Jersey, Cambridge Adult Education.

Knowles, M.S. (1984) *Andragogy in Action: Applying Modern pronciples of Adult Education*, San Francisco,Jossey Bass.

Knowles, M.S. (1990) *The Adult Learner: A Neglected Species*, 4th Edition, Houston, Texas, Gulf Publishing Company.

Komori, M. (n.d.) 'Thematic analysis', from Research Design Techniques, online posting, retrieved from http://designresearchtechniques.com/casestudies/thematic-analysis/ (last accessed 27 August 2019).

Kopka, T.L.C. and Peng, S.S. (1993) 'Adult education: Main reasons for participating', Washington DC: National Center for Educational Statistics, Office of Educational Research and Improvement, US Department of Education.

Korp, H. (2011) 'What counts as being smart around here? The performance of smartness and masculinity in vocational upper secondary education', in Education, Citizenship and Social Justice, vol. 6, no. 1, pp.21-37. DOI: 10.1177/1746197910397909.

Kreber, C. (2012) 'Critical reflection and transformative learning', in E.W. Taylor and P. Cranton (eds.), *The Handbook of Transformative Learning: Theory, Research, and Practice*, San Francisco, CA, Jossey-Bass, pp. 323-341.

Lavrysh, Y. (2015) 'Transformative learning as a factor of lifelong learning by the example of vocational education in Canada', in *Comparative Professional Pedagogy*, vol. 5, pp. 62-67, DOI: 10.1515/rpp-2015-0067

Lawrence, R.L. (2012) 'Transformative learning through artistic expression: Getting out of our heads', in E.W. Taylor and P. Cranton (eds.), *The Handbook of Transformative Learning: Theory, Research, and Practice*, San Francisco, CA, Jossey-Bass, pp. 471-485.

Lucas, N. (2009) '14-16 year olds taking vocational courses in English colleges: A dumping ground for the disengaged or a real alternative?', in R. Maclean and D. Wilson (eds.), *International Handbook of Education for the Changing World of Work*, Springer Science+Business Media, pp. 2343-2356, DOI: 10.1007/978-1-4020-5281-1_XIII.10

Magro, K. (2009) 'Transformative learing theory and TVET', in R. Maclean and D. Wilson (eds.), *International Handbook of Education for the Changing World of Work*, Springer Science+Business Media, pp. 2661-2677, DOI: 10.1007/978-1-4020-5281-1_XV.10

Maguire, M. and Delahunt, B. (2017) 'Doing a thematic analysis: A practical step-by-step guide for learning and teaching scholars', in *All Ireland Journal of Teaching and Learning in Higher Education*, vol. 9, no. 3, pp. 1-14, retrieved

from http://ojs.aishe.org/aishe/index.php/aishe-j/article/view/335/553 (last accessed 27 August 2019).

Mandell, A. and Herman, L. (2009) 'Mentoring: When learners make the learning', in J. Mezirow and E.W.Taylor (eds), *Transformative Learning in Practice: Insights from Community, Workplace, and Higher Education*, San Francisco, CA, Jossey-Bass, pp. 78-88.

Martin, A. (2002) 'Motivation and academic resilience: Developing a model for student enhancement', in *Australian Journal of Education*, vol. 6, no. 1, pp. 34-49, retrieved from https://go-gale-com.ezproxy.lib.gla.ac.uk/ps/i.do?p=EAIM&u=glasuni&id=GALE|A91563893&v=2.1&it=r&sid=summon (last accessed 4 march 2020).

Marton, F. and Säljö, R. (1976) 'On qualitative differences in learning: Outcome and process', in *British Journal of Educational Psychology*, vol. 46, pp. 4-11.

Mayo, P. (2003) 'A rationale for a transformative approach to education', in *Journal of Transformative Education*, vol. 1. No. 1, pp. 38-57, DOI: 10.1177/1541344602250400

McCall, K. (2018) 'Effects of transformational learning on student nurses' perceptions and attitudes of caring for dying patients', Dissertation submitted in partial fulfillment of the requirement for the degree of doctor of philosophy Nursing Education, College of Health Sciences, Walden University, May 2018, retrieved from https://pdfs.semanticscholar.org/7535/b6b3eef0ffde3e49625b34d32908ad268ae4.pdf (last accessed 27 August 2019).

McGonigal. K. (2005) 'Teaching for transformation: From learning theory to teaching strategies', in *Speaking of Teaching: The Center for Teaching and Learning, Spring 2005 Newsletter*, Stanford University, vol. 14, no. 2.

Merriam, S.B. (2001) 'Andragogy and self-directed learning: Pillars of adult learning theory', in S. Merriam (ed.), *New Directions for Adult and Continuing Education*, vol. 2001, issue 89, San Francisco, Jossey-Bass, pp. 3-14, DOI: 10.1002/ace.3

Merriam, S.B. and Brockett, R.G. (2007) *The Profession and Practice of Adult Education: An Introduction*, San Francisco, CA, Jossey-Bass.

Merriam, S.B., Caffarella, R.S., and Baumgartner, L.M. (2007) *Learning in Adulthood*, San Francisco, CA, Jossey-Bass.

Merriam, S.B. and Kim, S. (2012) 'Studying transformative learning: What methodology?', in E.W. Taylor and P. Cranton (eds.), *The Handbook of Transformative Learning: Theory, Research, and Practice*, San Francisco, CA, Jossey-Bass, pp. 56-72.

Mezirow, J. (1975) *Education for Perspective Transformation: Women's Re-entry Programs in Community Colleges*, New York: Center for Adult Education, Teachers College, Columbia University.

Mezirow, J. (1985) 'A critical theory of self-directed learning', in S. Brookfield (ed.), *Self-Directed Learning: From Theory to Practice, New Directions for Continuing Education* No. 25, San Francisco, Jossey-Bass, pp. 17-30.

Mezirow, J. (1991) *Transformative Dimensions of Adult Learning*, San Francisco, CA, Jossey-Bass.

Mezirow, J. (1997) 'Transformative learning: Theory to practice', in P Cranton (ed) *New Directions for Adult and Continuing Education*, vol. 1997, no. 74, San Francisco, Jossey-Bass, pp. 5-12.

Mezirow, J. (2009) 'Transformative learning theory', in J. Mezirow and E.W.Taylor (eds), *Transformative Learning in Practice: Insights from Community, Workplace, and Higher Education*, San Francisco, CA, Jossey-Bass, pp. 18-32.

Mezirow, J. (2012) 'Learning to think like an adult: Core concepts of transformation theory', in E.W. Taylor and P. Cranton (eds.), *The Handbook of Transformative Learning: Theory, Research, and Practice*, San Francisco, CA, Jossey-Bass, pp. 73-96.

Moore, J. (2005) 'Is higher education ready for transformative learning? A questions explored in the study of sustainability', in *Journal of Transformative Education*, vol. 3, no. 1, pp. 76-91, DOI: 10.1177/1541344604270862

Morrow, S.L. (2005) 'Quality and trustworthiness in qualitative research in counseling psychology', in *Journal of Counseling Psychology*, vol. 52, no. 2, pp. 250-260, DOI: 10.1037/0022-0167.52.2.250

Morstain, B.R. and Smart, J.C. (1974) 'Reasons for participation in adult education courses: A multivariate analysis of group differences', in *Adult Education*, vol. 24, no. 3, pp. 83-98.

NASEM (2018), National Academies of Sciences, Engineering, and Medicine. How People Learn II: Learners, Contexts, and Cultures, Washington DC, The national Acedemies Press. doi: https://doi.org/10.17226/24783

Nasri, N.M. (2017) 'Self-directed learning through the eyes of teacher educators', in *Kasetsart Journal of Social Sciences* (2017), http://dx.doi.org/10.1016/j.kjss.2017.08.006.

Nguyen, J. (2016) 'On reasons we want teachers to care', in *Ethics and Education*, vol. 11, no. 3, pp. 286-298. DOI: 10.1080/17449642.2016.1241939.

Nussbaum, M. (2006) *Frontiers of Justice: Disability, Nationality, Species Membership*, Massachusetts, Harvard University Press.

Nussbaum, M. (2010) *Not for Profit: Why Democracy Needs the Humanities*, New Jersey, Princeton University Press.

Oakes, J. (2005) *Keeping Track: How Schools Structure Inequality*, Yale University Press.

Olson, A. (2013) 'The theory of self-actualization', in *Psychology Today*, 13 August 2013, online posting, retrieved from https://www.psychologytoday.com/us/blog/theory-and-psychopathology/201308/the-theory-self-actualization (last accessed 4 September 2019).

Onwuegbuzie, A. and Frels, R. (2016) *Seven Steps to a Comprehensive Literature Review: A Multimodal and Cultural Approach*, Los Angeles, SAGE.

Pappas, C. (2016) 'The transformative learning theory: What eLearning professionals should know', from eLearning Industry, 19 August 2016, online posting, retrieved from https://elearningindustry.com/transformative-learning-theory-what-elearning-professionals-should-know (last accessed 25 August 2019).

Parkman, A. (2016) 'The imposter phenomenon in higher education: Incidence and impact' in *Journal of Higher Education Theory and Practice*, vol. 16, no. 1, pp. 51-60. Retrieved from https://articlegateway.com/index.php/JHETP/issue/view/198 (last accessed 5 March 2020).

Passrella, A. (2018) Johns Hopkins School of Education, Institute for Education Policy, Policy Brief: The Necessary Components of an Effective Career and Technical Education (CTE) Program, retrieved from https://edpolicy.education.jhu.edu/wp-content/uploads/2019/01/CTE-Published-Final-CFC-FINAL.pdf (last accessed 4 June 2019).

Patel, S. (2018) 'Thematic analysis – how do you generate themes?', from Salma Patel, 31 January 2018, online posting, retrieved from salmapatel.co.uk/academia/thematic-analysis-how-do-you-generate-themes/ (last accessed 8 June 2019).

Perkins V (2018) Carl D. Perkins Career and Technical Education Act of 2006, Public Law 88-210: 18 December 1963, As amended through P.L. 115-224, Enacted 31 July 2018, retrieved from https://s3.amazonaws.com/PCRN/uploads/perkins_v.pdf (last accessed 10 September 2019).

Phillips, M. (2012) 'Why should we care about vocational education?', from Edutopia, 29 May 2012, online posting, retrieved from https://www.edutopia.org/blog/vocational-education-benefits-mark-phillips (last accessed 25 August 2019).

Picchi, A. (2013) 'Mike Bloomberg: Skip college, become a plumber', in *MSM Money*, 20 May 2013, online posting, retrieved from http://money.msn.com/now/post.aspx?post=daaa6e72-2c26-4877-adc4-23330abe2c06 (last accessed 1 October 2013).

Pinto-Powell, R. (2018) 'Imposter syndrome: Not exclusive to women', in *Inside Higher Ed*, 20 December 2018, online posting retrieved from https://www.insidehighered.com/views/2018/12/20/what-colleges-can-do-help-students-avoid-impostor-syndrome-opinion (last accessed on 5 March 2020).

Popper, K. (1959) *The Logic of Scientific Discovery*, reprinted 2002, New York, Routledge.

Quillinan, B., MacPhail, A., Dempsey, C. and McEvoy, E. (2019) 'Transformative teaching and learning through engaged practice: Lecturers' and students' experiences in a university and underserved community partnership in Ireland', in *Journal of Transformative Education*, vol. 17, no. 3, pp. 228-250, DOI: 10.1177/1541344618809681

Rabie, S. (2012) 'Vocational education and the need for a change in perceptions', in *The Chronicles*, Summer 2012, pp. 28-29, retrieved from http://dar.aucegypt.edu/bitstream/handle/10526/3687/Chronicles%20Summer%202012.pdf?sequence=1 (last accessed 28 August 2019).

Rausch, D.W. and Crawford, E.K. (2012) 'Cohorts, communities of inquiry, and course delivery methods: UTC best practices in learning – the hybrid learning model, in *The Journal of Continuing Higher Education*, vol. 60, no. 3, pp. 175-180, DOI: 10.1080/07377363.2013.722428

Ravitch, D. (2012) 'Why college-for-all is a sham', in Diane Ravitch's blog, 20 May 2012, online posting, retrieved from https://dianeravitch.net/2012/05/20/why-college-for-all-is-a-sham/ (last accessed 27 August 2019).

Rehman, A.A. and Alharthi, K. (2016) 'An introduction to research paradigms', in *International Journal of Educational Investigations*, vol. 3, no. 8, pp. 51-59.

Ries, E. (1997) 'To "V" or not to "V": For many the word "vocational" doesn't work', in *Techniques*, vol. 8, pp. 32-36.

Robinson, O.C. (2014) 'Sampling in interview-based qualitative research: A theoretical and practical guide', in *Qualitative Research in Psychology*, vol. 11, no. 1, pp. 25-41, DOI: 10.1080/14780887.2013.801543

Rose, M. (2014) 'Not your father's shop class: Bridging the academic-vocational divide', in *American Educator*, vol. 28, no. 3, p. 12-17, retrieved from https://www.aft.org/periodical/american-educator/fall-2014 (last accessed 27 August 2019).

Rosen, R., Visher, M. and Beal, K. (2018) 'Career and technical education: Current policy, prominent programs, and evidence', from MDRC September 2018, online posting, retrieved from https://www.mdrc.org/publication/career-and-technical-education (last accessed 27 August 2019).

Rother, E.T. (2007) 'Systematic literature review x narrative review', in *Acta Paulista de Enfermagem*, vol. 20, no. 2, DOI: 10.1590/S0103-21002007000200001

Rousseau, J. (1984) *A Discourse on Inequality*, M. Cranston (trans.) London, Penquin Books.

Rowe, M. (2016) 'Skilled help wanted and needed' in *Parade Magazine*, via Mike Rowe, 8 April 2016, online posting, retrieved from

mikerowe.com/2016/04/parademagazine-skilledhelpwantedandneeded/ (last accessed 1 September 2019).

Ryan, R. (2013) 'Maybe you should have gone to trade school', in *Huffington Post*, 8 August 2013, online posting, retrieved from http://www.huffingtonpost.com/rachel-ryan/maybe-you-should-have-gon_b_3727695.html (last accessed 1 October 2013).

Saltiel, I.M., and Russo, C.S. (2001) *Cohort Programming and Learning: Improving Educational Experiences for Adult Learners*, Malabar, FL, Krieger Publishing Company.

Samuelson, R.J. (2012) 'It's time to drop the college-for-all crusade', in *The Washington Post*, 27 May 2012, online posting, retrieved from https://www.washingtonpost.com/opinions/its-time-to-drop-the-college-for-all-crusade/2012/05/27/gJQAzcUGvU_story.html (last accessed 27 August 2019).

Sandars, J. and Walsh, K. (2016) 'Self-directed learning', in *Education for Primary Care*, vol. 27, no. 2, pp. 151-152, DOI: 10.1080/14739879.2016.1149956

Schaller, N. (2017) 'The impact of past literacy experiences on perception of motivation', Dissertation submitted in partial fulfillment of the requirement for the degree of doctor of master of Science in Education, Department of Education and Human Development, College at Brockport, State University of New York, May 2017, retrieved from https://digitalcommons.brockport.edu/cgi/viewcontent.cgi?article=1779&context=ehd_theses (last accessed 4 March 2020).

Schon, D. A. (1991) *The Reflective Practitioner: How Professionals Think in Action*, London, Ashgate.

Scribner, J.P. and Donaldson, J.F. (2001) 'The dynamics of group learning in a cohort: From nonlearning to transformative learning', in *Educational Administration Quarterly*, vol. 37, no. 5, pp. 605-636.

Shapiro, S.A., Wasserman, I.L., and Gallegos, P.V. (2012) 'Group work and dialogue: Spaces and processes for transformative learning in relationships', 2006-2010, in E.W. Taylor and P. Cranton (eds), *The Handbook of Transformative Learning: Theory, Research, and Practice*, San Francisco, USA, Jossey-Bass, pp. 355-372.

Simon, S. (2012) 'Obama calls for focus on vocational training', from Reuters, 13 February 2012, online posting, retrieved from https://www.reuters.com/article/us-usa-budget-education/Obama-calls-for-focus-on-vocational-training-idUSTRE81C1Z620120213 (last accessed 7 July 2019).

St.Esprit, M. (2019) 'The stigma of choosing trade school over college', in *The Atlantic*, 6 March 2019, retrieved from https://www.theatlantic.com/education/archive/2019/03/choosing-trade-school-over-college/584275/ (last accessed 27 August 2019).

Strayhorn, T.L. (2012) *College Students' Sense of Belonging: A key to Educational Success for All Students*, New York, New York, Rutledge.

Study.com (2019) 'What are vocational schools', from study.com, 29 January 2020, online posting retrieved from study.com/vocational_schools.html, (last accessed 23 April 2020).

Taylor, E.W. (1998) 'The theory and practice of transformative learning: A critical review. Information Series No. 374.', from ERIC Clearinghouse on Adult, Career, and Vocational Education, Columbus, OH, retrieved from https://eric.ed.gov/?id=ED423422 (last accessed 30 August 2019).

Taylor, E.W. (2009) 'Fostering transformative learning', in J. Mezirow and E.W. Taylor (eds.) *Transformative Learning in Practice: Insights from Community, Workplace, and Higher Education*, San Francisco, Jossey-Bass, pp. 3-17.

Taylor, E.W. and Snyder, M.J. (2012) 'A critical review of research on transformative learning theory', 2006-2010, in E.W. Taylor and P. Cranton (eds.), *The Handbook of Transformative Learning: Theory, Research and Practice*, San Francisco, USA, Jossey-Bass, pp. 37-55.

Tekkol, I.A. and Demirel, M. (2018) 'An investigation of self-directed learning skills of undergraduate students', in *Frontiers in Psychology*, 23 November 2018, DOI: 10.3389/psyg.2018.02324.

Thanh, N.C. and Thanh, T.T.L. (2015) 'The interconnection between interpretivist paradigm and qualitative methods in education', in *American Journal of Educational Science*, vol. 1, no. 2, pp. 24-27.

Tough, A. (1979) *The Adult's Learning Projects*, Toronto, Ontario Institute for Studies in Education.

Travis, E. (n.d.) 'History of vocational education', in Classroom, online posting, retrieved from https://classroom.synonym.com/history-vocational-education-6524178.html (last accessed 9 September 2019).

U.S Department of Education (n.d) 'Perkins IV' from Perkins Collaborative Resource Network, Office of career, Technical, and Adult Education, online posting, retrieved from https://cte.ed.gov/legislation/about-perkins-iv (last accessed 10 September 2019).

US Department of Education, (2004) Office of the Under secretary, 'Policy and Program Studies Service, National Assessment of Vocational Education: Final Report to Congress', Washington DC, 2004, retrieved from https://www2.ed.gov/rschstat/eval/sectech/nave/naveexesum.pdf (last accesses 25 August 2019).

US Department of Education, (2012) Office of Vocational Education, 'Investing in America's Future: A blueprint for transforming Career and Technical Education', Washington DC, 2012, retrieved from https://www2.ed.gov/about/offices/list/ovae/pi/cte/transforming-career-technical-education.pdf (Last accessed 9 June 2019).

US Department of Education, (2018) Press Office, 'Department of Education Hosts Rethink CTS Summit to Identify Opportunities for Expanding CTE Access and Impact through Perkins V', 14 December 2018, online posting, retrieved from https://www.ed.gov/news/press-releases/department-education-hosts-rethink-cte-summit-identify-opportunities-expanding-cte-access-and-impact-through-perkins-v (last accessed 25 August 2019).

US Department of Education (2019) Press Office, 'Today Marks the beginning of a New Era in Career and Technical Education', 1 July 2019, online posting, retrieved from https://www.ed.gov/news/press-releases/today-marks-beginning-new-era-career-and-technical-education (last accessed 25 August 2019).

US Department of Labor: Wage and Hour Division (nd) Wage Surveys. Online posting and links, retrieved from https://www.dol.gov/whd/govcontracts/wagesurveys.htm (last accessed 29 August 2020).

van der Walt, J.L. (2019) 'The term "self-directed learning" – Back to Knowles, or another way to forge ahead?', in *Journal of Research on Christian Education*, vol. 28. no. 1, pp. 1-20, DOI: 10.1080/10656219.2019.1593265

Van Hampton, T. (2013) 'Shortages of craft workers, engineers plague contractors', in *Engineering News-Record*, 10 September 2013, online posting, retrieved from http://enr.construction.com/business_management/workforce/2013/0916-shortages-of-craft-workers-engineers-plague-contractors.asp (last accessed 1 October 2013).

Wang, V.C.X. and King, K.P. (2011) 'Understanding Mezirow's theory of reflectivity from Confucian perspectives: A model and perspective', in Wang, V.C.X and Cranton, P. (eds), *Transformative Learning*, retrieved from https://www.researchgate.net/publication/220139321_Transformative_Learning , DOI: 10.4018/javet.2011100105, last accessed 23 March 2020.

Waring, M. (2012) 'Finding your theoretical position', in J. Arthur, M. Waring, R. Coe, and L.V. Hedges (eds.), *Research Methods and methodologies in Education*, Los Angeles, SAGE Publications Ltd, pp. 15-19.

Watanabe-Crockett, L. (2016) 'How messy learning helps us develop critical thinking', from Wabisabi Learning blog, retrieved from hub.wabisabilearning.com/blog/how-messy-learning-helps-critical-thinking (last accessed 24 April 2020).

Watson, B. (2012) 'Why college may not be the best choice for your education dollar', from Aol., 9 August 2012, online posting, retrieved from aol.com/2012/08/09/college-vs-vocational-education-better-wages-less-debt/ (last accessed 24 April 2020).

Weingarten, R. (2014) 'Engaging hands and minds', in *American Educator*, vol. 28, no. 3, p. 1, retrieved from https://www.aft.org/periodical/american-educator/fall-2014 (last accessed 27 August 2019).

Williams, E.N. and Morrow, S.L. (2009) 'Achieving trustworthiness in qualitative research: A pan-paradigmatic perspective', in *Psychotherapy Research*, vol. 19, no. 4-5, pp. 576-582, DOI: 10.1080/10503300802702113

Wlodkowski, R.J. (2008) *Enhancing Adult motivation to Learn*, San Francisco, CA, Jossey-Bass.

Wyman, N. (2015) 'Why we desperately need to bring back vocational training in schools', in *Forbes*, 1 September 2015, online posting, retrieved from https://www.forbes.com/sites/nicholaswyman/2015/09/01/why-we-desperately-need-to-bring-back-vocational-training-in-schools/#7e676e7c87ad (last accessed 6 June 2019).

Yeboah, A.K. (2012) 'Factors that promote transformative learning experiences of international graduate-level learners', Dissertation submitted in partial fulfillment of the requirements of the degree of Doctor of Philosophy, Department of Adult, Career and Higher Education, College of Education, University of South Florida, retrieved from https://scholarcommons.usf.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=5309&context=etd (last accessed 30 August 2019).

Zainal, Z. (2007) 'Case study as a research method', in *Jurnal Kemanusiaan*, vol. 9, June 2007, retrieved from http://psyking.net/htmlobj-3837/case_study_as_a_research_method.pdf (last accessed 7 September 2019).