

## **ABSTRACT**

HOWARD, MARCUS PHILLIP. Examining Mentors and Apprentices in a Workplace Setting: A Three Study Perspective. (Under the direction of Dr. Jayne Fleener and Dr. Amy Orders).

To respond to the need for quality workers in the advanced manufacturing industry (AMI), this dissertation is comprised of three studies exploring factors that shape the implementation of work-based learning (WBL) in apprenticeships. The goal of the three studies in this dissertation is to identify important factors that shape WBL implementation, which has a primary purpose of equipping apprentices with specialized skills to meet the needs of employers. Furthermore, this dissertation focuses on the implementation of WBL in the North Carolina Triangle Apprenticeship Program (NCTAP) by exploring the perspectives and experiences of the workplace mentors and apprentices involved in work-based learning activities.

The first study is an integrated literature review of the factors shaping successful implementation and outcomes of WBL in apprenticeships. The following two studies dive into the practicality of the theoretical knowledge base. Thus, the remaining two studies are empirical studies aimed to identify the factors that shape WBL implemented in an AMI from the perspective and experiences of the workplace mentors and apprentices, respectively. The second study is guided by sensemaking theory and will examine the roles and responsibilities of workplace mentors during on-the-job training. The third study will explore the experiences of the apprentices and identify factors that shape their engagement in early stages of program implementation. The interpretations of the results from the studies will be cast in terms of actionable implications for practice that will be beneficial to employers, program developers and other relevant stakeholders interested in improving learning in their respective workplace environment.

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Examining Mentors and Apprentices in a Workplace Setting: A Three Study Perspective

by  
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## **DEDICATION**

I would like to dedicate this dissertation to the individuals in my life that have been instrumental in assisting me to achieve my goals. This dedication goes to my parents, friends, supervisors, advisor, and everyone else that has helped me get to where I am today.

## **BIOGRAPHY**

Marcus Howard was born in St. Louis, MO on November 25, 1990. He was raised by his two parents, Mark and Judy Howard, and went to school in the St. Louis Public School District. He was accepted into the top High School in Missouri and after graduating high school, went to the University of North Carolina at Chapel Hill. After graduating with a Bachelor's in Exercise and Sports Science, Marcus decided to teach with Teach for America in Las Vegas, Nevada. In Las Vegas, he also received his Master's in Education with a concentration in Curriculum and Instruction. After teaching middle school science and math for three years at a local charter school, Marcus traveled back to North Carolina to pursue his doctorate in Educational Leadership, Policy, and Human Development at North Carolina State University. In his fourth year in the program, Marcus was offered a new role with Teach for America Las Vegas as the Director of Strategic Innovations. Currently, Marcus designs, tests, iterates, and validates the learning of new strategies/products that accelerate the outcomes for students furthest away from opportunity.

## ACKNOWLEDGMENTS

I would like to thank my dissertation co-chairs and committee for guiding me through this arduous process. I would also like to thank my parents for all their support and my best friends who have always been instrumental in keeping me focused and determined to finish this degree. I would like to thank my mother for going above and beyond as a parent by building my writing skills when I was younger. At a very young age, she would make me go through several drafts of a writing assignment before submitting it to my teacher; this helped me understand the writing process and allowed me to gain a deeper understanding of the collaborative and iterative writing process. I would also like to thank my grandfather as well, for supporting and cultivating my writing ability at an early age, specifically in middle school. Like my mother, he was a gifted writer and helped improve my writing ability by working with me on every writing assignment. I have these two to really thank for shaping me into the writer I am today; a writer who had the wherewithal to complete this dissertation. I would also like to thank my father who has shaped my confidence and has instilled in me the strength and courage to tackle any challenge or obstacle that is placed in front of me. Completing the dissertation process was one of the most difficult things in my life, and my father's lessons have helped me endure. Lastly, I would like to thank my best friends who motivate me to be better and continue to strive for greatness. Ultimately, success is a collaborative effort and has been shaped by the many people in my life who support me on my journey to greatness.

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## CHAPTER 1: Introduction

Employers in the U.S. are having difficulty filling jobs due to a widespread skills gap (Cappelli, 2015; Lowry & Thomas-Anderson; Manufacturing Institute, 2018; Robertson & De Aquino, 2016). A skills gap is defined as a mismatch between the job-market needs in business and the preparedness levels of the workforce. Pressures to innovate and sustain competitive advantage in global markets have forced industries such as IT, healthcare, construction, and advanced manufacturing to assess their current workforce and realize that their workforce is aging and in need of workers with higher-level skills. Employers have identified a robust talent pipeline and reliable employees who can communicate well, effectively make decisions, and who are interested in long-term careers with the company as people who will narrow the U.S. skills gap (Richard, 2015). A major key to preparing the emerging U.S. workforce is through work-based learning (WBL).

WBL is an educational strategy that blends theory and practice and is utilized in apprenticeships to alleviate the skills gap and cultivate a skilled and loyal workforce (Cappelli 2015; Lerman, 2014). According to Chisholm, Harris, Northwood, & Johrendt (2009), WBL is defined as an “educational process which drives learners to engage intellectually, socially, emotionally, and physically in an unpredictable work-related environment where they will go through the potential failure, take measured risks, experience adventure through creativity and innovation, and achieving success” (p. 327) and has foundations in experiential learning. The U.S. Department of Education (USDE, n.d.) defines WBL as “an instructional strategy that enhances classroom learning by connecting it to the workplace.” Epstein (1994) suggests that adults learn by working rather than by classroom instruction, an idea that Dewey (2007) supports, saying that adults learn by doing. WBL is one of the few learning theories that blends

theory and practice and is mindful of situated learning, a strategy that is provisional until tried out in practice (Langer, 1997).

WBL programs' instructional strategy is designed to achieve educational outcomes in workers. A variety of WBL programs include internships, cooperative work experiences, job showing, service learning, externships, worksite field trips, and apprenticeships. Highly effective WBL programs are partnerships between industry employers and higher education institutions that formalize the partnership through a contractual agreement. The learners or students are employees, and the learning program derives from the needs of the workplace and the learner rather than from a pre-defined academic curriculum (Boud & Solomon, 2001). To design the learning, the program first assesses the strengths, weaknesses, and competencies of the targeted learners in order to create a personalized curriculum for the learner. An example of a WBL program used by employers to develop a skilled workforce is the apprenticeship model.

Apprenticeships are highly effective WBL strategies for developing skilled workers that meet the need of employers. Workers within apprenticeships are known as apprentices and, oftentimes, apprentices complete on-the-job training (OJT) in the workplace while taking related instruction (RI) in a classroom with their employer and partner education institution. During the program, the apprentice earns a salary and interacts with both a workplace mentor and classroom instructor. WBL in apprenticeships is experienced by the learner through OJT and RI. In addition to not having to sacrifice earning during the WBL, apprentices' long-term earnings from WBL exceed the gains they would have made had they graduated from a community college with a more generalized degree (Hollenbeck, 2008). Employers benefit from WBL because they are able to invest in an employee who has been trained with specific skills to meet the needs of their business. Apprenticeships can improve workers' transition from school to career, upgrade

employees' skills, increase U.S. productivity, achieve positive returns for employers and workers, and utilize limited federal resources more effectively (Holzer & Lerman, 2014). North Carolina is one of the states in the U.S. that effectively develops their future workforce through apprenticeships. One of the two major umbrella apprenticeship programs in North Carolina is the North Carolina Apprenticeship Program (NCTAP), and this program has been selected for the subject of study because its pervasiveness allows for in-depth research into the experiences of WBL mentors and apprentices and further research into ways to better improve training and development for North Carolina's future workforce. Furthermore, NCTAP focuses on apprenticeships in the advanced manufacturing industry (AMI), an industry that combines traditional manual labor with advanced technology. Therefore, implications from the dissertation will be relevant to an emerging advanced manufacturing workforce. This program will be described below.

### **Program Description**

North Carolina Apprenticeship Program (NCTAP) is a WBL program based in North Carolina's Triangle (Raleigh, Durham, Chapel Hill) area and is designed to develop skilled workers needed in the modern workforce. Like many WBL programs, NCTAP is a partnership between 11 companies, two community colleges, and the U.S. Department of Labor. The four-year program focuses on training that integrates academic, technical, and employability skills to prepare students to be productive in an advanced manufacturing workplace setting. Students ultimately graduate from the program with an associate degree in Mechanical Engineering Technology or in Mechatronics Engineering Technology. They also leave the program with employment in one of the company partners that include but not limited to Buhler Aeroglide, CaptiveAire, Morris & Associates, Revlon, and Schmalz. Both degrees are attained through OJT

with the company partners supplemented with academic or related instruction from one of the community college partners. The program is a registered apprenticeship program and, therefore, it is mandated that apprentices complete 6,400 hours of on-the-job training and 1,600 hours of academic or related instruction (NCTAP, 2020). The completion of the program also leads to a Journeyman Certificate issued by the North Carolina Community College System and U.S. Department of Labor.

In the first-year, high school seniors spend half of their day at school and the other half in a workplace setting. During the remaining three years, students spend four days during the week in a workplace setting and one day of the week in a community college classroom. Table 1.1 describes the major components of the NCTAP program. Figure 1.1 shows the logic model with components and expected outcomes.

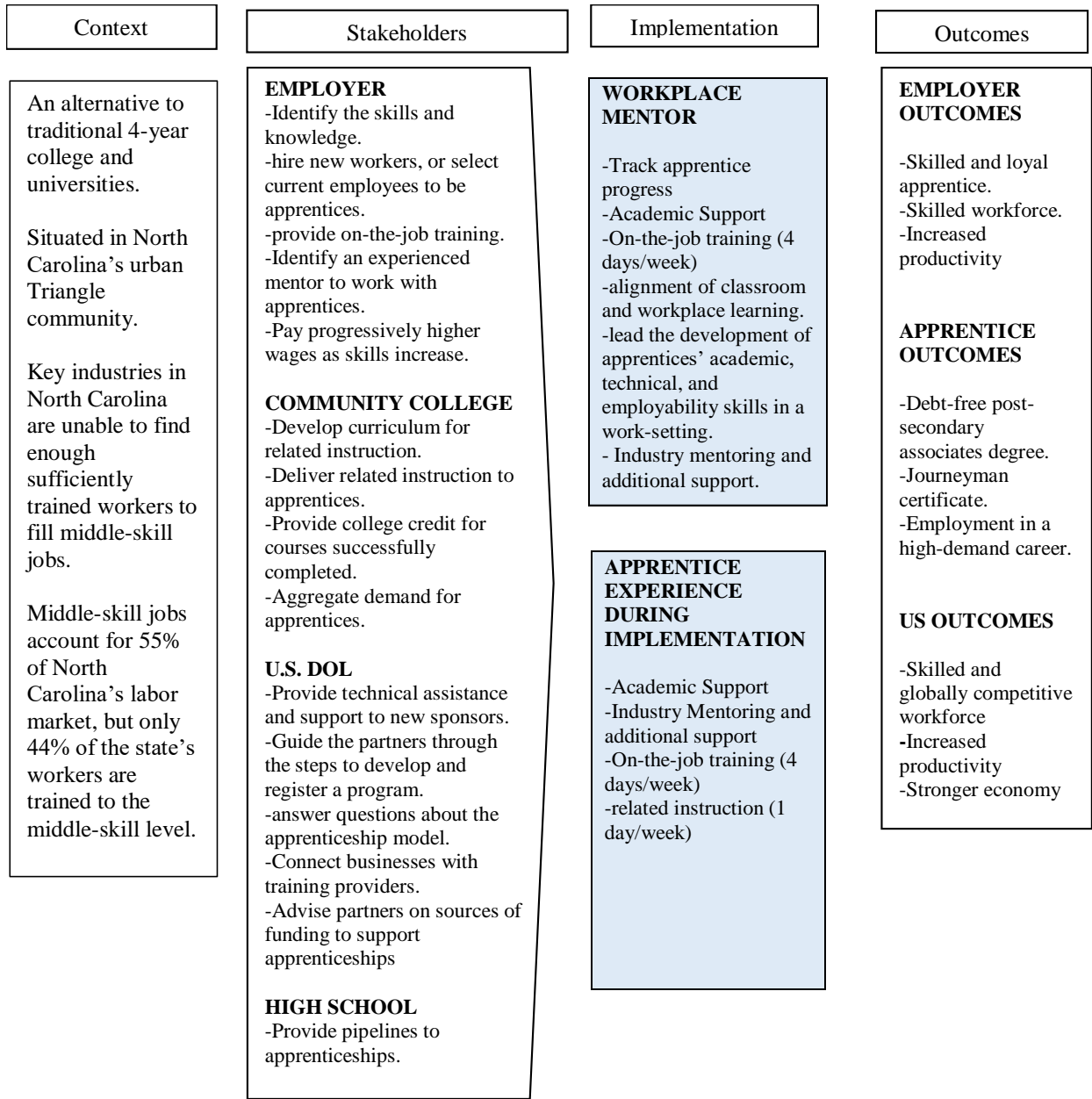
Table 1.1.

*Description of the NCTAP Major Program Components*

Component	Description
Business Involvement	Employers are the foundation of every apprenticeship as they identify the skills and knowledge that apprentices must learn, hire new workers to be apprentices, provide on-the-job training, identify an experienced mentor to work with apprentices, and pay progressively higher wages as apprentices' skills increase.
Structured On-the-Job Training	Apprentices receive on-the-job training from an experienced instructor or industry mentor throughout their time in NCTAP.
Related Instruction	This registered apprenticeship program combines on-the-job learning with theoretical education provided by the North Carolina Community College System.
Compensation	Apprentices undertake productive work for their employer and earn a salary which increases as their competency increases.
National Occupational Credential	Upon completion of the work and related instruction, the apprentice is considered "skilled and knowledgeable" and will receive certification as a "journeyman" in the field.

Source: Toolkit (2016). Building Registered Apprenticeship Programs. Retrieved September 22, 2018, from [http://www.doleta.gov/oa/employers/apprenticeship\\_toolkit.pdf](http://www.doleta.gov/oa/employers/apprenticeship_toolkit.pdf).





NOTE: The NCTAP logic model includes contextual research that supports the driving factors for the apprenticeship program. The roles of the stakeholders demonstrate the input that each stakeholder contributes to ensure NCTAP meets the needs of the state, employer, educational institution, and apprentices. The implementation looks at the business and community college-level and student-level activities. The highlighted areas are the focus area of the three studies.

Figure 1.1. North Carolina Triangle Apprenticeship Program Logic Model

This dissertation will present three different studies that address the nature of WBL implementation as experienced by WBL mentors and apprentices. The driving focus of this dissertation is the exploration of how stakeholders who implement WBL in apprenticeships, can contribute to the needs of business and industry and support workplace development, especially in highly technical fields.

The first study will present an integrated literature review of the factors shaping successful implementation of WBL. The literature review will reveal the elements that apprentices bring into the workplace even before the work begins that are factors that the workplace cannot necessarily train for. These elements are known as individual factors and include prior non-technical skills, self-regulation, personal relationships outside of work, and occupational identity. These factors shape apprentices' willingness to engage and ability to focus to learn new technical skills. Ultimately, the literature review will demonstrate that apprentices are just as responsible for the successful implementation of WBL in apprenticeships as in the workplace. The literature review will also demonstrate the importance for companies to afford apprentices skilled personnel, guidance with autonomy, positive and meaningful work relationships, and a culture of continuous learning. Successful implementation of WBL in apprenticeships is also based on institutional factors, or what the workplace affords to the apprenticeship, specifically the WBL mentor.

The first study will be submitted to the *International Journal of Training and Research*, a journal that publishes articles that advance knowledge and understanding of vocational education and training (VET) internationally. Furthermore, the journal focuses on current or recently completed research and reviews of research on training, technical education and vocational education, and publishes original research, articles, or book reviews. Ultimately, the journal

articles address the interests of researchers, educators, trainers, policymakers, and skills capacity planners in training, technical education, and vocational education. The first study is fitting for this journal because it explores the factors shaping WBL in apprenticeships around the world and thus advances knowledge and understanding of the WBL implementation in VET.

The second study will be guided by sensemaking theory and will explore the experiences of workplace mentors during the implementation of work-based learning. The purpose of the second study is to describe the interpretations of WBL mentors and investigate the factors that shape those interpretations. This investigation will be especially important because empirical studies (Coburn, 2001, 2005; Spillane, Reiser, & Reimer, 2002; Stensaker et al., 2008) suggest that action is based on how people notice or select information from the environment, make meaning of that information, and then act on those interpretations, developing culture, social structures, and routines. Therefore, exploring how workplace mentors make sense of their role helps researchers understand their routines and actions, and ultimately their implementation of work-based learning in apprenticeships. The second study will describe the roles and responsibilities that WBL mentors perceive as relevant to implementing WBL in their respective workplaces. The study will also explore the sociocultural factors that shape the sensemaking of the WBL mentors in the form of individual and institutional factors. Though the roles and responsibilities of workplace mentors are becoming increasingly important, limited research exists regarding their overall experiences (Billett, 2003; Boud & Garrick, 1999; Evan & Rojewski, 1999; Kenny et al., 2015; Porrtman, Illeris, & Nienwenhius, 2011). This study ultimately advances theory and practice related to the selection and preparation of mentors in WBL programs and help mentors become clear about WBL and their role in guiding and implementing the learning strategy in the workplace (Kenny et al., 2015; McIntosh et al., 2014).

The second study will be submitted to the *Journal of Workplace Learning*, a journal that focuses on the workplace as a site for learning and a scope that encompasses formal, informal, and incidental learning in the workplace for individuals, groups, as well as work-based learning, and off-the-job learning for the workplace. There is also a focus on learning in the workplace and the interventions that might assist the learning process along with the roles of those responsible directly or indirectly for such interventions. In this study, those individuals directly responsible for WBL in apprenticeships are the WBL mentors, which is the focus for this study and thus will provide insights that will be relevant to this journal.

The third study will explore the experiences of the apprentices and identify factors that shape their engagement in early stages of program implementation. The purpose of the third study is to describe which individual and institutional factors shape apprentice engagement during WBL in an apprenticeship context, and to discuss how their experiences with related instruction shape their overall engagement in the apprenticeship program. Ultimately, this study will have practical and theoretical implications. Program developers, mentors, and instructors will be able to follow recommendations on how to increase engagement, and human resource departments can use the results to identify and reduce the threats and increase the drivers of engagement for employees. These findings will also contribute to a recent, emerging field of study about the phenomenon of workforce engagement (Rich, Lepine, & Crawford, 2010; Saks, 2006; Wefald & Downey, 2009).

The third study will be submitted to the *Journal of Workplace Learning*, a journal that focuses on the workplace as a site for learning. More specifically the journal focuses on learning in and from the workplace and the nature of interventions that might assist the learning process along with those responsible for shaping the learning process. Another aim of the journal is to

explore factors which influence how learning takes place, and the third study will identify individual and institutional factors that shape engagement, and thus shapes learning in the workplace.

Finally, the interpretations of the results from all three studies will be cast in terms of actionable implications for practice and will comprise the final summary. These results will be beneficial to employers, program developers and other relevant stakeholders interested in improving learning in the workplace. The interpretations of the results from all three studies will also contribute to the body of literature on WBL and factors that shape implementation of WBL.

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## **CHAPTER 2: Factors that Shape Work-Based Learning Implementation in Apprenticeships around the Globe: An Integrated Literature Review (Study 1)**

A shortage of skilled workers has forced employers to develop their workforce in alternative or nontraditional ways. The complaints from employers are that not enough college graduates are trained in practical fields such as computer science and engineering and that there is a widespread shortfall in the basic skills of future employees (Cappelli, 2015; Lowry & Thomas-Anderson; Manufacturing Institute, 2018; Robertson & De Aquino, 2016). Employers in industries such as advanced manufacturing, healthcare, and Information Technology (IT) have begun to utilize apprenticeship programs to develop skilled workers and alleviate the current shortage and build to replace large numbers of retirees in the near future. There is also a growing need for reliable employees who can communicate well, make effective decisions, and desire long-term careers with opportunity for advancement (Richard, 2015). Pressures to innovate and sustain competitive advantage in global markets have forced industries such as the advanced manufacturing industry (AMI) to assess their current workforce and recruit and train younger workers (Twigg, 2012).

A major key to preparing the emerging workforce is through work-based learning (WBL). The factors that shape WBL in traditional apprenticeship programs have, in recent years, been identified, studied, and described by academics who focus on vocational and workplace learning due to the changing character of work. WBL research investigates how the workplace can be a learning environment, as compared to the formal learning context of a classroom, yet despite the promise of WBL as a way to train the current and future workforce, the features of workplace learning have been less studied (Pylväs, Nokelainen, & Rintala, 2018; Virtanen & Tynjala, 2008). There is a vast array of literature of WBL that takes different theoretical and



organizational perspectives, yet there is scant information regarding the factors that shape successful implementation in a traditional apprenticeship context.

To assess the current literature and recognize the gaps in current WBL research, this integrative literature review identifies, describes, and summarizes academic literature on WBL between 2008 and 2019 in order to explore the areas of research that are missing to understand and improve the effectiveness of WBL implementation in apprenticeships. More specifically, the guiding research question is: What are the individual and institutional factors that shape the implementation of the critical components of work-based learning in traditional apprenticeships around the world?

The methodology that guided this integrated literature review was modeled on that described in Torracco's (2016) "Writing Integrative Literature Reviews: Guidelines and Examples," which defines an integrative literature review as a form of research that reviews, critiques, and synthesizes literature on a particular topic in such a way that new perspectives on the topic are generated. After first defining WBL, this review includes the results of a rigorous methodological approach that was completed in four major steps: problem identification, literature search, data evaluation, and data analysis and reporting (Boisvert, Proulx-Belhumeur, Gonçalves, Doré, Francoeur, & Gallani, 2015).

## **Defining Work-Based Learning and Its Core Components**

### **Defining Work-Based Learning**

WBL is an educational strategy that blends theory and practice and is utilized by apprenticeships to alleviate the skills gap and cultivate a skilled and loyal workforce. Epstein (1994) suggests that adults learn by working rather than by classroom instruction, an idea that Dewey (2007) supports, saying that adults learn by doing. WBL is one of the few learning

strategies that blends theory and practice and is mindful of situated learning which does not consider pre-existing knowledge as fixed but rather as provisional until tried out in practice (Langer, 1997). According to Chisholm, Harris, Northwood, and Johrendt (2009), WBL is a comprehensive “educational process which drives learners to engage intellectually, socially, emotionally, and physically in an unpredictable work-related environment where they will go through potential failure, take measured risks, experience adventure through creativity and innovation, and achieve success” (p. 327). The U.S. Department of Education defines WBL as “an instructional strategy that enhances classroom learning by connecting it to the workplace” (United States Department of Education, n.d.).

### **Critical Components of Work-Based Learning**

WBL programs are those that focus on the workplace as the learning context and include instructional strategy designed to achieve specific, employer-identified educational outcomes in learners. WBL programs are partnerships between industry employers and education institutions and are formalized through a contractual agreement. The learners are employees and the learning program derives from the needs of the workplace and the learner, and not from a predefined academic curriculum (Boud & Solomon, 2001). Since there is no predefined academic curriculum, the program first assesses the strengths, weaknesses, and competencies of the learner in order to integrate a personalized curriculum. According to the U.S. Department of Education’s WBL framework, the critical components of comprehensive WBL programs in the United States are: (1) the alignment of classroom and workplace learning; (2) application of academic, technical, and employability skills in a work setting; and (3) support from classroom or workplace mentors.

The framework's critical components are broken down even further. Alignment of classroom and workplace learning is achieved when WBL experiences meet the following criteria: help meet industry demands for a more skilled workforce by providing opportunities for students to receive training, learn skills, and gain experience in all aspects of an industry; map academic content to authentic workplace tasks and integrate workplace tasks and classroom instruction; allow students to reflect on their learning process and experience; and require training on how to integrate WBL experiences into curriculum and instruction (U.S. Department of Education, n.d.).

Application of academic, technical, and employability skills in a work setting occurs when WBL experiences are based on rigorous academic and employability skill requirements and include in-depth and hands on work experiences with activities ranging from career awareness and exploration to career preparation and training. The third component outlines the responsibilities of the workplace and/or classroom mentor. These responsibilities include promoting student engagement through mentorship; allowing students to develop relationships with industry professionals; monitoring and evaluating student progress; and participating in mentor training that involves ways to provide students with industry-specific support, general career and education guidance, and a genuine connection (U.S. Department of Education, n.d.). The factors of WBL apprenticeships that shape the implementation of these critical components will be discovered through the literature review and discussed in detail below. First, a description of WBL apprenticeship models will be described to provide focus for the literature review.

## **Apprenticeships as Work-Based Learning Programs**

This study will focus on WBL in formal apprenticeship programs. Other WBL, including more informal programs that do not include credit-bearing or inter-institutional agreements will not be included in this review.

Apprenticeships are a type of WBL program that utilizes the WBL strategy for developing skilled workers that meet the needs of employers. Apprenticeship is carried out for the successful transition from the school to the labor market and solve the job-skill mismatch between education field and workplace (Lee et al., 2016). Switzerland, like other European countries such as Germany and Austria, has a long-standing tradition of initial vocational education and training (VET) based on apprenticeships (Filliettaz, 2011).

Apprenticeships are designed to improve the transition from school to career, upgrade skills, increase U.S. productivity, achieve positive returns for employers and workers, and use limited federal resources more effectively (Lerman, 2014). In traditional apprenticeships, apprentices complete on-the-job training (OJT) in the workplace and take related instruction (RI) in a classroom with their employer and partner education institution while earning a salary and interacting with a workplace mentor and classroom instructor. This is beneficial to both the apprentice and the employer because apprentices do not have to sacrifice earning during their education and training (Hollenbeck, 2008), and employers are able to invest in an employee who has been trained with skills to meet the needs of their business.

According to the U.S. Department of Labor, thousands of manufacturers across the U.S. and global competitors use the apprenticeship model to recruit, train, and retain a skilled workforce (n.d.). U.S.-registered apprenticeships have been the most effective training model for enhancing companies' performance and competitiveness (U.S. Department of Labor). Most

registered apprenticeship programs are built using a traditional four-year model that combines on-the-job learning and related instruction and includes progressive pay that is directly tied to the mastery of skills (U.S. Department of Labor Toolkit, 2016). Apprentices typically spend one day of the week in a community college classroom exploring academic knowledge and the remaining four days of the week in the workplace integrating the academic knowledge with technical and employability skills training. Stephen Hamilton (2010) from Cornell University and Nancy Hoffman (2011) from Harvard University both recently published books that explored apprenticeships in-depth in the United States and around the world. Hamilton's *Apprenticeship for Adulthood* explores the historical implications of apprenticeship around the world, makes comparisons between U.S. and German apprenticeship models, and discusses the overall implications for apprenticeships in the United States. Hamilton suggests that the success of German apprenticeships can serve as a model for similar programs in the United States to improve the transition of U.S. youth from school to work (Hamilton, 2010). Hamilton suggests that "apprenticeship can motivate youth to perform well and behave responsibly by giving them a clear vision of adult opportunities and the paths leading to them, and by interacting harmoniously with constructive influences from the family, community, and peer group."

Hoffman's (2011) *Schooling in the Workplace: How Six of the World's Best Vocational Education System Prepare Young People for Jobs and Life* examines apprenticeships from a global perspective and does an in-depth analysis of six models from around the world. Hoffman contends that countries with strong vocational education and training (VET) programs have high rates of upper secondary completion. She highlights the apprenticeship programs in Austria, Germany, and Switzerland and contends that the majority of their students are in VET systems and have graduation rates above 90%. According to Hoffman, high quality VET systems include:

“a broad conception of vocation, a qualifications system that codifies agreements among occupational sectors as to what an entry-level worker needs to know and be able to do, employer engagement, and intermediary organizations that share the responsibility with employers for workplace learning.” Overall, both authors contend that apprenticeships have been effectively utilized around the world to improve the transition from school to work, and the U.S. can follow this model to do the same and meet the demands of the emerging workforce.

With these understandings of apprenticeship models to support WBL efforts, an examination of the literature will reveal the effectiveness and factors shaping the success of WBL apprenticeship approaches. Once the research has been reviewed, areas in need of further study will be identified.

### **Problem Identification: Factors Shaping WBL Implementation in a Traditional Apprenticeship Context**

There is a vast array of literature on WBL, arising from different theoretical and organizational perspectives, suggesting great interest in WBL (Boud & Solomon, 2001; Costley & Dikerdem, 2011; Dalrymple, Kemp, & Smith, 2014; Langer, 1997; McIver, Lengnick-Hall, Lengnick-Hall, & Ramachandran, 2013; Meisel & Fearon, 1996; Peters & Smith, 1998; Raelin, 2000; Zegwaar, Coll, & Hodges, 2003). However, there is scant literature exploring the factors that shape the implementation of the critical components of WBL in apprenticeships. This is a critical time to undertake such a review because of the tremendous momentum currently surrounding the implementation of WBL through apprenticeship across the world (Ali, 2017; Duemmler, Felder, & Caprani, 2018; Moon, 2018; O’Donovan, 2018; Siregar, 2018). Despite the growing popularity of apprenticeship programs in the U.S., there is continuing apprehension about apprenticeships and whether they can effectively serve as an alternative to traditional

postsecondary education as a mechanism for workforce development. Considering the high level of interest from policymakers, employers, and students, this integrated literature review provides an overview of the empirical research concerning factors shaping the critical components of WBL in an apprenticeship context. Individual and institutional factors that shape implementation are identified, having been extracted from the literature on the most influential to work-based learning experiences in apprenticeships (Coburn 2001, 2005; Durlak & DuPre, 2008; Freestone, Thompson, & Williams, 2016; Harris & Simons, 2005; Ikemoto, 2007; Spillane, Reiser & Reimer, 2002). The following research question guided the literature search: What are the individual and institutional factors that shape the implementation of the critical components of work-based learning in traditional apprenticeships around the world?

#### **Literature Search: Methodological and Analytical Approach**

There was a rigorous methodological approach to searching literature relevant to the central question. The approach included conducting an extensive electronic search in the databases: ERIC, Business Source Complete, PsycINFO, Professional Development Collection and Social Sciences Citation Index (SSCI). The following search terms were used: *work-based learning*, *learning at work* and *workplace learning*. These terms were used in combination with *apprenticeship program*. The search was limited to empirical studies because the purpose was to explore factors that lead to successful implementation of WBL in a traditional apprenticeship context, and therefore would need to be guided by empirical research. Moreover, the search excluded non-academic research reports from corporations, nonprofits, government departments, and other organizations whose work could not provide substantiate evidence to answer the research questions.

The search was also limited to peer-reviewed full-text journal articles between 2008 and 2019 and included publications in diverse but relevant research areas related to the work-based learning in apprenticeships. These research areas included: vocational education, educational research, higher education, organizational learning, professional development, and adult learning. The abstracts and keywords of the studies were examined to determine if the text met the criteria outlined and was relevant to the literature review. After studies were selected from reading abstracts and keywords, the rigor of the quantitative and qualitative methods was assessed.

The trustworthiness of each study was examined to assess the researchers' rigor. For qualitative studies, elements of the study that were examined were the duration of the study, sampling procedures, reflexivity, triangulation, member-checking, interview techniques, evidence of thick description, transparency of research methodology, use of theoretical framework to guide methodology, and sampling procedures. For quantitative studies, elements of the study that were examined were transparency and explication of statistical methods, description of how well internal validity of study was managed, validity of instruments used to measure phenomenon, and how well the research design minimized the effects of competing and/or confounding variables by control or randomization. For mixed method studies, the same procedure and elements were examined for rigor. The complete systematic process can be seen in Appendix A.

An analytical approach was taken to further examine the sources that were identified as relevant to the study. I developed an initial set of codes that can be reviewed in Table 2.1, to guide the examination of the literature and answer the central research question. The codes were organized into two initial categories that reflect the overarching factors that shape



implementation of the critical components of WBL (individual and institutional). Articles in which no codes were able to be constructed, were discarded and not used in the study. The reference sections for each of the remaining studies were also reviewed for additional relevant texts. There were 42 sources identified as relevant for this study (Appendix B).

### **Findings**

The purpose of this literature review was to describe the individual and institutional factors that shaped successful implementation of the critical components of WBL in apprenticeships around the world. After reviewing the literature, there was strong evidence to suggest that both individual and institutional factors shaped successful implementation of the critical components of WBL and those factors are described in detail in the next section. This body of research emphasizes the sociocultural nature of WBL and the role of mentors in learning at work. Furthermore, there is evidence to suggest that the apprentices bring prior knowledge and skills as well as individual agency into the workplace, and those individual factors have a major influence on the implementation of WBL. The literature suggests that the workplace affords opportunities for learning, development, and engagement that ultimately shapes successful WBL. These individual and institutional factors were identified from empirical studies based on apprenticeships from around the world such as Denmark, Germany, United States, and Sweden, but with most of the research coming out of Australia, Finland, New Zealand and Switzerland. Table 2.2 identifies the factors and the sources that discussed each. Figure 2.1 summarizes each identified factor that influences WBL.

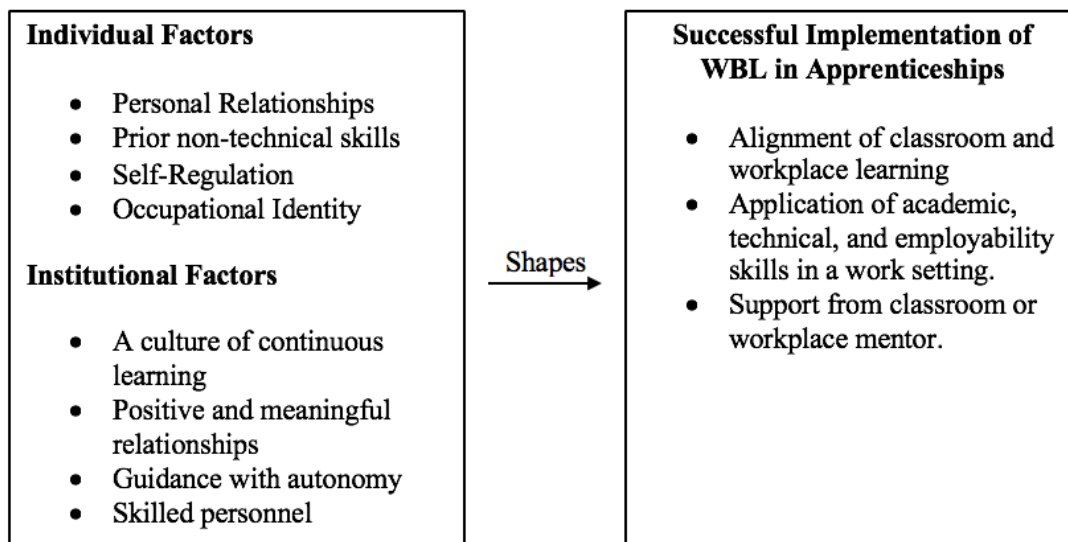
Table 2.1.

*Factors Shaping Successful Implementation of WBL in Apprenticeships*

Factor(s)	Number of Articles Factor Identified	References Factor Identified
<i>Individual Factors</i>		
Prior Non-Technical Skills	15	Cotton, 2001; Cassidy, 2006; O'Donovan, 2018; Hill & Dalley-Trim, 2018; Chan, 2015; 2017; Fridland & Moore, 2014; Lave 2011; Chan, 2013; Salzman, Berweger, & Ark, 2018; Chan, 2017; Fillietaz, 2017; Kenny et al., 2015; Conway & Foskey, 2015; Duemmler, Felder, & Caprani, 2018
Self-Regulation	20	Pylavas et al., 2018; Kaplan 2008; Hill & Dalley-Trim, 2018; Virtanen et al., 2014; Gurtner et al., 2011; Reegard, 2011, 2015; Virtanen & Tynjala 2008; Nielson, 2008; Corney and du Plessis, 2010; Fillietaz 2011; Koskela and Palukka 2011; Onnismaa 2008; Fillietaz 2017; Conway & Foskey, 2015; Duemmler, Felder, & Caprani, 2018; Hattie, 2009; Kenny et al., 2015; Billett 2014; Chan, 2014
Personal Relationships	10	Corney & du Plessis, 2010; Hill & Dalley-Trim, 2008; Chan, 2014; Corney and du Plessis, 2010; du Plessis et al., 2009; Feeney & Bozeman 2008; Brockmann (2013); Chan (2013); Salzmann, Berweger & Ark (2018); Kenny et al. (2015)
Occupational Identity	12	Stokes & Wyn, 2007; Taylor, 2008; Vincent & Braun, 2011; Duemmler, Felder, & Caprani, 2018; Zittoun, 2016; Jenkins 2008; Woods (2012); Salzmann, Berweger, & Ark (2018); McCormack, Pancini, & Tout (2010); Hill, & Dalley-Trim (2008)
<i>Institutional Factors</i>		
Skilled Personnel	25	Hill & Dalley-Trim, 2008; Chan, 2014; Corney and du Plessis, 2010; Fillietaz, 2011; Nielsen (2008); Moon, 2017; Chan, 2015; Guile and Young, 2011; Parkinson et al., 2018; Onstenk, 2017; Parkinson et al., 2018; Vaugahan, 2017; Virtane & Tynjala, 2008; Onstenk, 2010; Lucas & Spencer (2015); Holmes & Wodham, 2013; Zhao, Seifried, & Sieweke, 2018; Chan, 2017; Kenny et al., 2015; Akkerman, & Bakker (2012); Behrens, Pilz, & Greuling, (2008); Chan (2013); Fjellström, & Kristmansson (2016); Gow et al. (2008); Kenny et al. (2015); Messmann & Mulder (2015)

Table 2.2 (Continued)

Factor(s)	Number of Articles Factor Identified	References Factor Identified
Guidance with Autonomy	16	Fillettaz, 2011; Virtanen et al. (2014); Koskela and Palukka, 2011; Onnismma, 2008; Corney & du Plessis, 2010; Duemmler, Felder, & Caprani, 2018; O'Donovan, 2018; Reegard, 2015; Sappa, V., & Aprea, C. (2014); Chan, S. (2017); Fjellström, M., & Kristmansson, P. (2016); Gurtner, J. L., Cattaneo, A., Motta, E., & Mauroux, L. (2011); Kenny et al. (2015); Hill, A., & Dalley-Trim, L. (2008); Parkinson, J., Mackay, J., & Demecheleer, M. (2018); Zhao, B., Seifried, J., & Sieweke, J. (2018)
Positive and Meaningful Relationships	9	Conway & Foskey (2015); Kenny et al. (2015); Niessen, Sonnentag, & Sach (2012); Taylor & Freeman (2011); Sappa & Aprea (2014); Pylväs, Nokelainen & Rintala (2018); O'Donovan, D. (2018); Messmann, G., & Mulder, R. H. (2015); Kenny et al. (2015)
A Culture of Continuous Learning	15	Moon (2018); Cortini (2016); Zhao, Siefried, & Sieweke (2018); Onstenk (2017); Fiilliettaz (2011); Corney & du Plessis (2010); Onstenk (2009); Woods, J. G. (2012); Pylväs, L., Nokelainen, P., & Rintala, H. (2018); Sappa, V., & Aprea, C. (2014); Parkinson, J., Mackay, J., & Demecheleer, M. (2018); O'Donovan, D. (2018); Poortman, C. L., Illeris, K., & Nieuwenhuis, L. (2011); Monks, A. (2010); Kenny et al (2015)



*Figure 2.1.* Factors Shaping Successful Implementation of WBL in Apprenticeships

### **Individual-level Factors**

The literature review identified individual-level factors that shaped the implementation of the critical components of work-based learning in an apprenticeship context. These individual factors were present in apprentices that participated in WBL in apprenticeships located in different areas of the world. Moreover, apprentices possessed these individual-level factors even before participating in WBL in their apprenticeship program. There is strong evidence to suggest that these individual-level factors include prior non-technical skills, self-regulation, personal relationships, and occupational identity.

**Prior non-technical skills.** Apprentices enter apprenticeship programs with non-technical skills that have been acquired prior to joining their programs. These skills were either acquired from years of work experience or from formal school coursework. Non-technical skills, also known as employability or social skills, include oral communication, higher order skills such as learning skills and strategies, problem solving, decision-making, and teamwork (Cassidy,

2006; Cotton, 2001;). This literature review showed that apprentices' ability to use their prior knowledge and non-technical skills allowed them to achieve full participation in their respective communities of practice and work with peers on a new challenge in the workplace (O'Donovan, 2018). This literature review highlighted the following non-technical skills that shaped the implementation of WBL: the ability to focus and imitate, and effectively communicate with others in the workplace.

Apprentices' ability to focus on a task has been demonstrated as a major predictor of learner success (Chan, 2015, 2017; Hill & Dalley-Trim, 2018). This ability to focus on a task is so important in WBL because apprentices acquire skills through imitation (Billett, 2014; Chan 2015, 2017). Imitation is "the reproduction of an observed behavior where the agent imitating (1) recognizes the behavior of the demonstrator as goal-oriented and (2) has some particular interest in or concern for replicating the precise technique performed by the author of the observed action" (Fridland & Moore, 2015, pg. 2). Learning through imitation has also been included in ethnographical literature focused on apprenticeship learning (Chan, 2017; Lave, 2011). Moreover, imitation plays an important role in skill learning, contributing to how humans learn complex tasks which often have deep contextual and distinctive applications (Chan, 2017). Learners learn through imitation, the ways of doing, thinking, being, and feeling as modelled to them by the practitioners within the workplace (Chan, 2013). Furthermore, an apprentices' ability to focus is needed when imitating or "acting out" of observed skill patterns when concentrating on aspects of the activity as it proceeds and adjusting to accommodate their own movements, stances, and processes (Chan, 2017). Learning through imitation often leads to practical knowledge becoming subsumed and tacit (Chan, 2017). In addition to having the

ability to focus and imitate, apprentices' ability to effectively communicate is another non-technical skill that shapes WBL in apprenticeships.

Apprentices' ability to effectively communicate before they enter apprenticeships is key to their learning and development, and ultimately dictates their ability to build strong relationships with those in their apprenticeship program, specifically their WBL mentor. Cognitive and social processes, as illustrated by Filliettaz's (2011) study, are not constructed independently from social skills such as communication. For; apprentices to maximize their learning potential in the workplace, they must be able to use language to articulate their need for guidance. Language-in-interaction, an important mediating tool, allows WBL mentors and apprentices to engage and prepares WBL mentors to potentially incorporate pedagogical strategies such as reflection and/or feedback more effectively (Chan, 2017; Fillietaz, 2011; Kenny et al., 2015; Salzman, Berweger, & Ark, 2018). Effective communication is also important because employers expect apprentices to be self-directed and autonomous over their learning and development (Conway & Foskey, 2015; Duemmler, Felder, & Caprani, 2018).

Apprentices' ability to effectively communicate is also vital to building robust relationships with their WBL mentor, specifically building trust and helping apprentices open up to the affordances provided by the workplace. Relationships within the workplace are built on how well the apprentice and workplace mentor communicate with each other. Dispositions are also important social cues from apprentices that guide positive relations between themselves and WBL mentor (Vaugahan, 2017). Ultimately, communication is a social skill or soft skill that is needed for all workers to become, and continue being capable practitioners, especially in a work setting for apprentices (Gurtner, Cattaneo, Motta, & Mauroux, 2011; Reegard, 2011; Vaugahan, 2017).

**Self-regulation.** In the literature focused on WBL, self-regulated learning perspectives have shifted the focus of educational research to apprentices' personally initiated strategies that improve learning and outcomes and environments (Pylavas et al., 2018). According to Pylvas et al. (2018), self-regulation refers to the process in which self-generated thoughts, feelings, and actions are planned and systematically adapted to further one's learning and motivation. Self-regulated learning is not only limited to academic contexts, but also workplace context (Kaplan, 2008; Pylvas et al., 2018). Self-regulated learning is especially relevant to WBL learning in apprenticeships because research suggests that apprentices are largely responsible for their own learning and must often initiate activities to develop their skills independently (Gurtner et al., 2011; Hill & Dalley-Trim, 2018; Nielson, 2008; Reegard, 2011, 2015; Virtanen et al., 2014; Virtanen & Tynjala 2008). Understanding the help-seeking behavior of young working adults is important to enable workplace environments that construct and provide the best possible support for apprentices during their transition from school to work (Corney & du Plessis, 2010).

The three main elements of self-regulation that predict successful learning in the workplace are volition, motivation and self-reflection (Pylvas et al., 2018). *Volition* includes persistence; the will to learn; endeavor/effort; mindfulness in learning; intrinsic regulation; and evaluation processes. *Self-reflection* enables individuals to evaluate their experiences and thought processes and helps the learner to identify the best learning strategies in a given situation. *Motivational* processes help the learner to formulate decisions and to promote decision-making, whereas volitional processes guide one's subsequent implementation of the decision (Pylvas et al., 2018). *Intrinsic motivation* refers to the innate propensity to engage one's interests and exercise one's capacities, and further, to seek and conquer optimal challenges,

whereas *extrinsic motivation* hails from the aid of extrinsic rewards or environmental controls (Deci & Ryan, 1985; Pylvas et al., 2018).

Apprentices must often initiate activities to develop their skills by themselves, developing skills centered around self-regulation, self-sufficiency, and self-monitoring (Gurtner et al., 2011; Hill & Dalley-Trim, 2018; Nielson, 2008; Reegard, 2011, 2015; Virtanen et al., 2014; Virtanen & Tynjala 2008). The apprentices' self-regulation skills such as responsibility and the ability to take initiative and actively seek guidance, affect how guidance is afforded to the apprentice during WBL activities (Filliettaz 2011; Koskela & Palukka 2011; Onnismaa, 2008). A study conducted by Laurent Filliettaz (2011) in Switzerland categorizes self-regulation as help-seeking behavior and suggests that help-seeking behavior allows apprentices to seek both guidance from their mentor and other resources in the workplace environment. Apprentices must take initiative to get a comprehensive learning experience, as mentors usually help when necessary and provide a high level of autonomy to apprentices (Conway & Foskey, 2015; Duemmler, Felder, & Caprani, 2017). Furthermore, it is critical that apprentices are also self-reflective or have the ability to identify and characterize what they are already able to do, understand, or feel and how to learn what they do not yet know; this competency is a major predictor of learner success (Hattie, 2009; Pylvas, 2018).

According to the qualitative study conducted by Pylvas et al. in Finland (2018), the internal or intrinsic motivational element of self-regulation was related to participants' interest in the field of vocation, their willingness to learn and interest in the development of expertise, as well as their initiative and positive attitude. Apprentices' willingness to engage in what the workplace affords is an often-overlooked factor that has major influence on the workplace learning experience. An apprentice may not know what the workplace affords if the apprentice is



not willing to engage. Apprentices must also be willing to be open and trusting to their mentor to begin to develop the robust relationships necessary for productivity to occur in the workplace (Kenny et al., 2015). Furthermore, since learning through work is a sociocultural experience, apprentices must be willing to engage in the social environment and community of practice that the workplace affords (Billett, 2014; Filliettaz, 2011).

The intrinsic motivational element of self-regulation is also relevant to apprentices who enter apprenticeship programs with clarity of their life and career goals. When apprentices have deliberately chosen the career of an apprentice in a specialty, they are more likely to show a willingness to engage in workplace activities (Chan, 2014). Moreover, apprentices' deliberate career choice and previous work experience support their motivation and engagement in the workplace learning (Chan, 2014). This is also true for apprentices who have previous work experience that is similar to their apprentice work. When apprentices know what they want to do and what they want to be, and the learning aligns with current work, their motivation to engage in the work increases (Hill & Dalley-Trim, 2018). Knowing this also helps apprentices articulate their needs and wants to their WBL mentor so that their learning and development aligns with their future career and life aspirations.

The internal motivation aspect of self-regulation is also related to apprentices' ability to have a positive attitude toward their work, which shapes WBL. Apprentices are more likely to experience a quality WBL experience if they have a positive attitude and are committed, enthusiastic, and/or passionate about their job (Hill & Dalley-Trim, 2018). It is also true that apprenticeships do afford apprentices with autonomy and work-based learning opportunities, and the likelihood of an apprentice engaging with workplace learning is based on the apprentice's attitude toward the work.

**Personal relationships.** The literature review highlights apprentices' personal relationships as a factor shaping self-regulation or self-helping behavior, and thus positively shaping their WBL experiences. In the literature, a "significant other" is anyone who plays a supportive or constructively significant role in the life of an apprentice and can include parents, friends, and romantic partners (Corney & du Plessis, 2010). A family member that has confidence in the apprentice's capacity to succeed or an understanding romantic partner who is supportive of the work commitment improves an apprentice's ability to engage in the work and be productive (Chan, 2014; Corney & du Plessis, 2010; Hill & Dalley-Trim, 2008). Other studies also include supportive friend groups as an important source of psychological comfort, leading to learning in the workplace (Chan, 2014; Corney & du Plessis, 2010). Furthermore, previous research into the importance of significant others for at-risk apprentices (du Plessis et al., 2009; Feeney & Bozeman, 2008) suggests that bolstering existing relational networks through the provision of structured and formal support networks may prove fruitful in improving physical, psychological and career-related outcomes for apprentices in industry (Corney & du Plessis, 2010). Lastly, the presence of supportive social relationships is a significant factor in increasing apprentices' likelihood of displaying help-seeking behavior in the workplace, thus achieving an enriching learning environment (Corney & du Plessis, 2010). Facilitating and strengthening apprentices' ties to existing support networks benefit not only apprentices in terms of improved physical and psychological health, but also employers in the form of higher apprenticeship completion rates and improved retention rates for skilled workers (Chan, 2014; Corney and du Plessis, 2010; du Plessis et al., 2009; Feeney & Bozeman 2008; Hill & Dalley-Trim, 2008) . Ultimately, there is no substitute for naturally occurring support such as caring family, close friends, and community support (Corney & du Plessis, 2010).

**Occupational identity.** Occupational Identity is another individual factor that shapes how apprentices engage with WBL and continues to be important for the construction of work identities (Stokes & Wyn, 2007; Skorikov & Vondracek, 2011). During apprenticeship training, apprentices acquire technical and theoretical knowledge, skills, and competencies that allow them to become knowledgeable of the social norms, values, codes, habits, and rules that characterize their occupational domain and the world of work in general (Duemmler, Felder, & Caprani, 2018). This learning process not only leads to a transformation of apprentices' knowledge, practical and social skills; it is also intimately related to the construction of their occupational identities (Duemmler et al., 2018). The concept of occupation identity has been developed from theoretical orientations to grasp a range of phenomena related to work and can be defined as how individuals construct and negotiate themselves in workplace settings through subjective meaning-making in regard to work experiences (Duemmler et al., 2018; Zittoun, 2016). Apprentices do not easily adopt the occupational identity required by their work context; instead, they actively negotiate it to find a balance with their interests, dispositions, and ambitions (Duemmler et al. 2017; Zittoun, 2016). The highly dynamic character of occupational identities resides mainly in two interwoven identity dimensions: the personal image that individuals have of themselves as professionals and assert against others is dialectically related to the social image that others (WBL mentors, peers, supervisors, etc.) attribute to them (Duemmler et al., 2017). Furthermore, identities are constructed in relation to the past socialization with family, and present and future career projections (Duemmler et al., 2017).

Overall, occupational identities shape WBL experiences for apprentices. When apprentices develop limited occupational identities, they seldom project themselves into the future in that particular occupation, and they anticipate either leaving the sector or moving up

within the sector with better work conditions, including stable schedules and more recognition (Duemmler et al., 2017). According to a study in Switzerland (Duemmler et al., 2017), apprentices' occupational identification is profoundly related to the societal perception of their learning and working in a low-prestige occupation. Even though the apprentices in their study did not internalize the negative image of their low-prestige work, they did anticipate leaving the occupation or at least getting promoted within it. Ultimately, occupational identity shapes the way apprentices engage with their work and even see themselves in the industry long-term.

### **Institutional-level Factors**

Workplaces provide vastly different learning experiences and potential for learning, based on a number of factors within their particular workplace environment (Nijhof & Nieuwenhuis, 2008). The learning potential of a work environment is reflected in factors that determine the likelihood that learning processes will occur in a particular job situation and from a workplace perspective (Billet, 2014). Thus, institutional-level factors can be characterized by the factors that predict the learning potential the workplace affords to the apprentices. Evidence from the literature review suggests that the most influential institutional-level factors shaping WBL in apprentices are skilled personnel, guidance with autonomy, positive and meaningful relationships, and a culture of continuous learning.

**Skilled personnel.** The literature review provides evidence that skilled personnel with strong pedagogical skills are more likely to provide apprentices with quality learning experiences (Chan, 2014; Corney & du Plessis, 2010; Hill & Dalley-Trim, 2008). Pedagogical skills influence the way in which experienced workers are able to share their knowledge with apprentices and the way workplaces are able to afford participation in productive tasks and quality learning experiences at work (Filliettaz, 2011). One of the most cited pedagogical

strategies highlighted in the literature was scaffolding. Nielsen (2008) defines scaffolding as “a process whereby beginners in a profession are supported by experienced workers so as to improve their basis or participating in a social practice” (pg. 247). Moreover, scaffolding includes the gradual withdrawal of support as the beginner’s skills improve (Filliettaz, 2011; Nielsen, 2008). During scaffolding in WBL, the apprentice is introduced to new areas of the profession and invited to take over an increasing part of the production process (Nielsen, 2008).

The notion of scaffolding is influenced by Vygotsky’s (1978) ‘zone of proximal development,’ which is understood as the distance between the actual development level, as determined by independent problem solving, and the level of potential development as determine through problem solving under guidance or in collaboration with more capable peers (cited in Nielson, 2008). Within this perspective, a more knowledgeable other plays a necessary role in supporting the learning process (Nielsen, 2008). Most often the more knowledgeable other is a teacher who “structures the interaction by building on what he or she knows the learner can do and gradually closing the gap between the task requirements and the learner’s level of skills” (Nielson, 2008, pg. 248).

The literature suggests that when implemented with fidelity, scaffolding enhances WBL in apprentices and is instrumental in the identity formation of the apprentices and identity formation is understood as a part of socially situated practice in which the apprentice participates, and, by doing so, receives recognition and develops a sense of belonging to the community of practice (Nielsen, 2008). Nielsen (2008) describes the scaffolding process: the apprentices are first introduced to the whole process, and then deals with the nearly finished product, which requires only minimal decoration. Working with the final product provides the apprentice with a sense of direction: where the process will end, and how the product should

look and by reversing the production process, the master makes the different aspects of the process stand out, and creates a situation in which mutual reflection is possible (Nielsen, 2008). Learning to become part of a workplace community of practice is related to the process of the apprentice being recognized by the other participants as an important and trustworthy future baker, for example, and by developing a sense of collective ‘we’ narrative in the bakery (Chan, 2015; Moon, 2018; Nielsen, 2008). Furthermore, the apprentices gain self-confidence when the more experienced participants at the workplace devote time and energy to instructing them. A central reason for applying scaffolding instruction in a workplace context is its potential for communicating bodily know-how embedded in social practice (Nielsen, 2008).

Skilled personnel must also provide opportunities situated learning, another major instructional design choice that enhances WBL in apprenticeships. In the workplace, learning cannot be separated from doing, which indicates that learning is situated in context and culture. The social and cultural processes that shape learning should be considered as much as learning itself (Parkinson, Mackay, & Demecheleer, 2018). Situated learning can be described as allowing opportunities for apprentices to encounter, on a regular and recognized basis, new situations, problems and ‘events’ in and by which they can learn about new methods, technologies or products (Onstenk, 2017). Situated learning is more self-directed and individual-focused than organizational learning, but at the same time, it also encourages the learning of groups, teams or communities (Parkinson, Mackay, & Demecheleer, 2018). Situated learning, as a supplemental instructional technique during WBL, leads to strong identity formation as central parts of learning a trade and becoming a member of a community of practice (Nielsen, 2008). As the learning context is situated in the workplace, apprentices will learn knowledge, skills, and cultures through various informal learning activities such as storytelling, scaffolding, sharing

ideas, and coaching (Moon, 2018). Situated learning also helps apprentices develop soft skills such as the ability to work within a team to solve problems (Vaughan, 2017). Another aspect of situated learning that is important to note in the literature is WBL mentors being able to create situations that allow apprentices to connect theory and practice. Learning in the workplace should not be separated from learning through traditional classroom teaching but should be related to it (Virtane & Tynjala, 2008). Furthermore, in order to obtain optimal learning outcomes abstract codified knowledge acquired in vocational school has to be connected to actual practice in a specific workplace (Onstenk, 2010; Virtane & Tynjala, 2008).

Lucas and Spencer (2015) highlight the movement from novice to expertise involves a significant amount of time engaged in deliberate practice, which is not only the amount time spent on task, but also targeted, strategic engagement in the process. On the other hand, without situated learning, apprentices fail to learn to display an authentic identity, which can lead to marginalization of the apprentice (Filliettaz 2010; Holmes & Woodhams, 2013). Situated cognition helps knowledge transfer to a real-life situation; thus, learning is based on the context. In this way, situated learning is similar to organizational learning in that learning occurs through experiences and transfer of knowledge (Parkinson, Mackay, & Demecheleer, 2018).

Another pedagogical skill highlighted in the literature as influential is the workplace mentor's ability to manage performance using feedback and reflection through effective guidance and coaching (Chan, 2017; Kenny et al., 2015; Zhao, Seifried, & Sieweke, 2018). According to Chan (2017), good coaching should include the entire feedback cycle; the coach should assist the learner to: recognize if apprentices are on the right track (feed up); provide commentaries on the learners' performance (feedback); and assist the learner to assess what needs to be worked on further (feed forward). Through imitative learning, the benefits of guided

learning are further enhanced through the deployment of effective feedback (Chan, 2017). Focused feedback from the apprentice through self-reflective processes and from others provides feed forward for improvement of practice (Chan, 2017). Moon (2018) also posits that apprenticeship through inviting self-reflection can provide sound feedback to apprentices in which they can grow through re-evaluation of their own capacity toward professional development.

**Guidance with autonomy.** The literature supports the notion that guidance is one of the most influential institutional factors shaping WBL, mainly because workers do not learn on their own or just by completing activities and tasks; they can do so when specific resources are afforded to them (Fillettaz, 2011). Virtanen, Tynjälä, and Eteläpelto (2014) suggests that the opportunity for an apprentice to receive individual guidance seems to be the most important factor in producing successful workplace learning outcomes. However, the literature also suggests that too much guidance is detrimental to the learning and development of an apprentice (Fillettaz, 2011), explaining that the workplace must strike a balance between affording enough guidance and also providing autonomy.

In a general sense, guidance is defined as a process during which more experienced workers and novices work together; novices work under the surveillance of experts, while experts monitor the work of the students and provide help if needed (Fillettaz 2011; Koskela & Palukka, 2011; Onnismma, 2008). Guidance from the workplace comes from a more collective perspective and claim that WBL mentors are not the only ones providing learning with guidance; peers, experts, and supervisors also interact with apprentices while they engage in workplace activities (Corney & du Plessis, 2010; Fillettaz, 2011). Fillettaz (2011) breaks down the concept of guidance even further, suggesting that there are two forms of guidance, indirect and direct



guidance. Indirect guidance is defined as physical arrangements or various symbolic resources accessible through observation within professional environments and direct guidance refers to close interactions involving skilled and experienced co-workers (Filliettaz, 2011). Direct and indirect forms of guidance provided by experienced workers constitute important conditions for the learning potentialities of specific work environments (Filliettaz, 2011).

Ultimately, guidance is an important condition for expanding the zone of proximal development (ZPD) and for developing problem-solving skills. The Vygotskian concept of the zone of proximal development is defined as ‘the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult *guidance* or in collaboration with more able peers (Vygotsky, 1978, pg. 85 cited in Filliettaz, 2011). Furthermore, learning and development involves close interactions with the cultural environment and with more experienced individuals, and thus occurs with guidance. Guidance is seen as an important means by which experienced workers assist newcomers in their ordinary tasks and shape the ways they participate in collective practices. Moreover, it leads to increased participation and to the recognition of the apprentice as legitimate members of the work team (Filliettaz, 2011). When apprentices participate in collective practices, their identity begins to shape and transform; under specific conditions, newcomers are progressively recognized as members of communities of practice as they move from peripheral to full participation (Filliettaz, 2011). Furthermore, collective guidance may also afford rich opportunities for learning by providing apprentices a wider range of conceptual, procedural and dispositional knowledge related to the tasks at hand.

On the other hand, guidance can also shape WBL in the opposite direction. Guidance can also marginalize the role of apprentices and leave them unprepared for coping with the complex

and dynamic body of knowledge underlying professional communities (Corney & du Plessis, 2010; Filliettaz, 2011). Guidance can also lead to confusion when discrepancies emerge between experts or when important dimensions of the tasks remain implicit (Corney & du Plessis, 2010; Filliettaz, 2011). Though guidance is highlighted in the literature as a major institutional factor that shapes WBL in apprenticeships, too much guidance can hinder the learning and development of apprentices. Therefore, it is important to afford apprentices some level of autonomy.

According to a research study in Switzerland (Duemmler, Felder, & Caprani, 2017), affording responsible autonomy is a precondition for a worker's learning an occupation and is important to self-esteem. Autonomy allows apprentices to take lead on their learning and development, which mentors can facilitate by giving apprentices the freedom and responsibility to assert themselves (O'Donovan, 2018). When apprentices reported factors that impacted their learning experience, they reported negative experiences with not being allowed to work independently and having to depend heavily on WBL mentors; apprentices felt like this kept them from being productive members of the work team (Duemmler et al., 2017; O'Donovan, 2018). Autonomy can boost work satisfaction and occupational identification because it is a sign of confidence in apprentices' skills (Reegard, 2015).

**Positive and meaningful relationships.** Workplace environments must provide mentors who care about apprentices beyond being an employee with the company, they must care about them as a young adult in the world. A study in Australia attributed one of the contributing factors to apprentices leaving apprenticeships was a failure of workplace mentors to give acknowledgement of the apprentice as a person (Conway & Foskey, 2015). Furthermore, when apprentices' experiences were examined, failed learning experiences were characterized by

instructors' inability to acknowledge students' needs and capabilities outside of the apprenticeship setting, which led to apprentices being unable to create meaningful connections between content and their future development in the trade (Conway & Foskey, 2015). Learning is more effective when both instructors and mentors relate to apprentices on a personal level and discuss things such as college or life planning, as relationship quality and caring are keys to success and sustainability of mentor-apprentice relationship (Kenny et al., 2015). Individual guidance seems to be the most important factor in producing successful workplace learning outcomes, and Conway & Foskey (2015) suggests a focus on the interpersonal relationships between apprentices and mentors is vital to work-based learning. They even assert that poor relational supervision contributes to the apprentices' loss of vitality (Conway & Foskey, 2015). Poor interpersonal relationships lead to poor psychosocial work environments and, thus, an apprentice who languishes in the workplace because the relational resources and positive meaning are necessary to thrive (Niessen, Sonnentag, & Sach, 2012). The quality of peer relationships also emerged as a crucial aspect of apprentices' learning engagement. Furthermore, social relational dynamics at work can promote or inhibit apprentices' development (Conway & Foskey, 2015).

**A culture of continuous learning.** Culture is another factor that shapes the implementation of WBL in apprenticeships. Apprentices' learning is embedded in 'doing' in the workplace; therefore, they will learn through trial and error on the job (Moon, 2018). The literature suggests that it is the responsibility of the workplace mentor to provide a structured learning environment and workplace culture centered on using failure as an opportunity for learning or error management (Cortini, 2016). Mentors can support apprentices' learning by offering feedback and assistance without exhibiting negative responses to errors (Cortini, 2016;

Zhao, Siefried, & Sieweke, 2018). Moreover, mentors must exhibit positive reactions to error; otherwise, apprentices will not feel motivated to engage in learning (Zhao, Siefried, & Sieweke, 2018). It is also important for the employer's leadership team to make sure there is consistency between mentors' responses and the error climate within the workplace, essentially holding the mentors' accountability for cultivating an environment that uses failure as learning opportunities. An example of this strategy is an organization that might make the space for regular meetings in which apprentices discuss and analyze errors to facilitate learning (Zhao, Seifried, & Sieweke, 2018).

The literature also suggests that offering apprentices opportunities to work and learn collectively with other apprentices and workers within the workplace increases the quality of learning for apprentices. The amount of collective and mutual learning is essential to the workplace's vibrant community of practice (Onstenk, 2017). Offering a community of practice that fosters collaboration and social learning enriches work-based learning and allows students to socialize into the occupation and workplace. Creating communities of practice or collaborative spaces provides formal and informal support for apprentices and allows for an enriching learning experience as well as a way for apprentices to develop a sense of belonging in the workplace. Providing communities of practice also means that workplace guidance can be implemented from a more collective perspective in which mentors are not the only individuals providing learning with guidance. This concept is known as collective guidance and is characterized by other colleagues, experts, and workplace managers being given the opportunity to interact with apprentices while they engage in their work tasks (Filliettaz, 2011). Even more importantly for young apprentices, effective learning may come from guidance from fellow apprentices, which is also known as peer mentoring, using the supportive networks young people naturally build

within their work contexts (Corney & du Plessis, 2010; Filliettaz, 2011). One way the literature suggests that communities of practice in workplaces can be strengthened to produce better learning outcomes with apprentices is to make relevant information available to apprentices in the form of databases, handbooks, manuals, or even embedded in the physical work environment (Onstenk, 2010).

### **WBL and Sociocultural Learning Theory**

The two main actors in the implementation of WBL are the apprentice and the WBL mentor. The literature suggests that the WBL mentor guides the apprentice to use their formal theory in practice, transforming it into professional craft knowledge in the practice setting, while the apprentice transfers that learning into their own framework for understanding their practice (Manley et al., 2009). This type of interaction highlights the theoretical underpinnings that exist within the WBL approach. The theoretical underpinnings of WBL in apprenticeships are centered in sociocultural learning theory. Sociocultural approaches to learning emphasize the interdependence of social and individual processes in the construction of knowledge (John-Steiner & Mahn, 1996) and focus on the role of interaction, context, and culture has on learning (Manley et al., 2009). Sociocultural approaches are based on the concept that human activities take place in cultural contexts, are mediated by language and other symbol systems, and can be understood when investigated in their historical development (John-Steiner & Mahn, 1996). Furthermore, sociocultural approaches posit that knowledge is socially constructed (Bleakely, 2002); legitimate roles to participate in work-based community of practice must be found (Bleakely, 2002; Lyon 2004); and that legitimate peripheral participation, scaffolding and the zone of proximal development are useful in designing facilitation of WBL (Spouse, 2001; Walsh et al., 2002).

Furthermore, learning is scaffolded by a mentor who first identifies what the student needs to know (Vygotsky's zone of proximal development), and then guides them using interpersonal talk through aspects of a procedure with the student is unfamiliar (Spouse, 2001). Vygotsky's unique concept of zone proximal development states that cognitive development stems from social interactions from guided learning as the student and partner co-construct knowledge. He posits "an essential feature of learning is that it crease the zone of proximal development; that is, learning awakens a variety of internal developmental processes that are able to operate only when the child is interacting with people in his environment and in cooperation with his peers." (Vygotsky, 1978, pg. 35).

Spouse (2001) suggests that sociocultural approaches clarify the complex interactions concerned with facilitating and acquiring professional craft knowledge. The WBL mentor guides the learner to use their formal theory in practice, transforming it into professional craft knowledge in the practice setting and the learner then transfers their learning into their overall framework for understanding their practice (Hall & Walsh, 2002). Learning, specifically in apprenticeships, is what takes place in the zone of proximal development, where WBL mentors guide, assist, support, and coach the apprentices (Morris, Blaney, & Swanwick, 2010). Furthermore, it is important for WBL mentors to both, recognize what apprentices can do independently and to work out how to scaffold apprentices' learning so that they can move forward (Morris, Blaney, & Swanwick, 20100). Ultimately, Vygotsky suggests that learning such on-the-job training in apprenticeships, requires effective social interactions between the learner and facilitator. Sociocultural approaches and Vygotsky's theories of learning and development permeate throughout WBL and serve as the theoretical underpinnings for WBL in apprenticeships.

## Discussion

As WBL becomes increasingly relevant because of the skills gap, organizations that are training the next generation of workers will need to continuously learn about WBL and best practices related to its implementation. The purpose of this literature review was to identify and describe empirically discovered influential factors that shape the implementation of WBL in an apprenticeship context. The literature review suggests that there are both individual-level and institutional-level factors that shape WBL in apprenticeships as well as critical factors that are involved in WBL implementation. In addition, there are certain theoretical underpinnings that guide the WBL strategy.

The findings from the literature describe the individual and institutional factors that shaped WBL in apprenticeships around the world. The literature review reveals that there are elements that apprentices bring into the workplace even before the work begins and are factors that the workplace cannot necessarily train for. These elements are known as individual factors that shape WBL for apprentices. Prior non-technical skills, self-regulation, personal relationships outside of work, and occupational identity are factors that shaped apprentices' willingness to engage and ability to focus to learn new technical skills. Ultimately, apprentices are just as responsible for the successful implementation of WBL in apprenticeships as the workplace.

Furthermore, if apprentices are unwilling to engage in what the workplace affords, successful implementation does not occur. These findings in the literature are also align with Stephen Billet's (2001, 2002, 2006, 2011, 2014) work regarding workplace affordance and an individual's willingness to engage with what an employer affords. Billett (2002) asserts that individuals' agency influences how they elect to participate in work activities, as well as interpret and respond to the affordances of the workplace. Billet also suggests that learning new

knowledge is effortful and interpretative, and thus how individuals engage in work activities and interpret the worth of that participation will also influence the quality and nature of their learning.

Successful implementation of WBL in apprenticeships is also based on what the workplace affords to the apprentice, specifically the WBL mentor. The literature review suggests that it is important to provide apprentices with skilled personnel, guidance with autonomy, positive and meaningful work relationships, and a culture of continuous learning. According to Billet (2001), “How workplaces afford opportunities for learning, and how individuals elect to engage in activities and with the support and guidance provided by the workplace, is central to understanding workplaces as learning environments” (pg. 2).

### **Implications for Further Research**

Most of the research in this literature review is derived from countries outside the United States such as Switzerland, Finland, New Zealand, and Australia. Moreover, there is a need for qualitative and quantitative research related to the implementation of WBL in apprenticeships in the United States. As previously noted, employers in the U.S. are having difficulty filling jobs due to a widespread skills gap (Cappelli, 2015; Lowry & Thomas-Anderson; Manufacturing Institute, 2018; Robertson & De Aquino, 2016). Furthermore, relevant research around recruitment, training and development, and retention would be beneficial in the context of U.S. apprenticeships to help replenish a depleting and aging workforce.

The two major roles in the implementation of WBL are the WBL mentor and the apprentice. Workplace mentors are responsible for most of the institutional factors that shape the successful implementation of the core components of WBL in apprenticeships. Therefore, a greater understanding of their experiences and identity formation is needed. According to the



literature, it is important for the WBL mentor to be someone who develops young adults through positive interpersonal relationships as well as a manager who corrects mistakes and holds apprentices accountable for developing both technical and non-technical skills in the workplace. Furthermore, rigorous qualitative research is needed to gain a deeper understanding of the processes through which these WBL mentors develop their capacities to handle the complexities of their role. Also, research is needed that focuses on the way employers choose WBL mentors and prepare them to get the most out of their apprentices. As stated in the literature, there exists no agreement on how WBL should be facilitated by WBL mentors in the workplace. Moreover, each WBL mentor facilitates learning in the workplace based on their own interpretations of both WBL and their roles and responsibilities. Therefore, research exploring the factors that shape these interpretations will be important to help researchers and practitioners of WBL gain a better understanding of the actions of WBL mentors.

Further research exploring the experiences of apprentices, the individuals who are responsible for the actual implementation of the WBL in both a workplace environment and in the classroom, is also needed. The literature review suggests that apprentices bring both previous experience and agency with them to the apprenticeship, and that those individual factors shape the way apprentices engage with the WBL mentors and the workplace. According to the literature review, learning through work is a social experience, and apprentices must be willing to engage in the social environment and community of practice of the workplace in order for quality WBL to occur. Therefore, there is a need for research around how apprentices engage in WBL and to gain a deeper understanding of what shapes that engagement. This research can lead to insights about why apprentices in the U.S. decide to persist or leave apprenticeship programs

and the conditions that employers must create to ensure apprentices stay with the company long-term.

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**CHAPTER 3: Exploring the Roles and Responsibilities of Mentors During the  
Implementation of Work-Based Learning in North Carolina Apprenticeships: A Multi-Site  
Case Study (Study 2)**

Work-based learning (WBL) mentors are individuals, from employers to educational partners, who implement WBL in apprenticeships and shape apprentices' overall learning experiences. WBL mentors play an important role in apprentices' overall experiences and in preparing and equipping them with the resources needed to make them successful (Billett, 2004). The modern relationship between WBL mentors and apprentices stems from the middle ages where similar practices had emerged in western Europe in the form of craft guilds. Guild members supervised the overall production of goods and the recruit, or apprentice, was able to enter the guild after completing appropriate training. Throughout history, this method of training and developing workers has proven to be an effective way to maintain the production of goods and services in countries such as Austria, United Kingdom, Switzerland, Czech Republic, Canada, France, Germany, and the United States.

The United States is currently experiencing a phenomenon known as the skills gap crisis, where there are millions of jobs that are vacant because workers do not have the skills to fill them (Bridgeland, Milano, & Rosenblum, 2011; Holzer, 2015; Kochan, Finegold, & Osterman, 2012; Levesque, Lauen, Teitelbaum, Alt, & Librera., 2000; Winchester-Seeto, Rowe, & Mackaway, 2016). This has been the result of rapidly changing skills requirements and technological advances in industries such as healthcare, information technology, construction, and advanced manufacturing. Subsequently, employers in industries most affected by the skills gap crisis have taken a specific interest in using apprenticeships to develop skilled workers. Furthermore, the role of the workplace mentor in guiding the development of skilled apprentices

has also become increasingly important (Billett, 2003; Boud & Garrick, 1999; Evanciew & Rojewski, 1999).

Though the roles and responsibilities of WBL mentors are becoming increasingly important, limited research exists regarding the overall experiences of workplace mentors (Billett, 2003; Boud & Garrick, 1999; Evanciew & Rojewski, 1999; Kenny et al., 2015; Poortman, Illeris, & Nienwenhius, 2011). The use of a sensemaking framework was sparked from Coburn's 2005 study that suggested that action was based on how people notice or select information from the environment, make meaning of that information, and then act on those interpretations and developing culture, social structures, and routines. Therefore, understanding how workplace mentors make sense of their role can help WBL researchers and practitioners understand mentors' routines and actions, and, ultimately, their ability to successfully implement work-based learning activities in apprenticeships. It can also illuminate the tacit knowledge possessed by mentors and the insider perspective in identifying systems failures that often manifest in barriers to implementation (Tran et al., 2017) and factors that enhance the work-based learning experience for themselves and apprentices.

This study explores, examines, and describes how WBL mentors in NCTAP interpreted their roles and the factors that shape those interpretations. This study was guided by sensemaking theory and analysis involved open coding to identify emergent themes. Data from this study were drawn from interviews, field notes, and relevant documents. The following research questions guided this investigation:

1. How do WBL mentors interpret their roles and responsibilities in implementing WBL in an apprenticeship program?

2. Which individual and institutional factors shape WBL mentors' overall interpretation of their roles and responsibilities in implementing WBL in an apprenticeship program?

This study ultimately has the potential to advance theory and practice related to the selection and preparation of mentors in WBL programs and help mentors become clear about WBL and their role in guiding and implementing the learning strategy in the workplace (Kenny et al., 2015; McIntosh et al., 2014).

### **The Role of the WBL Mentor**

In a traditional apprenticeship model, apprentices participate in an apprenticeship for two to four years with combined on-the-job training and related instruction while making a progressive wage. The type of learning that goes on in on-the-job training in the workplace is mediated by key individuals known as workplace mentors. These key individuals or stakeholders help students relate theory to practice; in addition, they are responsible for the way the work placement is conceived, planned, and supported to provide students with a quality experience of working in a professional environment (Martin, 1997). Though there exists no formal agreement among practitioners and researchers about the roles and responsibilities of WBL mentors, research suggests that the fundamental roles of the workplace mentor are to facilitate learning and skills development while increasing engagement to produce a highly skilled apprentice by the end of the program.

### **Learning and Skill Development**

Workplace mentors are ultimately responsible for developing apprentices into skilled workers who can meet the needs and demands of the workplace environment. The workplace mentor is a skilled craftsman who affords the apprentice the opportunity to acquire both explicit and tacit knowledge of the trade through years of co-participation. Workplace mentors guide



learners in an active learning process that promotes higher-order thinking skills as the learners are doing and thinking about their practice in the midst of a complex workflow (Lankau et al., 2006). Workplace mentors foster the learning and mastery of technical skills by assisting the apprentice in using prior knowledge, work experience, academics, life context, and their interests to meet their learning needs (REF?). The ability of workplace mentors to provide the kind of mentoring and structured workplace learning experiences necessary for effective learning is one of the major drivers of successfully implementing WBL (Cornford & Gunn, 1998). According to Boud and Costley (2007), skills development and learning occur when workplace mentors act as facilitators, advisors, and expert resources as opposed to acting in a more traditional role as discipline-bounded experts. Chisholm, Harris, Northwood, and Johrendt. (2009) believe that workplace mentors should facilitate suitable learning environments, encourage reflection, and ensure proper support has been given throughout the learning process. Workplace mentors also have a responsibility to foster employability skills such as soft skills and dispositions. Workplace mentors rely heavily on instructional techniques such as modeling, coaching, and scaffolding strategies to assist their apprentices in learning the processes and tasks associated with their work (Evanciew & Rojewski, 1999). Mentors assess the performance of apprentices as the key tool to identify learning needs and ensure regular and targeted feedback (Morris, Blaney, & Swanwick, 2010).

### **Engagement**

Another role of workplace mentors are to foster engagement in apprentices; mentors foster engagement by building relationships with apprentices, facilitating workplace affordance and co-participation in the learning environment, and helping apprentices to establish a sense of belonging to a workplace. Workplace activities and individual engagement are the constitutional

factors affording learning (Billett, 2002). The first step to engaging apprentices, includes mentors establishing a sense of trust, actively listening, and providing structures to the learning environment, expressing positive expectations, advocating for the learner, and sharing experiences with the learner (Carelson et al., 2003). In this step, the mentor builds a genuine and authentic relationship with the apprentice. Also, during this time, mentors acknowledge specific workplace cultures and practices to help apprentices make sense of their initial experience (Morris, Blaney, & Swanwick, 2010).

Stephen Billett (2001), a researcher credited with exploring the co-participation of workplace affordance and individual engagement, suggests that the workplace's readiness to afford opportunities for individuals to engage in work activities with both direct and indirect support is a key determinant of the quality of learning. It is the responsibility of the workplace mentor to encourage this co-participation in work activities. Mentors help apprentices find meaning in their work activities because, according to Billett (2001), "individuals need to find meaning and worth in what is afforded for them to participate" (p. 6). It is also important for the mentor to understand the inevitable negotiation between the workplace's norms and practices and the apprentices' subjectivities and identities that will intersect during participation (Billett, 2004). If their subjectivity is ignored, individuals may elect to dis-identify with social practices in the workplace and resist engaging in work-based learning. Poor working conditions, lack of workplace support for learning, and a failure by the mentor to provide training are reasons for apprentices discontinuing work-based learning programs such as apprenticeships; it is, therefore, the responsibility of the mentor to afford these elements within the workplace (Cully & Curtain, 2002).

A sense of belonging to a workplace is an important precursor for apprentices' initial and ongoing engagement with communities of practice, or in this context, the workplace (Chan, 2016). For apprentices, the need to establish either a sense of belonging to a workplace (Chan, 2013) or an affinity to a trade's culture of practice (Corradi, Gherardi, & Verzelloni, 2010) through processes of learning as belonging may be prerequisites to establishing vocational identity as trade workers and increased engagement (Chan, 2011). One way mentors help apprentices establish a sense of belonging is to orient them to the physical organization and to its human resources (Price, Graham, & Hobbs, 1997). Mentors' providing emotional caring, instrumental support, guidance, and a focus on growth are other key qualities that help apprentices establish a sense of belonging in the workplace (Bennett, 2007; Linnehan 2001, 2003). The following section explores sensemaking the main characteristics of sensemaking and describes it as a theoretical framework for the study. Sensemaking is thus used as a framework for understanding how mentors, themselves, make sense of their roles as mentors.

### **Sensemaking as a Theoretical Framework**

To get an in-depth understanding of how mentors interpret their roles in WBL and the factors that shape their interpretation, the study was guided by a *sensemaking* framework. A deeper understanding of how mentors make sense of their role was obtained from participants' existing knowledge and their framing, constructing, and interpreting the meaning of WBL implementation (Spillane, Reiser, & Reimer, 2002). Empirical studies, guided by a sensemaking theoretical framework, suggest that action is based on how people notice or select information from the environment, make meaning of that information, and then act on those interpretations, developing culture, social structures, and routines (Coburn 2001, 2005; Spillane, Reiser, & Reimer, 2002; Stensaker, Falkenberg, & Grønhaug, 2008). Therefore, providing a deeper

understanding of how WBL mentors make sense of their role will help researchers understand their routines and actions, and, ultimately, their implementation of WBL in apprenticeships.

According to Weick (1995), “How people construct information, what they construct, why, and with what effects are the central questions for people interested in sensemaking” (p. 4).

Sensemaking has been used to explore implementation in K-12 education and in business, but the interpretive framework has not yet been used in the context of exploring the implementation of WBL. Thus, this study adds to the literature on sensemaking by exploring its implications in WBL implementation.

### **Defining Sensemaking**

Researchers who study the concept often define sensemaking as a cognitive process, but they describe it in different ways. Meryl Louis in 1980 first defined it as “a thinking process that uses retrospective accounts to explain surprises” (cited in Weick, 1995, p. 4). Perhaps the most well-known definition comes from Karl Weick (1995), the father of organizational sensemaking, who first introduced sensemaking as a distinct topic in an organizational context in his 1969 book, *The Social Psychology of Organizing*. In his 1995 book *Sensemaking in Organizations*, he asserts that “the concept of sensemaking is well named because, literally, it means the making of sense” (Weick, 1995, p. 4). Maitlis and Christianson (2014) define sensemaking as the process through which people work to understand issues or events that are novel, ambiguous, confusing, or in some way violate expectations. According to Evans (2007), sensemaking is generally understood to be the cognitive act of taking in information, framing it, and using it to determine actions and behaviors in a way that manages meaning for individuals. Dougherty, Borrelli, Munir, and O’Sullivan (2000) define sensemaking, in an organizational context, as a social process of developing common or shared understanding by organizing information, insight, and

ideas in a meaningful way. The integrated definition of sensemaking for this study is *the cognitive process, mediated through individual and institutional factors, of making sense or meaning out of an ambiguous experience.*

### **Characteristics of Sensemaking**

According to Weick (1995), sensemaking is a process that is (1) grounded in identity construction; (2) retrospective; (3) enactive of sensible environments; (4) social; (5) ongoing; (6) focused on and by extracted cues; and (7) driven by plausibility rather than accuracy.

The first characteristic of sensemaking is that it is grounded in identity construction. Sensemaking begins with the identity of the sensemaker (Weick, 1995) and the sensemaker experiences and begins the sensemaking process internally. Identity is central because it “is at the root of sensemaking and influences how other aspects, or properties of the sensemaking process are understood” (Weick, Sutcliffe, & Obstfeld, 2005, p. 416). In a workplace setting, WBL mentors play several roles and are continually making sense of their work environment, thus who they are as mentors becomes a reflection of their perceived identity.

The second characteristic suggests that individuals make sense of a construct by incorporating past experiences; they use retrospective experience to help construct meaning in their present context. Weick et al. (2005) describe a nurse using retrospect to make sense of symptoms she observes with a patient, explaining that “symptoms are not discovered at 11:00. Instead, symptoms are created at 11:00 by looking back over earlier observations and seeing a pattern” (Weick et al., 2005, p. 412).

The third characteristic focuses on action and asserts that action from an individual or organization is partly responsible for constructing the environment of the system. According to Weick (1995) the “organization literally does something, and once done, that something becomes

part of the environment that the system can draw on to maintain its own internal order” (p. 13). Ultimately, an individual or an organization is not independent of its environment; in fact, they are co-developed by interacting with each other.

The fourth characteristic places sensemaking in a social context. According to Cynthia Coburn’s (2005) research into the sensemaking processes of teachers, teachers’ sensemaking is “influenced by patterns of social interaction with colleagues, the conditions for learning in the school, and local workplace norms that shape the range of appropriate responses and structure priorities (Coburn, 2005, p. 478). Weick et al. (2005) discuss a nurse’s sensemaking being social and, therefore, being influenced by social factors such as “previous discussions with the other nurses on duty, an offhand remark about the infant that might have been made by a parent, interaction with physicians--some of whom encourage nurses to take initiative and some who do not, or the mentoring the nurse received the day before” (p. 412).

The fifth characteristic quite simply describes sensemaking as never starting or stopping, but rather an ongoing process. Sensemaking is ongoing as individuals are always making sense of life as they experience it daily. According to Weick (1993, pg. 635), “The basic idea of sensemaking is that reality is an ongoing accomplishment that emerges from efforts to create order and make retrospective sense of what occurs.”

The sixth characteristic of sensemaking is that it is focused on and by extracted cues, meaning individuals either cue others or are cued by them. Weick (1995) describes cues as structures that give individuals a glimpse of a situation and, subsequently, allow them to use that glimpse to develop a larger sense of what may be happening. People internalize cues or signals to make sense of an experience. Spillane and colleagues (2002) suggest that people generate

what they interpret—they create the environment and select the cues and signals that they interpret.

The seventh characteristic of sensemaking is that it is driven by plausibility rather than accuracy. Weick et al. (2005) insist that sensemaking is not about truth or being accurate; instead, it is about continued redrafting of an emerging story so that it becomes more comprehensive, incorporates more of the observed data, and is more resilient in the face of criticism.

### **Factors Shaping Sensemaking**

In this study, factors that shape WBL mentors' sensemaking were examined and described. Research regarding sensemaking does not occur in an apprenticeship context (Coburn 2001, 2005; Spillane, Reiser, & Reimer, 2002; Stensaker et al., 2008), however it occurs in a workplace environment. Therefore, the learnings from the research can be reasonably applicable to sensemaking in apprenticeships. The literature on sensemaking highlights individual and institutional factors that shape sensemaking in the workplace as shown on Figure 2.2. Figure 2.2 highlights workplace mentors going through the sensemaking process, a process shaped by individual and institutional factors, and subsequently shaping the workplace mentor's actions.

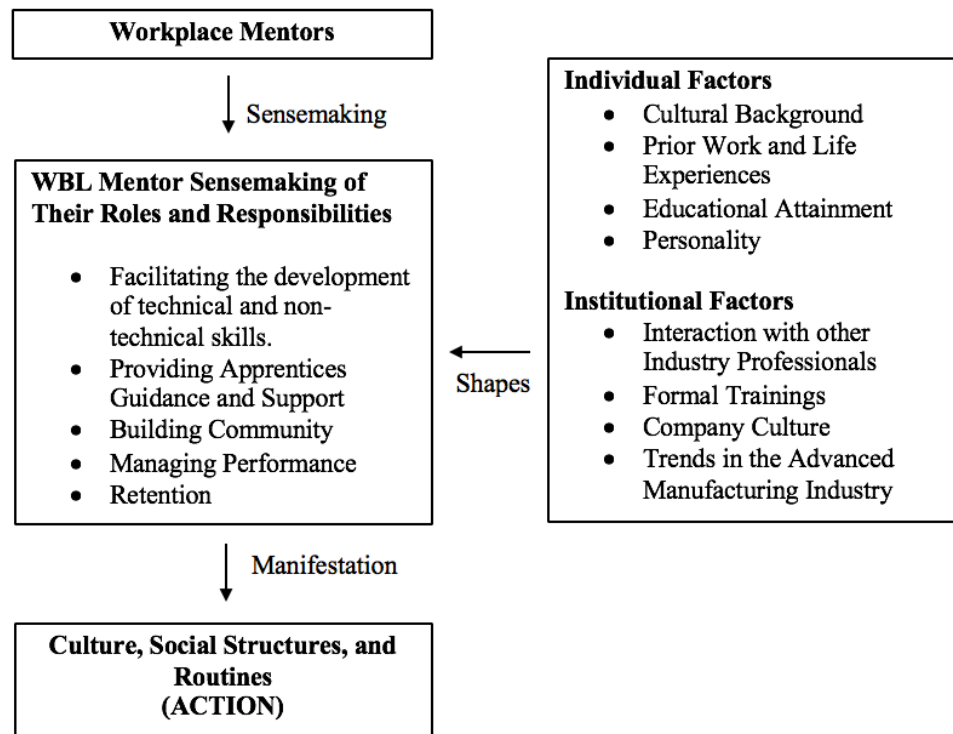


Figure 2.2. Factors that Shape Mentor Sensemaking

Individual factors such as background, interests, and pre-existing knowledge shape sensemaking (Coburn, 2005; Stensaker et al., 2008). Coburn's 2005 study with teachers and school leaders discovered that they draw on their existing working knowledge to interpret new instructional approaches, often reconstructing policy messages in ways that either reinforce pre-existing practices or lead to incremental change. Stensaker and colleagues' (2008) study examined the implications of sensemaking in regard to implementing business strategy. The study concluded that diverging interests among workers shaped the sensemaking and thus the implementation of the business strategy.

Institutional factors also shape the sensemaking of individuals in the workplace. According to Coburn (2001), sensemaking "is collective in the sense that it is rooted in social interaction and negotiation" (p. 147). Organizational hierarchy shapes the sensemaking of



workers through sensegiving by a higher-level authority figure and determines how lower status workers make sense of their learning environment. According to Gioia & Chittipeddi (1991) and Maitlis & Lawrence (2007) sensegiving is a process by which individuals attempt to influence the sensemaking of others. In Gioia and Chittipeddi's study (1991), sensegiving by the organization's president shaped the sensemaking of university staff and stakeholders. The social context inside the workplace environment is another institutional factor that shapes sensemaking. Spillane et al. (2002) suggest that the environment and the actors in the environment influence and construct each other. In this study, teachers received the same policy message in different ways because teachers' beliefs about subject matter, teaching, students, and learning were influenced by the way they interpreted state and national standards. Spillane et al. also suggest that social and organizational structure, formal and informal interactions, and historical context shape sensemaking. Other researchers agree that institutional factors such as the experience of actions and behaviors of others, social contexts inside the workplace, workgroups, organizational values, professional culture, and patterns of interacting with colleagues all shape sensemaking (Coburn 2001, 2005; Spillane, Reiser, & Reimer, 2002; Stensaker et al., 2008).

### **Methodology**

My epistemological worldview is that of a constructivist. Constructivism derives from a philosophical position that we as human beings have no access to an objective reality (Merriam, 2009; Simon, 1995). Moreover, we construct our knowledge of our world from our experiences, which are shaped by our previous knowledge and social and environmental factors (Simon, 1995). According to Merriam (2009), there are multiple realities or interpretations of a single event. Thus, researchers do not find knowledge, they construct it. A theoretical framework was

also selected for this constructivist research as theory and practice are fundamentally intertwined in constructivist research (Mir & Watson, 2000).

Researchers who have a constructivist worldview usually conduct research with the purpose of describing, understanding, and/or interpreting an area by using qualitative methods to study a population or subject of interest (Creswell & Creswell, 2017). Additionally, qualitative methods such as interviews, observations, and document reviews are predominant in this constructivist research paradigm as supported by Mertens (2014): “The assumption about social construction of reality is that research can be conducted only through interaction between and among investigator and respondent” (p. 19).

Merriam’s (2009) *Qualitative Research: A Guide to Design and Implementation* was used to guide the methods of the study because of her epistemic commitments to constructivism. This study followed her research design for this qualitative study of the ways WBL mentors in NCTAP made sense of their world and their experiences.

### **Qualitative Research Design**

The primary interest of qualitative research is to understand the meaning or knowledge constructed by people. The researcher brings a construction of reality to the research situation, which interacts with other people’s constructions or interpretations of the phenomenon being studied, and the final product is yet another interpretation by the researcher of others’ views filtered through their own (Merriam, 2009). Qualitative research is an ideal design for this study because it provided an in-depth understanding of the lived experiences of workplace mentors in apprenticeships. According to Denzin and Lincoln (2005), qualitative data is often focused on individuals’ lived experiences and allows the researcher to study and interpret those experiences.

Case study approaches allow for in-depth exploration of a phenomenon and on-going sensemaking, in this case, of mentors in their work with mentees.

### **Selecting Case Study**

According to Merriam, a case study is “an intensive, holistic description and analysis of a bounded phenomenon such as a program, an institution, a person, a process, or a social unit” (Merriam, 2009, p. x). Focusing on a single case allows for depth of observation necessary to capture subtle and iterative processes by which WBL mentors experience the sensemaking process (Coburn, 2001). Three distinct characteristics of a case study design are particularistic, descriptive, and heuristic. Merriam (2009) defines case studies as particularistic because they “focus on a situation, event, program or phenomenon. The focus makes it an especially good design for practical problems or occurrences arising from everyday practice” (p. 43). Merriam (2009) defines case studies as descriptive because they result in “rich, thick, description of the phenomenon under study” (p. 43). Merriam (2009) also defines case studies as heuristic because the study can “bring about the discovery of new meaning and previously unknown relationships and variables can be expected to emerge from the results of the case studies” (p. 44).

I relied on in-depth interviewing, field notes, and document review. Ultimately, case study was appropriate because the purpose of the research required holistic, in-depth, investigation of a phenomenon and intended to allow for transferability of findings based on contextual applicability (Pickard, 2007). This study looked at six sites and was considered a multisite case study. Multiple sites were used to increase variability and to make interpretations more compelling.

## **Unit of Analysis and Context**

In the apprenticeship program being studied, the unit of analysis was workplace mentors who were involved in implementing WBL in advanced manufacturing apprenticeships housed under the North Carolina Triangle Apprenticeship Program (NCTAP). The stakeholders were selected from NCTAP, which is an apprenticeship program designed to develop experts needed in the modern advanced manufacturing workforce. This program is based in the North Carolina Triangle (Raleigh, Durham, Chapel Hill) area and focuses on developing technical, methodological, and social skills. The core training program utilizes a hands-on approach to develop skills across a wide range of disciplines. Starting in the 11<sup>th</sup> grade of high school, students enter a 4-year program that is divided into modules with classes leading to an Associate Degree in Mechanical Engineering Technology in addition to paid, on-the-job training at participating employers in the area. NCTAP combines on-the-job training and related classroom instruction to prepare workers for highly skilled and specialized occupations.

## **Case and Participant Selection**

NCTAP sites were chosen because of the number (11) of advanced manufacturing apprenticeships providing a large pool of participants to choose from. All the participants met the criteria of being a WBL mentor and working in an advanced manufacturing apprenticeship. A total of seven WBL mentors were selected for this study which is an appropriate number of subjects for this qualitative study.

Initially, the Director of NCTAP was contacted and asked to recommend WBL mentors who were currently working with apprentices in their respective companies. The requirements for inclusion included: currently working with apprentices, working within a company in the advanced manufacturing industry, and widely considered an effective and high performing

mentor. Though there were no objective protocols to determine *effective* and *high performing*, the director referred WBL mentors that he felt fit the inclusion criteria. There was also an assumption that the mentors who were in their role for more than five years were effective and high performing. Being an effective and high performing mentor was important because the themes that would emerge from data collection would help gain a deeper understanding of effective mentoring strategies and help researchers understand what shapes their ability to implement effective mentoring. The results would have implications for mentoring training and development.

Participants were selected using snowball sampling, a procedure most often used to collect data from populations difficult to reach; this method is arguably the most widely employed way to obtain samples in qualitative research in the social sciences (Noy, 2008). Snowball sampling involves initially locating a few key participants who meet the selection criteria who then refer the researcher to other participants who meet the selection criteria (Faugier & Sargeant; Merriam, 2009; Noy, 2008). According to Patton (2002), “The snowball gets bigger and bigger as you accumulate new information-rich cases” (p. 237). The study also sought to ensure maximum variation by seeking WBL mentors from diverse workplaces and years of experiences in the role. Unfortunately, there was not much variation in race and gender as all the mentors were White males. This was reflective of the population of WBL mentors in NCTAP as an overwhelming majority of them are White males.

Table 2.3.

*Participants*

Name (Pseudonyms)*	Gender	Race/Ethnicity	Company Description	Highest Level of Education Attained	How Long Have You Mentored Apprentices	Role Description
John Smith	Male	White	manufactures industrial systems for drying, roasting and toasting food products such as French fries and breakfast cereals	AS degree	5	Mentor in Workplace
Jack Johnson	Male	White	manufacturer of commercial kitchen ventilation systems	High School Diploma	5	Mentor in Workplace
Michael Scott	Male	White	supplier of gripping systems and clamping technology for a variety of industries and applications.	High School Diploma	5	Mentor in Workplace
Corvette Stewart	Male	White	partner education institution	Undergraduate Degree	6	Mentor in classroom setting.
Bill Education	Male	White	suppliers of vacuum technology in automation, handling and clamping applications.	Undergraduate Degree	17	Mentor in Workplace
Joe Smoke	Male	White	makes color cosmetics, hair color, beauty tools, fragrances, skincare, antiperspirant/deodorants and other beauty care products	High School Diploma	30+	Mentor in Workplace
James Mason	Male	White	manufactures industrial systems for drying, roasting and toasting food products such as French fries and breakfast cereals	High School Diploma	5	Mentor in Workplace

## Data Collection

According to Yazan (2015), case study methodology should rely on multiple sources of evidence, with data converging in a triangulating manner, which then benefits from prior development of theoretical propositions to guide data analysis and collection. Three methods of data collection that met research goals and assisted in bringing richness and validity to the research included interviews, document review, and field notes. An interview protocol (Appendix D) and document collection protocol (Appendix E) were utilized in this study.

Semi-structured interviews were conducted virtually via Zoom, were audio-recorded, and lasted approximately 60 minutes. Questions were designed to provide opportunities for follow-up questions and participants to elaborate on their answers, thus providing *thick* and *rich* sources of data. Sensemaking is triggered by chaos, and in this context, the chaos is defined as the ambiguity of mentoring in the workplace. Therefore, interviews were focused on the WBL mentors' sensemaking process related to their roles and responsibilities.

Document review is another main form of data collection that was utilized in this study. According to Stake and Yin, "Document review is particularly applicable to qualitative case studies—intensive studies producing rich descriptions of a single phenomenon, event, organization, or program" (cited in Bowen, 2009, p. 29). Documents that were reviewed included brochures, memos, digital newspaper articles, and social media pages. The review of these documents provided a more in-depth understanding of WBL mentors' experiences and allowed me to answer the two major research questions about how they perceive their role and the elements they perceive as important. After mentors were interviewed, they were asked to send over documents that provided evidence of their roles and responsibilities. Mentors sent over brochures and email memos. After the documents were received, Appendix E was used to

prepare the data for analysis. The content of the documents was summarized, the origin of the document was noted, and the significance of the document was noted. Digital newspaper articles and social media accounts were identified by surfing the internet.

Field notes were another source of data collection. Field notes are defined as “detailed, non-judgmental, concrete descriptions of what has been observed” (Marshall & Rossman, 2014, p. 139). Field notes have always had a significant role in quantitative data collection and analysis by providing a thick description in which a researcher not only describes behavior, but also records information about the context and how the researcher perceives people make meaning of their social worlds during interviews (Geertz, 1973). Furthermore, field notes are authored representations of ongoing social life (Emerson et al., 2011). Notes taken in the field serve to remind researchers of significant actions or possible connections to larger themes and allows researchers to integrate their own reactions and perceptions (Emerson et al., 1995; Saldana, 2015). In this study, field notes were taken during and after in-depth interviews. After the first few semi-structured interviews were coded, field notes were used as a reference to help make connections to larger themes already discovered and used as a source to record reactions and immediate interpretations.

### **Data Analysis**

According to Yin (2003), data analysis consists of examining, categorizing, tabulating, testing, or otherwise recombining forms of data to address the research goals (Yazan, 2015). Leech and Onwuegbuzie (2007) explain that data analysis is a systematic search for meaning. Thus, it was important that this study developed well-defined and well-structured data analysis methods to find meaning in the data that was collected. Before the data analysis process started, the collected data was prepared and organized for analysis. To prepare the data for analysis, I



transcribed the interviews. While listening, I aligned the theoretical assumptions of sensemaking with the research design and methods, ensuring the validity of the data.

To analyze the transcribed semi-structured in-depth interviews, I used the computer assisted qualitative data analysis software, ATLAS-ti. I entered each transcript into the program and created codes. After the data had been entered, they were analyzed in three phases: data reduction, data recognition, and data representation (Johnson & Christensen, 2000; Roulston, 2014). Data reduction involved first cycle coding where I did a close reading of the text and broke the data into smaller, more meaningful chunks. I used holistic first cycle coding where I applied codes to large chunks of text (Miles, Huberman, & Saldana, 2015). Strauss and Corbin (1998) would identify this phase as open coding, having defined open coding as an analytic process in which concepts related to the theoretical framework are extracted from the data. Sensemaking theory guided the choice of codes I looked for and themes I decided to associate with the codes. I began to code the answers to questions 3-7 on the interview guide and the actions of the WBL mentor throughout the interview. The actions of the WBL mentors were a result of the sensemaking process and thus were coded to uncover how they interpreted their roles and responsibilities.

Data recognition involved second cycle coding where I combined the codes into pattern codes (Miles, Huberman, & Saldana, 2014) which included categories/themes, causes/explanations, relationships among people, and theoretical constructs (Johnson & Christensen, 2000). Strauss and Corbin (1998) would identify this phase as axial coding, suggesting it is a process that aggregates data that was categorized during open coding. I was able to utilize techniques such as jotting as I went through the coding process. The last step was

data representation where I reported the findings in a written form. Final codes can be viewed in Appendix G.

Bowen (2009) defines document analysis as a “systematic procedure for reviewing or evaluating documents—both printed and electronic material” (p. 27). Document analysis supplemented semi-structured in-depth interviews and the codes developed from the interviews were applied to the document analysis procedures. Therefore, there were predefined codes when analyzing relevant documents. Bowen (2009) explains “the codes used in interview transcripts, for example, may be applied to the content of documents” (p. 32).

### **Validity, Reliability, and Ethical Considerations**

To ensure the highest quality of research, steps were taken to ensure high internal validity, reliability, and external validity. Member checks, and disclosure of research bias were incorporated to ensure high internal validity of the study. Member checks were conducted via google drive in which the participants were sent a folder with transcripts of the interview and initial research notes to review. Incorporating a positionality statement and creating an audit trail were other ways to ensure high reliability of the study. The use of thick description, multi-site design, the use of a specific category of apprenticeships (registered apprenticeships) were utilized to ensure high external validity.

According to Merriam (2009), the validity and reliability of a study depend on the ethics of the investigator. Thus, ethics must be considered throughout the entire data gathering, analyzing, and reporting process. Merriam’s (2009) perspective on ethical consideration guided the ethical approach of this study to ensure “the protection of subjects from harm, the right to privacy, the notion of informed consent, and the issue of deception ...to be considered ahead of time” (p. 230). This study received Institutional Review Board approval to ensure these

conditions were met. For document analyses, all documents were either public records or information gathered from participants and protected as part of their confidentiality.

### **Role as a Researcher**

I began my career in education as a middle school math and science teacher and received a Master's in Curriculum and Instruction. My investment in this topic stems from being in debt after leaving college and not having marketable skills immediately leaving undergraduate school. Apprenticeship programs are cost-effective alternatives for students to gain specialized and employable skills, obtain a postsecondary degree, and enter the workforce without debt. There are even opportunities to attain a 4-year degree after completing the program. Also, as a millennial, for me, traditional classroom instruction strategies are becoming increasingly ineffective. Thus, the primary educational strategy used in apprenticeship training, work-based learning, is also an alternative educational strategy that can be used to engage students and provide real-life applications to supplement classroom instruction. My intentions for this study were to explore the experiences of WBL mentors in apprenticeships and be able to provide recommendations to improve the implementation of WBL in apprenticeships.

### **Limitations/Delimitations**

There were several limitations to my study, both related to design and implementation. The design was limited to apprenticeships in NCTAP, which only houses apprenticeships in the advanced manufacturing industry. This also limits the generalizability because apprenticeships in different industries will have unique experiences different than the WBL mentors in the advanced manufacturing industry. There were also limitations related to the implementation of the study which included data collection. Interviews, field notes and document reviews were conducted over a three-month period. This limited the amount of data that was collected and may

have affected the richness of the data. There are several types of registered apprenticeship programs which use a variety of methods. However, this study was limited to the traditional 4-year hybrid model that combined on-the-job training with related instruction and utilized time-based assessments. WBL mentors in 2-year programs, where the process is accelerated, have different experiences and thus different perspectives on their roles and responsibilities.

Lastly, this study was bound to North Carolina apprenticeships and cannot necessarily be generalized to apprenticeships in other states with different expectations regulating the apprenticeships. This represents both an advantage and disadvantage of this study in that it explored mentors' sensemaking of their roles and actions in terms of one model, namely the NCTAP model. From the perspective of control of contexts, all participants were involved in the same type of program was a strength of this study.

The data sources for this study were also limited to in-depth semi-structured interviews, field notes and document reviews. Initially, the study included observations, but WBL mentors were reluctant to allow observations as they viewed them as intrusive and were skeptical about being judged on how they were implementing WBL. Another limitation of the study was the lack of diversity of the WBL mentors; all the WBL mentors self-identified as White males.

### **Findings**

Though there is no agreement regarding the roles and responsibilities of a WBL mentor, the WBL mentors in this study ultimately perceived their role as developing industry skills and preparing apprentices for long-term employment with their respective companies. Individually, the WBL mentors had unique interpretations of the role, but when analyzed as a collective case study, the WBL mentors interpreted or made sense of their role as being responsible for skill development, guidance, creating a sense of community, managing performance, and retaining

apprentices. The study also suggested that sociocultural factors shaped the sensemaking of the WBL mentors in the form of individual and institutional factors as identified in research. These overarching findings are summarized in Figure 2.3 below and explored more deeply in the following discussion. Individual summaries of the participants are presented in Appendix 1 to provide a deeper understanding of their contexts.

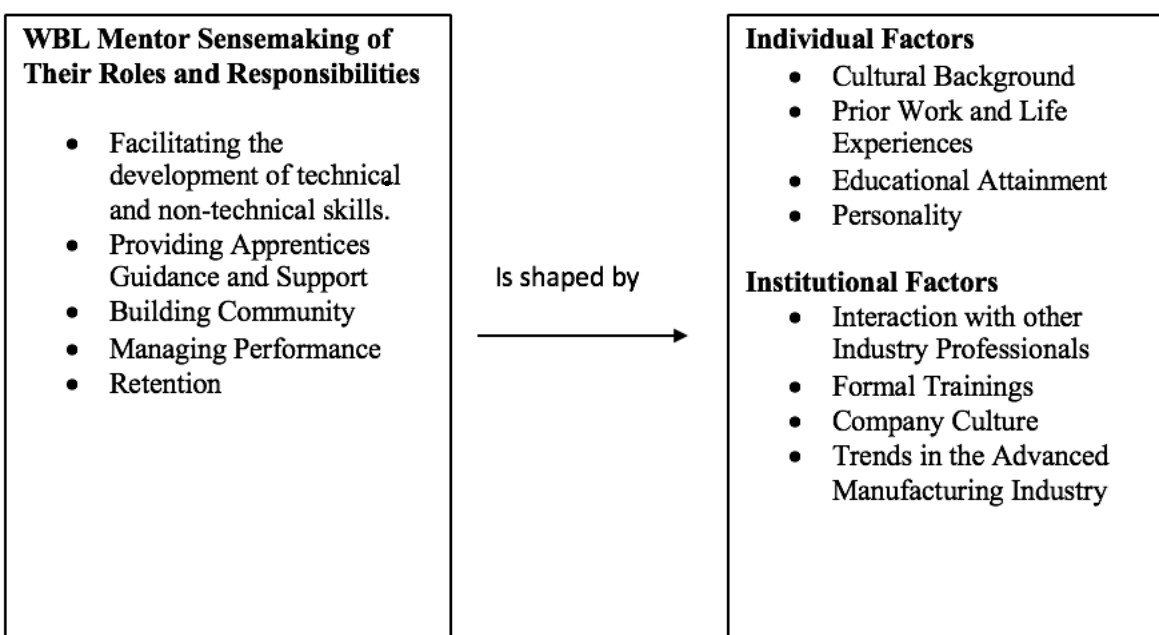


Figure 2.3. *Individual and Institutional Factors That Shape WBL Mentors' Sensemaking of Their Roles and Responsibilities*

### **WBL Mentors' Interpretations of Their Roles and Responsibilities**

There exists no agreement of the roles and responsibilities of WBL mentors in NCTAP and thus it was important to describe how WBL mentors made sense of an ambiguous experience. Though there were no formal agreements regarding the WBL mentor role, there were recurring themes that existed when a collective analysis was conducted of all the WBL mentors. Roles and responsibilities that were identified frequently during the study were as follows:

facilitating the development of technical and non-technical skills; providing apprentices guidance and support, building community, managing performance, and retention.

**Facilitating the development of technical and non-technical skills.** The WBL mentors perceived one of their main responsibilities as preparing apprentices to be productive workers within their respective companies by cultivating the necessary non-technical and technical skills. For apprentices to be productive within the workplace, they needed to be able to produce quality work and have effective communication skills, come to work on time, and work well with team members in the facility. The WBL mentors described one category of skills that apprentices needed to be considered employable; those skills were called employability or non-technical skills.

Theoretically, non-technical skills “include basic skills such as oral communication, reading, writing and arithmetic, higher order skills such as learning skills and strategies, problem solving, decision making, and affective skills and traits such as dependability and responsibility, a positive attitude, interpersonal skills (teamwork), self-discipline and self-management and ability to work without supervision” (Cassidy, 2006; Cotton, 2001). The mentors expressed the need for apprentices to have skills such as critical thinking, adhering to due dates, being on-time for engagements, being reliable, acting professionally during formal meetings, and utilizing effective communication skills. John, a workplace mentor at an advanced manufacturing company that manufactures industrial systems for processing food, suggests:

I could definitely do better with cultivating...employability skills, especially because it plays into the category with being on time and being reliable. I think those skills are needed to be employed. We also work with them on how to handle themselves in professional settings such as in meetings held in conference room settings or in office

settings. . . I'm a big believer in communication. So I do take my apprentices around to public speaking events. I'm a firm believer you can be the smartest person in the world or you can have the best skills in the world, but if you can't communicate those skills, you're not going to be that employable.

Corvette Smith is a classroom instructor who works for one of the local partner community colleges in which the apprentices receive a 2-year associate's degree. Smith teaches welding but insists that his students, who are also apprentices in NCTAP, acquire other skills: "A work ethic is totally foreign to a lot of these students and they have no concept of a due date...that things have to be done on a certain schedule or time. So, I must stress to them to adhere to a schedule, though it can be very challenging for many of them."

Bill also understands his role to cultivate non-technical skills in his apprentices. Punctuality and reliability are two non-technical skills that Bill believed WBL mentors should cultivate in their apprentices. Bill tells apprentices that they have to be at work in a timely manner because others in the workplace are depending on them and, as a manager, he makes decisions based on whether apprentices show up to work. Bill also believes that it is the role of the WBL mentor to teach apprentices "how to interact with other people at work," including how to work with the opposite sex. Thus, he makes sure his apprentices complete harassment training to help them avoid misconduct in the workplace. For example, Bill ensures that his male apprentices are prepared to work with female apprentices and are aware of positive and acceptable interactions. Ultimately, Bill believes that WBL mentors should teach apprentices the non-technical skills that they will need in any workplace and wants them to "learn a lot about how to become an adult and function as an adult in the workplace."

Six of the WBL mentors work with apprentices in a workplace context, while Corvette works with apprentices in a classroom setting. All the mentors perceive their role as helping apprentices develop technical skills specific to the advanced manufacturing industry. Technical skills are “subject-specific or content-specific knowledge and competence relevant to, or within, a particular discipline such as information technology or psychology” (Cassidy, 2006). In this case, technical skills refer to the skills required to be employed in the advanced manufacturing industry. All of the mentors perceived the development of technical skills as a critical element of their role. According to the PowerPoint on the NCAP website, employers are responsible for affording 6,400 hours of learning manufacturing skills and for ensuring that their apprentices obtain a journeyman certificate through the NC Community College System and USDOL. Michael explains that he develops apprentices’ technical skills through pedagogical techniques such as scaffolding. He starts off with foundational knowledge of the trade and does not directly move to a higher-level skill such as making production or customer calls until apprentices have developed the basic level skills. He believes that apprentices have much to learn when they arrive into the program; more specifically, they need time to develop higher level skills before assuming major responsibilities. Furthermore, Michael believes that in order to help develop these technical skills in apprentices, WBL mentors should have a level of expertise in the technical field and must have the ability to effectively communicate those skills to convey both the tacit and explicit knowledge needed for the apprentice to gain a comprehensive understanding of the technical skill or task.

Similar to other WBL mentors in the study, Michael Scott admits that he does not have expertise in all of the skills apprentices can learn, and thus allows apprentices to rotate throughout the facility to interact with different experts to develop new skills: “So what we do



with all the apprentices here is start them out with the basics of that trade... they're not...jumping right into making productional custom parts...they're working on little projects that have tasks or involve skills that are later being used in that profession when they're graduating." Jack Johnson agrees, saying, "We have to fine tune their skills when they get here. Most of them are not prepared for production type welding. What they can produce in an hour, I need to do 10x per hour. We really have to self-teach here." Corvette Smith gives an overview of the skills he helps apprentices develop: "So, they're going through the two-year mechanical engineering program. And during that they learn, basic statics dynamics, they learn some of the science courses, basic engineering courses, but also drafting and design. I basically teach drafting, design, industrial processes, materials, and industrial safety." John Smith explains, "I do teach them the stuff I have strengths in, which is... welding...I teach them how to get forklift certified. I teach them about hand tools and safety, mainly."

Developing apprentices' technical skills is a role that Bill believes he should assume as a WBL mentor. To help apprentices develop technical skills, Bill rotates apprentices to other areas of the building to gain different skills. He mentions that apprentices "may spend six months in finance...six months in customer service...if you want to be a mechanical engineer, we move you into an engineering group and set you with Solid Work guys."

The study also found that WBL mentors perceived their role of not only helping develop the technical skills that the workforce demands currently, but also technical skills that will be needed in the near future. Michael mentions that it is important to develop emerging technology-based technical skills that will prepare apprentices for future success. This shows that WBL mentors are monitoring technological advances in the advanced manufacturing industry and are ensuring that apprentices are acquiring the future-proof skills needed to be successful. A review

of the official NCTAP website suggests that apprenticeship programs within NCTAP are preparing apprentices for both current and future career paths such as electro-mechanical technicians, electromechanical engineering technologists, industry machinery mechanics, mechanical drafters, mechanical engineering technicians, mechanical engineering technologists, industrial engineering technologists, and inspectors, testers, sorters, and samplers.

**Providing apprentices guidance and support.** All the WBL mentors interpreted their role as providing apprentices the guidance they needed to be successful in life, the workplace, and the classroom. Participants explained how apprentices entering the apprenticeships were young and unfamiliar with not only having a job, but also living as a young adult. Thus, it was important to give them guidance about life in general, outside of professional learning environments. Bill also perceived his role as a provider of guidance and support to his apprentices beyond developing technical and non-technical skills. Bill mentions that a lot of apprentices that he worked with were younger, and explains, “So it’s important to have a mentor that they can relate to that can come alongside them and walk through them with personal life issues just as well as work issues.” Bill had an apprentice who wrecked his car and received several citations for the wreck. Bill had to give the apprentice guidance about how to battle adversity and Bill framed the experience as “not a life ending thing.” Furthermore, Bill’s understanding of guidance is focused on the apprentice moving forward from a bad experience having learned a lesson as a result. Several other WBL mentors suggest that it was important for their role to include helping apprentices manage their personal finances because it is one of the major skills needed as an adult. Jack Johnson explains, “One of the things that I try to work with, even some of our students that come through the NCTAP program, is talking about financial stability and not accumulating a ton of debt upfront in their life to contend with.” John Smith

also provides personal support, saying, “I don’t dig in their business, but you know, to make sure they are doing okay at home. My program being youth, I try to help them with...guidance financially. Cause’ this is the first time a lot of these young adults are actually making a paycheck and earning money.”

Guidance in the workplace was another responsibility highlighted by the WBL mentors. WBL mentors recognized that apprentices were new to the workplace and that they must set a vision and goal for themselves to ensure long-term success not only in the apprenticeship program, but also in the industry. Furthermore, the apprentice must have both tacit and explicit knowledge in order to be successful in their respective workplaces, and WBL mentors perceived their role as having to transfer that knowledge through guidance. Jack Johnson describes how he guides his apprentices: “I spend time talking about things in the workplace...their goals and visions...students need the guidance as novices in the field...teaching them and guiding them along the way...we are gearing them to work in the manufacturing environment.” Michael Scott likes to “supply guidance...they must be able to convey knowledge to the apprentice so that the apprentice gets the expertise in the field.” Corvette Steward believes his role is to “prepare them to know that they need to know in industry, industry standards, customer perspective, client erspective.”

Guidance was also highlighted as a way for WBL mentors to ensure apprentices’ success in related instruction, which occurred at the local community college. Corvette was a classroom instructor who had a primary role of preparing apprentices for classroom success. To ensure that apprentices are successful in the classroom, Corvette offers opportunities for apprentices to get personalized and targeted guidance. Corvette explained that he sends “emails and requests that they meet us one-on-one.” Corvette also does tutoring sessions once a week and provides office

hours before and after class. Though Michael Scott's focus is providing guidance related to workplace learning, he provides opportunities for apprentices to get guidance about schoolwork, from himself and other members of the team. Guidance related to schoolwork extends beyond assisting with content; it also includes providing strategies for studying, how to take notes in class, and when to ask clarifying questions. Michael admitted that he did not work much with the classroom instructors and suggested that WBL mentors should think about their role expanding to include meaningful connections with classroom instructors related to the content that they were teaching and discussions about how that content aligned with specific WBL activities in the workplace.

**Building community.** In order to build community, the majority of WBL mentors in the study afforded a community of practice for apprentices to work and learn together and developed positive interpersonal relationships with their apprentices. Michael created a community of practice with his apprentices by allowing the apprentices to engage with other experts within the work area to help teach skills that he does not have expertise in. Michael explains, "I don't know everything by any means with what we do here. So I can still rely on other people that are experts in different fields to then take over...that kind of... mentor role...and teaching the apprentice in that field." Even for the apprentices who struggle with both technical and academic issues, Michael ensures that his apprentices have study groups with staff members who are experts in their field. Michael even explains that he builds community for apprentices by having a dedicated space for apprentices to gather and learn collaboratively. Michael suggests that building this type of community shapes both apprentices' sense of belonging and skill development. WBL is socially situated; thus, it is important for others to be involved in the learning process.

According to John, he is the main contact for the apprentices; however, his role is to put them in contact with other staff who can teach him specific tasks. John explains that he wants his apprentices to interact with other apprentices inside and outside the organization. Ultimately, John believes that “it takes everyone in the company to make it happen.” Furthermore, John and Jack both believe that apprentices should rotate throughout the company and practice skills with a variety of staff members. Jack explains: “We try to give them exposure to all parts of the facility.” He perceives his role as the person to facilitate apprentices going through the entire facility and introducing them to different skills with the appropriate personnel. Jack interprets his role as having to assign apprentice personnel for specific tasks and each personnel works with the apprentice to develop different tasks. Jack believes that providing this type of experience for apprentices is an advantage for the company, especially when a team member may be absent; an apprentice who has rotated around the facility would be able to fill that job for a day or two.

All of the participants interpret their role as needing to build positive interpersonal relationships with apprentices. Michael suggested that it is important for him to “relate and connect” with his apprentices through effective communication. Jack elaborates on the way he interprets mentorship and believes that:

You have to have the [apprentices] buy-in and you have to build some type of relationship with that person. I’ve got for the most part about 140 employees...for I would say 110 of those employees, I can tell you something about them, about their family, something that I can socially interact with them. I think that it’s very important to know what their likes, what their interests are, and to communicate that with them from time to time.

Corvette also believes it is important for his apprentices to share their personal experiences inside and outside of the workplace; he subsequently connects classroom learning to those experiences. John introduces the duality that exists with workplace mentors and interprets his role as having to be both a mentor and a supervisor. While John is able to be a compassionate and understanding mentor who builds strong relationships with his apprentices and creates a fun environment for the apprentice, he also perceives his role as a supervisor that has to correct apprentices' mistakes (i.e., being late or failing grades). John believes that the mentor has to make sure that apprentices' personal life is stable because "if they are not successful at home, they will not be good at work."

**Managing the performance of apprentices.** All the mentors perceive one of their main responsibilities as performance management, whether they are tracking performance in the workplace or in the classroom. Jack elaborates on his interpretation of his role related to performance management:

No matter where the guys were in their performance aspect, they were meeting every expectation that was ever set for them...We're communicating what is expected and we're giving you feedback based upon that inspection. The one thing I brought to the company here, we've got seven plants and they had ever used personal development plans. Just to set some SMART goals, specific, measurable, achievable, realistic and timely. . . .If I have a guy struggling out on the floor, coming into a new position, there's a couple of things I want to find out. Is it their lack of wanting to do the job? Or is it their ability to understand what it means to do the job?...We'll use a performance improvement plan to go back out, and see what's causing them not to be able to hit their goals throughout the day.

From John's interview, it is evident that performance is also shaped by the type of apprenticeship program the company participates in. John's company assesses apprentices using a time-based approach where apprentices are evaluated based on the number of hours they put in the workplace. In NCTAP, apprentices are required to complete 6,400 hours of learning manufacturing skills in the workplace and 1,600 hours of college education at the local community college. John interprets his role as having to track the apprentices' hours throughout the program. Corvette also tracks apprentices' performance, but he does so in the classroom during related instruction. Corvette tracks their performance through a grading system and using rubrics that are aligned to industry standards and the academic standards of the community college. Bill believes that performance management includes assessing apprentices' performance in both the classroom and the workplace and subsequently developing interventions that play to the apprentices' strengths and "help them on their weaknesses."

Another aspect of performance management that was extracted from the data was the use of feedback. The mentors believed that the use of feedback to help the apprentices grow was a major aspect of their work. In the classroom, Corvette believes it is his role to give "feedback to improve apprentice learning." Jack discussed how he works with his apprentices to set clear expectations and gives feedback based off those expectations. He believes that feedback is not as effective unless you have communicated as a mentor or supervisor what your expectations were. Bill perceives an element of his role as being a manager of apprentice performance; therefore, he talks about having quarterly sit down sessions with apprentices to get their feedback to make sure they are meeting their needs and to also give them an evaluation of their progress. He also mentions that daily interactions sometimes serve as informal feedback mechanisms. John believes that "no matter what the situation is I'm there to help them one way or another. Whether

it be giving them positive feedback and motivation...I'm there trying to help them also by correcting them and teaching them the proper way." Jack explains, "I'm a mentor and a mentor is there to help them grow in every aspect that I can help them grow and be successful."

**Retention.** Three of the workplace mentors believed that, ultimately, their role is to retain apprentices as employees within their respective companies; the classroom mentor felt his role was to prepare and retain the students in the manufacturing industry. Even the NCTAP website explains that the overall NCTAP experience was "designed to develop experts needed in the modern workforce." A PowerPoint presentation available on the NCTAP website shows that the manufacturing companies in NCTAP are "investing over \$150,000 in apprentices." WBL mentors are employees of these companies and are aware of the major investment the company is making in apprenticeships. Therefore, they interpret their role as protecting the company's investment by not only helping the apprentice prepare for industry but also by retaining them within the company. In an interview with a local magazine (Davis, 2018), John bragged about only losing three apprentices in the four years he had been mentoring. In that interview, John knew each of the reasons why the three apprentices left:

I've actually lost only three in the four years I've done this. One wanted to pursue a music career with her parents' support, so what could I say at that point? I had another one that changed his major to business because he wanted to eventually work in his parents' company, but that major didn't fit into the parameters of the associate degree that we have set up. That particular young man actually moved into an interim position, basically. The third one I lost because he wanted to learn more about automation.



When WBL mentors were asked to elaborate on a success criterion for their role, all the WBL mentors believe that others in their role should be judged off of their ability to retain their apprentices within that company. Michael, John, and Bill agree, as Michael explain in detail:

I definitely think retention. It would be a big part and the apprentices staying with the company after they graduate from the apprenticeship...the apprentices can say hey, yes, this is something good...this is something I want to be in...that the apprentice is wanting to say, hey, I want to finish this, I want to stay with this company. Retention absolutely is a big part.

John Smith explains the focus on company retention:

The mentors are very, very important right at the very beginning. Definitely we're setting the stage for the future. If you want them to be, you know, good long term employees, you know, with work-based learning, that mentor is really the biggest part. For the company to invest the money that they're investing in work-based learning or apprenticeship in our case, again at the end, you know, the company does want to see retention.

Bill Education explains how he tries to bring people into the industry:

My opinion is to be a really good mentor, to get these employees... I want to feel challenged. I want them to feel rewarded. I want them to fit, feel fulfilled, anxious to come to work, like what they are doing, like the people they are working with... It's a safe place and I can see myself here for the next 20 years.

### **Individual Factors Shaping WBL Mentors' Sensemaking of Roles and Responsibilities**

The myriad of ways WBL mentors differ are known as individual factors that shape how WBL mentors interpret their roles and responsibilities within their respective apprenticeship

programs. The individual factors identified in this study were cultural background, prior life and work experiences, educational attainment, and personality.

**Cultural background.** Cultural background, for the sake of the study, constitutes ethnic values and experiences that have shaped the upbringing of WBL mentors. For Michael, his cultural background played a critical role in the way he interpreted WBL mentorship. Michael reveals in the interview that he is originally from Germany and that he lived there until he was 20 years old. Furthermore, his perceptions of apprenticeships and the roles of those who work in them are shaped by what he saw in Germany. He explains that “in Germany, apprenticeships are very much part of the culture and a common way to enter the workforce.” Michael’s father and two brothers all had jobs in technical fields and matriculated through apprenticeships. Michael’s father was a mold-making technician, which was a hands-on job in the plastics industry. Stories from his father’s experiences helped him gain insight into the challenges related to WBL mentorship as well as the elements that worked well and were favorable for his father. Ultimately, this shaped his interpretations of the role and how he wanted to embody the role. Michael also enjoyed working with his hands and was introduced to multiple internships with a variety of companies while in Germany. This experience shaped his interpretation in a way where he wanted to embody the positive qualities of his WBL mentor and minimize the negative qualities, when he assumed the role in the United States.

Though Michael was the only participant that discussed his cultural background, he was the only participant that grew up in a country other than the United States. This is significant because Michael grew up exposed to a culture that emphasized WBL and apprenticeship programs, while the other participants grew up in the United States, a country that emphasizes 4-year colleges and universities. Perhaps other WBL mentors, who grew up in countries that

emphasized WBL and apprenticeships, would be heavily influenced by their cultural background.

**Prior work and life experiences.** Prior experience—both in work and life—was another factor that shaped the way WBL mentors interpret their roles and responsibilities in apprenticeships. While explaining his cultural background, Michael makes sense of his role as a workplace mentor by calling on his exposure to mentors in his own apprenticeship program. Michael added that participating in an apprenticeship program helped him be prepared to lead and mentor in one. Furthermore, Michael explains, “I gained knowledge and experience over the years and have passed it down to apprentices.”

Though Jack did not participate in an apprenticeship program, his work experience in a restaurant many years ago has been manifested in the way he interprets his role as a WBL mentor. Jack explains that his restaurant experience taught him how to think critically about the manual responsibilities he held (such as preparing salads), and, more importantly, how to save time by eliminating steps that were unnecessary. In his role as a mentor, Jack manages apprentices’ performance by helping them eliminate unnecessary steps and increase the production in their work.

Corvette, a WBL mentor in the classroom, has attributed the way he perceives his role to his previous experience in the manufacturing industry. Corvette worked for two years as a Designer Draftsman at Siemens after having previously worked in telecommunications. These experiences have shaped his idea of the mentor role, particularly his belief that classroom learning should incorporate personal experiences from the workplace so that the learning is relevant and applicable to the apprentice.

John's prior work experience started with welding and later involved being an outsource project management where he supervised quality of the work produced by others and was responsible for budget and time. These first-hand experiences allowed him to understand various elements of workplace mentorship. When asked what influenced his interpretation of his role as a WBL mentor, John explained it is "hard knocks" or real-life experience that has shaped his thinking and prepared him to be a successful WBL mentor. John also identifies a life experience that has shaped his thinking about this WBL mentorship role: he tells a story of how he gained custody of his two- and five-year-old children and raised them as a single father. He believes that experience helped him recognize and acknowledge the duality that exists with WBL mentor; he has to be both a loving and understanding mentor for apprentices while also managing their performance, including being "tough" when behaviors need to be changed.

Bill has a lot of real-life experiences that have shaped his understanding of the WBL mentor role. More specifically, he attributes the way he thinks about his role to a previous work experience where he was exposed to a strong management system in which apprentices were a key part. According to Bill, "I was able to watch and learn from other mentors on how to handle that." Bill also explains that his "home situation" shaped his interpretation of his WBL mentor role. His father was both warm and strict when he needed to be, and those are some of the qualities that manifested in Bill as he took on the WBL mentor role.

**Educational attainment.** Having had formal educational experiences beyond high school was a factor that was identified in the study as shaping the way WBL mentors perceived their role in apprenticeships. The three of the WBL mentors who received formal education beyond high school emphasized in their interviews that their roles included connecting workplace and classroom learning. This interpretation was shaped by their experience in either a

community college or 4-year college in which they saw the importance of their learning connecting to both the workplace and classroom. Corvette attained a computer engineering degree and went to a local community college to get a 2-year degree in mechanical drafting. John went to a community college directly after high school and received a 2-year plan management diploma. Both mentors attribute their educational attainment to their belief that mentors should ensure that learning in the classroom and the workplace are connected to one another, stressing the importance of classroom learning along with practical application.

**Personality.** The personality of a WBL mentor has a major influence on the way they think about their roles and responsibilities. One of the perceived roles of a WBL mentor is to retain apprentices in the company because of the major investment that they are making in the apprentices' training. Furthermore, WBL mentors in this study perceived it as important for them to have certain personality qualities that influence apprentices' wanting to stay with the company.

Michael mentions that his personality traits include being "open" and "compassionate" as they relate to his interactions with apprentices. When Michael refers being *open*, he means he is willing to listen to the needs and perspectives of others. These personality traits not only shape his thinking but also manifest in his actions as he listens to his apprentices' needs in order to provide a quality learning experience for them. Apprentices are young and from a different generation than their WBL mentors. In fact, the average age of apprentices in this study was 19, and the average age of the WBL mentors in this study was 46. There is almost a 30-year age difference; thus, the two groups bring entirely different perspectives on how to approach challenges or even learn new skills. If WBL mentors are not open to apprentices' perspectives, it

may shape an unfavorable experience for apprentices. Michael suggests that this understanding between the two groups can only happen with WBL mentors who are “open.”

Bill also mentions that he is “open” and “honest,” and he believes those personal characteristics shape his understanding of the WBL mentor role. These traits are important because apprentices are young adults who are in a transitional period of their lives and are trying to find purpose. If the mentor observes that the apprentices are not doing well or see that they may not be in the best position to succeed, then the WBL mentor should be open and honest with the apprentices about the reality of their performance. Bill explains that his “servant by nature” and “type B” personality shape the way he understands his role as a WBL mentor. Though not supported by research or science, in popular culture type B personalities are individuals who are relaxed, are flexible, and expressive as it relates to showing emotions. In contrast, type A personalities are those individuals who are competitive, emotionless, and only focused on accomplishing goals to achieve success. He perceives his role as a servant to the apprentices and as a source of support to ensure the apprentices’ success in life, the workplace, and school. His type B personality also shapes the way he looks at his role in being flexible and not fixed. Moreover, he believes that individuals with type A personalities have a hard time being a mentor because they are not flexible and do not meet apprentices where they are in their development journey. Bill explains:

My belief is people matter period and everybody has a job to do and everybody's equal. I don't care what your pay scale is and I don't care what it says on your badge, we're all in this together and every job is just as important as everyone's one. If you don't get your job done, then the whole team suffers. And I've always had that belief.

## **Programmatic and Institutional Factors Shaping WBL Mentors' Sensemaking of Roles and Responsibilities**

People's interpretation of the world around them is socially situated and heavily influenced by the context in which they live their daily lives. As for WBL mentors, there are both programmatic and institutional factors that shape their sensemaking. Their interpretations of their roles and responsibilities are influenced by factors related to their daily lives within their respective companies and the overarching institution of the advanced manufacturing industry. These institutional factors were highlighted throughout the study and include interacting with other professionals, formal trainings, company culture, and industry expectations.

**Interaction with other industry professionals.** The most compelling factor that emerged from this study was the influence of informal learning in the form of mentors' interacting with other industry professionals inside NCTAP. All the WBL mentors identified the lack of formal learning opportunities that exist for them and identified learning from other industry professionals as a major source of learning and a factor that influences their thinking related to their roles and responsibilities inside NCTAP. Michael's interview provided detailed insights into how his interaction with other industry professionals has shaped his thinking about his roles and responsibilities within his company, sharing that he attends formal conferences organized by the state to interact with other industry professionals. Michael interprets conferences as an opportunity to exchange ideas and learn from other professionals. More specifically, Michael learns how other industry professionals are addressing the generation gap and effective ways to work with the younger generation through his participation in NCTAP meetings. He also exchanges ideas related to how to effectively provide guidance about life to young adults without invading their privacy. Ultimately, NCTAP conferences not only provide

formal spaces for learning via workshops, but they also provide spaces for WBL mentors interact with each other and informally exchange ideas and learn from each other. Another influential interaction that shaped Michal's thinking about his role was his interactions with his current supervisor and mentor. Michael's ability to see his mentor's actions, to have conversations with him about decision-making, and be able to watch his management styles in action have all shaped his thinking related to his current role as a WBL mentor. Michael also admits that he has a "good" relationship with other mentors and communicates consistently with them. He explains that they have open conversations at least once a week about the challenges they are experiencing and the different ways they address those challenges. Michael suggests that open and honest dialogue leads to new thinking about their roles and responsibilities, specifically how they address challenges with apprentices.

Jack's interview also highlights that a major influence on his interpretation of the roles and responsibilities of a workplace mentor is interactions with other workplace mentors while in his current role. Jack travels to conferences where he is able to exchange ideas with work-based learning mentors of all sorts and agrees that listening to others helps him think about his role currently. He also has open conversations with other mentors who are under the NCTAP umbrella on a regular basis, typically once a week, and he uses that time to exchange ideas. Jack elaborates on something he was told almost 30 years before that characterizes how he interprets any of his responsibilities in life: "I don't remember who taught me this but someone taught me to look at successful people and mimic what the positive things they do." Jack's mentor, who has mentored him for six to seven years at his current job, has heavily influenced his understanding of his role as a mentor. He watches him and even asks him for advice. Lastly, Jack considers the



apprentices his peers, and his interpretation of his role is heavily influenced by the feedback he receives from his apprentices.

As a classroom mentor, Corvette communicates with other professors often which influences his understanding of his role. He explains that he has a couple of formal meetings with other professors at the beginning and end of the semester and informal conversations with them daily. He explains that he and the other professors “compare notes” and compare student performance and behavior. These interactions help him understand that as a classroom mentor, he must track student performance in other classrooms and track what is being taught in other classrooms so that the instructional material in his classroom is relevant, engaging, and continually builds off previous work.

The social interactions that have shaped John’s understanding of his role were highlighted in the interview, specifically when he told the story of how his apprentices have a major influence on the way he thinks about mentoring. John gained a deeper understanding of his role by traveling to Switzerland and learning from their work-based learning professionals. He explains that Swiss apprentices have classrooms inside the companies and even have designated production areas for apprentices. These experiences have further shaped his understanding of his role and the need to emphasize classroom learning while creating communities of practice for apprentices. Lastly, John’s interactions with those on a community board for apprenticeship professionals has greatly shaped his interpretation of his role. He explained that he spoke on a board and had a mentor meeting with over ten NCTAP companies and talked about everything from problems to successes and admits that they all learned a lot from each other.

**Formal trainings.** Formal professional development workshops have been another institutional factor that has shaped the mentors’ understanding of their role. Professional

development can be categorized as formal training for mentors, though all of the mentors admit that formal training related to be a workplace mentor is scant and hard to find. Michael talked about how he receives formal training both from his company and from external sources. Jack revealed that he has participated in several formal professional development training that have shaped his understanding of his role. One that was at the forefront of his memory was a training entitled “From Bud to Boss” and trained him as a manager on how to manage the unique personalities of subordinates. Though, it wasn’t specifically pertaining to mentorship in the workplace, it shaped the way he looked at mentoring as both being both a mentor and a manager and how to deal with the varying personalities of apprentices. He also participated in a training last year on how to deal with difficult employees and improve his managerial skills. Again, this training was not specifically about mentoring, but he saw parallels that were applicable in his role as a mentor in the workplace. Other WBL mentors’ interpretations have also been shaped by formal professional development experiences.

Corvette, John, and Michael all talked about formal professional development opportunities that have shaped their thinking about the role. Corvette discussed professional development that is offered at the local community college level and is specific to not only the way he views himself as an instructor, but also as a mentor. The professional development sessions that occur a few times during the semester are focused on students with special needs, diversity and inclusiveness, and learning how to meet the needs of students who are also in apprenticeships. John has also participated in workshops training provided by the local community college; however, his learning experiences have been more aligned to his role as a workplace mentor such as sessions on youth development and how to be a passionate mentor for apprentices. John admits that these training sessions have shaped the way he looks at the

mentoring role and are the reason he views his role as not just developing skills in apprentices, but also as developing young adults who are starting their journey to adulthood. Some of Michael's formal professional development comes from his company that provides WBL curricular materials produced in Germany. Michael received additional professional development resources after asking his leadership team for assistance on delivering WBL with his apprentices. Michael added that the materials he received were being used in German apprenticeships, a country that focuses its efforts with ensuring quality WBL exists. Michael also attends formal training experiences in the local community that aren't necessarily related to WBL mentorship but are for more general leadership and interpersonal skills. More specifically, the content one training Michael attended incorporated situated learning focused on dealing with difficult employees and/or direct reports.

**Company culture.** According to the study, company culture is an influential factor in shaping the way WBL mentors think about their work. The companies in which the WBL mentors work have unique cultures that shape the way each of the WBL mentors in the study think about their roles and responsibilities. Michael's company is supportive of his role as a mentor and provides resources that align with the company's interpretation of his roles and responsibilities. For example, Michael requested new machines for his apprentices. His company granted his request and provided him and his apprentices with new machines because they viewed his role as preparing apprentices to be future employees with the company, which meant teaching apprentices the technical skills for operating new machines and technology. There were other requests that were denied because the requests did not align with the company's expectations of the mentoring role. The granting and denying of resources helped shaped Michael's idea of his role and shaped what he thought about his responsibilities as a WBL mentor.

Bill talked about how company culture has shaped the way he thinks about his role. He characterizes his company's culture as unique and transparent. Bill explains that his company shares its financial records and everyone in the company is a family to the point that everyone has "cried together and...prayed together." Bill also shares that his company is ranked among the top companies to work for in their headquarters in Europe. Thus, that culture translates to the workplaces in the United States, specifically the North Carolina location. According to Bill, "This is not a punch a timecard, show for work, do your job, and go home...it's not that kind of company." Furthermore, Bill is in a company that prioritizes apprenticeships and views them as important and meaningful. Because of this type of company culture, Bill views his apprentices as more than just the workers they need for a depleting workforce; he sees them as young adults to develop and build a long-term relationship with.

**Trends in the advanced manufacturing industry.** All the WBL mentors agreed that there were no organizational documents that shaped their idea of their roles and responsibilities. However, WBL mentors mentioned in some type of way that their role was to prepare apprentices for employment in the advanced manufacturing industry. Moreover, WBL mentors admitted to being aware of industry standards and expectations in order to prepare their apprentices for the emerging advancing manufacturing workforce. The community college partner suggests that technical standards for the Mechanical Engineering Technology program, where all of the WBL mentors' apprentices attend, include: having sufficient visual capacity to read prints, schematics, documents, charts, and information on computer monitors; being able to communicate with co-workers; and being able to wear hard hats, safety glasses, steel toe shoes, and other safety related equipment as required by industry. These are some of the industry

expectations that WBL mentors in NCTAP have internalized and now shape that way they interpret their role.

Due to technological advances in the industry, industry expectations continuously evolve. Thus, as new processes such as automation begin to play major roles in manufacturing companies, the way WBL mentors view their roles begins to change. Now, WBL mentors have to be continuous learners in addition to ensuring their apprentices are also continuous learners. Michael's interview highlights the need for WBL mentors to be flexible and open to changes and learn how to be adaptable to the evolving nature of the advanced manufacturing industry. He believes that he should be involved in continuous training and be able to bring in experts that are knowledgeable enough to train the apprentices in new technical skills.

### **Discussion**

The purpose of the research presented in this study was to describe the interpretations of WBL mentors about their roles and responsibilities as mentors, and to investigate the factors that shape those interpretations. This study was designed to address the following research questions:

1. How do WBL mentors interpret their roles and responsibilities in implementing WBL in an apprenticeship program?
2. Which individual and institutional factors shape WBL mentors' overall interpretation of their roles and responsibilities in implementing WBL in an apprenticeship program?

The research methodology used in this study revealed unique insights into how work-based learning mentors made sense of their roles as they told stories about past experiences and interactions with others that shaped those interpretations. Though the individual cases illuminate the complexities of the role and responsibilities of an individual WBL mentor, when considered

as a whole, it provides a deeper understanding of how socially situated and relational the role is, thus revealing that these mentors interpret their role in more similar ways than not.

The WBL mentors in this study each interpreted his role in a way that closely aligned with literature on WBL mentorship. Most importantly, each of the WBL mentors believed that their ability to provide effective mentorship and guidance was a major driving factor of the success of the apprentice, which aligns with previous literature on workplace mentorship, especially Cornford and Gunn's (1998) study with commercial cookery apprentices in South Wales' hospilities industry. The mentors also interpreted their role as needing to help apprentices develop employability skills which included higher order skills such as critical thinking. This aligns with the literature that workplace mentors should guide learning in a way that promotes higher-order thinking skills as the learners are doing and thinking (Carelson et al., 2003; Cassidy, 2006; Cotton 2001).

Carelson et al. (2003) also contend that the first step to engaging apprentices in the workplace is to help establish a sense of trust by listening and expressing positive expectations. In the study, mentors interpreted their role as building community through strengthening interpersonal relationships with apprentices by relating to them and communicating with them. Jack's interview highlighted these characteristics as he explained that he knew small, but important facts about 100 of his employees, including his apprentices, which meant he was a deep listener. He also talked about setting SMART goals with his apprentices, which helped them set positive expectations for themselves. Another WBL mentor, John, also made it clear that his role was to listen deeply and ensure that apprentices had positive experiences in the classroom and personal lives.

There is strong evidence from this study that the WBL mentors interpret their role as facilitators rather than as expert resources. In fact, the WBL mentors in the workplace all reveal that they taught apprentices the skills that they were experts in and rotate the apprentice throughout the facility to learn a variety of other skills from other team members. This is in direct alignment with literature that suggests skill development and learning occur when workplace mentors act as facilitators of suitable learning environments, as opposed to working in a more traditional role as discipline-bounded experts (Boud & Costley, 2007; Chisholm et al., 2009). The act of rotating apprentices throughout the facility also aligns with literature related to the implementation of situated learning. Situated learning can be described as allowing opportunities for apprentices to encounter, on a regular and recognized basis, new situations, problems and ‘events’ in and by which they can learn about new methods, technologies or products (Onstenk, 2017). Situated learning, as a supplemental instructional technique during WBL, leads to strong identity formation for learners as central parts of their learning a trade and becoming a member of a community of practice (Nielsen, 2008). The learning strategy also helps them develop soft skills such as the ability to work within a team to solve problems within the workplace (Vaughan, 2017).

Another direct connection to the literature that was illuminated in the study is that WBL mentors interpret their role as using effective pedagogical strategies to provide quality learning which includes using feedback mechanisms and scaffolding. Jack especially mentioned that his role was to scaffold and elevate the tasks and increase responsibility of the apprentices as they mature through the apprenticeship. Both Jack and Corvette explicitly talked about managing apprentices’ performance using feedback to help them grow continuously. Empirical studies from the literature support these findings and suggest that WBL mentors rely on instructional

techniques such as scaffolding and assess apprentice performance using targeted feedback (Evanciew & Rojewski, 1999; Morris, Blaney, & Swanwick, 2010).

A responsibility that is not necessarily found in the literature, but was highlighted in the study, was WBL mentors' belief that their success as mentors was based on their ability to retain their apprentices. Billett (2001, 2004, 2006) suggests that the mentor plays a crucial role in engagement and, inevitably, engagement plays a major role in predicting retention in apprenticeships. The WBL mentors in the study believe that they are not only responsible for the elements that shape engagement, as suggested by Billett, but are also responsible for all the factors that determine whether the apprentice will stay with the company. This role was not explicitly highlighted in the literature.

The purpose of the second research question was to investigate the factors which influenced the interpretations of the WBL mentors. The majority of the factors that were highlighted in the study aligned directly with the literature related to the factors shaping sensemaking. Study highlights that cultural background was a major factor in shaping the interpretations of the role by Michael, a WBL mentor from Germany. The literature explicitly states that an individual's background is a major influence in shaping sensemaking and, in this case, interpretation (Coburn, 2005; Stensaker et. al, 2008).

Another factor that that aligns between the study and the literature is the influence of prior work and life experience on the sensemaking process. The WBL mentors cited examples wherein their prior experience shaped their interpretation of their current work as a mentor. Michael's idea of the responsibilities of a WBL mentor was shaped by his experience as an apprentice in Germany; Jack's understanding of his role was shaped by his experience years ago working in a restaurant preparing salads; and John's experience as a welder and later as a



program manager helped shaped his idea of being a WBL mentor. This aligns with the literature that suggests that a deeper understanding how individuals make sense of the world can be shaped by their existing knowledge (Coburn, 2005; Spillane, Reiser, & Reimer, 2002; Stensaker et al., 2008). This is explicitly illuminated in Coburn's 2005 study with teachers and school leaders which revealed that teachers and school leaders draw on their existing working knowledge to interpret new instructional approaches.

All WBL mentors cited examples where they gained a deeper understanding of their role through watching and frequently talking to other professionals or peers in the workplace. This is in direct alignment with the sensemaking literature. According to Coburn (2001), sensemaking "is collective in the sense that it is rooted in social interaction and negotiation" (p. 147). Furthermore, literature suggests that patterns of interacting with colleagues and others inside the organization have a major influence on sensemaking (Coburn, 2001, 2005; Spillane, Reiser, & Reimer, 2002; Stensaker et al., 2008).

This study does highlight factors that are not necessarily found in the literature. In this study's findings, educational attainment, offsite and informal professional development were factors that influenced the sensemaking of the WBL mentors. Mentors who had formal education training from community colleges or universities saw their role more explicitly as someone who had to bridge the gap between theory and practice while working with mentees. Also, off-site training by the local community college helped shaped WBL mentors' ability to think expansively about their role. Though not stated explicitly in the study, the off-site training could have been influential also because, as previously discussed, WBL mentors learn not only from a facilitator, but also from their interactions with other WBL professionals. Lastly, several of the mentors cited popular books in current culture such as *How to Win Friends and Influence*

*People*, suggesting that there is a lack of explicit expectations for how a WBL mentor in apprenticeship programs within the NCTAP umbrella learns their role. It also shows that WBL mentors explored more development in self-directed learning, finding materials to gain a deeper understanding of their role.

Overall, there were several important insights to note that were not highlighted in the study. The first compelling insight was that WBL mentors did not see themselves as responsible for parent engagement. Apprentices are young adults, and some are even still living at home with their parents. Since WBL mentors believe they should provide guidance about life in general, and they do care about what goes on in the apprentices' lives outside of work, it is interesting that they do not perceive it as important to build relationships with parents. The parents could perhaps reinforce the non-technical skills at home. Another compelling insight from the study was that WBL mentors highlighted the difficulty of having to be both a mentor and a manager.

Often, WBL mentors found it hard to possess all of the right characteristics to successfully do both; WBL mentors understood that they had to be “sensitive,” “caring,” “nurturing,” “tough,” “understanding,” “empathetic,” “challenging,” and “rewarding.” The combination of these characteristics creates the recipe for a successful mentor who is able to engage apprentices and manage their performance in a way that allows them to develop the appropriate skills for the workforce and stay with the company after their apprenticeship ends.

Another insight is that WBL mentors are aware of the trends occurring in the emerging workforce, and those trends shaped apprentices thinking about their roles and responsibilities. The two trends that were highlighted in the study were technological advances in the advanced manufacturing industry and the age demographic entering the workforce. Technology is rapidly changing the way machines and tools are being used in the advanced manufacturing industry,

which is forcing WBL mentors to become continuous learners in the industry that is constantly changing. Emerging technology is also shaping the way WBL mentors think about their training for apprentices; they want to make sure that apprentices have experience with both current and future-proof technical skills. In addition to emerging technology, the behavior of the younger generation of apprentices also shapes the way WBL mentors think about their role. In this study, there is a 30-year average age gap between apprentices and their WBL mentors. It is important for WBL mentors to be open and receptive to new ideas and perspectives to ensure that they are developing positive interpersonal relationships. These insights have implications for practice and future research.

### **Implications for Practice**

This study has implications for both strategy for WBL recruitment and WBL mentor training and development. When searching for WBL mentors that are a fit to mentor young apprentices, it will be important to assess individual characteristics that are predictive of successful WBL mentorship. These individual characteristics may include background, prior experience, educational attainment, and personality traits. Specifically, employers should assess a WBL mentor's cultural background for evidence of WBL experiences and evidence that WBL and apprenticeships are a major part of the culture. Prior experiences with apprenticeships or even experiences that would prepare them to mentor or provide guidance to young adults, are other elements that employers should evaluate when selecting a WBL mentor. It will also be important for employers to assess the potential mentor's pedagogical knowledge and experience with implementing effective instructional strategies such as scaffolding, positive feedback mechanisms, and goal setting. It is apparent from both the study and the literature that this should be a fundamental competency WBL mentors should have as it improves the quality of learning

for the apprentices. WBL mentors' experiences with 2-year technical colleges and degree programs such as engineering have shaped their perception of their role that aligns closely to the United States Department of Education's definition. Employers should ensure that their WBL mentors have personalities that align with some of the components of successful WBL. Personality traits such as openness and honesty were identified in the study to shape mentors' sensemaking of their responsibilities and, thus, actions.

This study also has implications for how employers can structure the workplace to shape WBL mentors' actions to better align with successful strategies to implement WBL in apprenticeships. Employers can design learning opportunities that shape WBL mentors' interpretation of their roles, so their actions align closely with successful implementation of WBL. The learning opportunities should consider company culture, and formal and informal learning opportunities. The most influential factor that influenced WBL mentors' sensemaking of their role was the interaction with others. Perhaps employers that are hosting an apprenticeship program should ensure that there are communities of practice for the WBL mentors to consistently interact with other WBL professionals and give them the space to become reflective practitioners. Furthermore, the employer should train their WBL mentors on pedagogical strategies that have been proven to increase the quality of learning for the apprentice. According to the literature, mentors that possess pedagogical knowledge and skills are more likely to successfully implement WBL.

### **Implications for Future Research**

This study highlights how WBL mentors make sense of their roles and responsibilities and the individual and institutional factors that shape sensemaking of the mentors. Ultimately the study sought to add to the research related to sensemaking and gaining a deeper understanding of

the factors shaping sensemaking in regard to WBL mentorship. The study also sought to provide practical implications for enhancing ways to align WBL mentors' perception of their roles and responsibilities with research-proven implementation strategies of WBL. However, there is still limited research that exists around effective implementation of the identified roles and responsibilities of the WBL mentors. Research is also needed around the type and amount of formal mentor training needed to effectively prepare WBL mentors to successfully implement their roles. This type of research is especially important because WBL mentors have identified informal trainings as one of the most influential factors shaping their work as mentors and have expressed that there is a lack of opportunity for formal training to improve mentoring in the workplace. Furthermore, experienced employees need training prior to serving as mentors to new employees especially if they are mentoring in school-to-work programs such as apprenticeships (Price, 1997). For employers, further research is needed to answer vital questions related to if formal training yields better mentoring and/or is it better to focus on recruiting and selecting workers with fitting individual characteristics, to mentor novel workers.

The study revealed how WBL mentors made sense of their roles and they included: facilitating the development of technical and non-technical skills, providing apprentices with guidance and support, building community, managing performance, and improving retention. However, it is important that further research explore the relationship between WBL mentors and apprentice parents. Though apprentices are working in full-time roles, they are still young adults who still have strong ties with parents and guardians. There should be further research to seek to understand why WBL mentors do not consider parent engagement as part of their role. The literature review conducted in study 1 highlights apprentices' personal relationships as a factor shaping self-regulation or self-helping behavior, and thus positively shaping their WBL

experiences. In the literature, a “significant other” is anyone who plays a supportive or constructively significant role in the life of an apprentice and can include parents, friends, and romantic partners (Corney & du Plessis, 2010). In this case, parents would be critical stakeholders shaping successful implementation of WBL.

More empirical studies are needed to determine the influence of organizational hierarchy and structure on the sensemaking of WBL learning professionals. This is highlighted in the literature, but none of the WBL mentors in the study mentioned either one of these factors as having significance influence on the way they interpreted their role. It is also important for research to gain a deeper understanding of how informal learning shapes sensemaking as well. There was strong evidence in the study to suggest that WBL mentors had limited formal training and turned to external opportunities for learning and development.

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**CHAPTER 4: Factors Influencing Apprentices' Engagement with Work-Based Learning in North Carolina Apprenticeships: A Narrative Study Using the Critical Incident Technique (Study 3)**

Apprentices are essential to alleviating the skills gap in which millions of jobs are vacant because there are no skilled workers to fill the positions. For students, apprenticeship programs improve the transition from school to career and upgrade their skill in an industry (Lerman, 2014). Moreover, studies indicate that apprentices do not have to sacrifice earning during their education and training, and that their long-term earnings benefits exceed the gains they would have accumulated after graduating from community college (Hollenbeck, 2008). Employers pay the cost of tuition, books, and fees for the apprentice. In the basic apprenticeship model, students become apprentices once they enter an apprenticeship program where they undertake productive work for an employer, earn a salary, receive training primarily through supervised work-based learning (WBL), and take academic instruction that is related to the apprenticeship occupation (Lerman 2014). Students also learn work-related skills such as interpersonal communication, problem solving, allocation of resources, and interacting with supervisors and coworkers. In the context of this study, apprentices are synonymous with workplace mentees and work alongside workplace mentors to facilitate skill development and engage in work-based learning (WBL). This study explores the experiences of apprentices' engagement during on-the-job training (OJT) and related instruction (RI). Experiences during OJT were explored because OJT is synonymous with work-based learning in a registered apprenticeship, and RI is explored because it is synonymous with classroom instruction in a registered apprenticeship. The concept of engagement in the workplace is explored as apprentices spend most of their learning experience in a workplace setting. Apprentices in the

North Carolina Triangle Apprenticeship Program (NCTAP) only spend 1 day out of the week in related instruction which takes place in a community college classroom.

How apprentices elect to engage with work-based learning in a workplace environment determines the quality of their learning (Billett, 2001). Engaging in quality learning experiences will help apprentices transform into the employees needed by a variety of workforce industries. If students do not have engaging experiences or become disengaged, students become unsatisfied with their experience and end up dropping out or transferring. Ultimately, having an in-depth understanding of students' experiences with WBL will result in a set of recommendations for program developers, mentors, and instructors to discover best practices to increase engagement and, ultimately, to help apprentice become skilled employees and persist through apprenticeship programs (Chan, 2016).

This study contributes to the literature related to engagement in the workplace (Rich et al., 2010; Saks, 2006; Wefald & Downey, 2009), while scholarly research on this topic is in early stages of development. Accurate information on drivers and threats to workplace engagement is vital to human resource departments that need the ability to design interventions to increase the drivers and reduce the threats to engagement. Work engagement also increases profitability through higher productivity, sales, customer satisfaction, and employee retention (Leiter & Bakker, 2010). Therefore, employers benefit more from research that focuses on factors that influence employee engagement. Employees also benefit from learning about engagement, as demonstrating their personal energy, dedication, and efficacy opens opportunities for career advanced (Leiter & Bakker, 2010).

The literature review explores the conceptual framework of engagement related to the workplace. The study utilizes narrative inquiry to examine the life experiences of apprentices to

understand their engagement with WBL in apprenticeships. The following research questions guided the study:

1. Which individual and institutional factors shape apprentices' engagement during work-based learning in an apprenticeship program?
2. How do apprentices' experiences during classroom instruction shape apprentices' overall engagement in an apprenticeship program?

### **Defining Engagement in the Workplace**

Most of the current literature related to workplace learning in apprenticeships focus on factors impacting retention rates (Glover & Bilginsoy, 2003; Casey, 1986; Chan, 2016; Harris & Simons, 2005). This study shifts the focus from retention to engagement because, engagement in the workplace shapes the quality and nature of the learning experiences (Taylor & Freeman, 2011). Furthermore, the quality of the learning experiences indicates the quality of employee that develops from participation in the apprenticeship program. Much interest has developed from employers regarding the research on engagement because it yields tremendous long-term benefits financially. Furthermore, there has been surprisingly little academic and empirical research on a topic that has become so popular (Robinson, Perryman, & Hayday, 2004).

There are four main approaches to defining engagement in the workplace that have dominated the academic literature since 1990: the needs-satisfying approach, the satisfaction-engagement approach, the multidimensional approach, and the burnout-antithesis approach.

The needs-satisfying approach was described by William Kahn in his 1990 research article "Psychological Conditions of Personal Engagement and Disengagement at Work." The overall purpose of the work was to explain how individuals engage in the workplace physically,



cognitively, and emotionally. Kahn (1990) is credited with conceptualizing engagement within a workplace context and defines engagement as “the simultaneous employment and expression of a person’s ‘preferred self’ in task behaviors that promote connections to work to others, personal presence and active, full role performances” (p. 700). Furthermore, Kahn defined engagement as having three psychological domains: meaningfulness, safety, and availability where availability is defined as the resources, they perceive themselves to have (Kahn, 1990). This approach has been critiqued and has shaped the literature on engagement throughout the years.

The satisfaction-engagement approach was explained by Harter and his colleagues (2002) in “Business-Unit-Level Relationship between Employee Satisfaction, Employee Engagement, and Business Outcomes: A Meta-Analysis,” wherein they define engagement as “an individual’s involvement and satisfaction with as well as enthusiasm for work” (p. 269). This approach differs from Kahn’s approach by introducing the concepts of job involvement and job satisfaction and has a positive relationship to outcomes such as customer satisfaction, turnover, safety, productivity, and profitability (Schaufeli, 2013). This approach measured the antecedents of engagement in terms of perceived job resources and is accompanied by the Gallop<sup>12</sup> instrument, which was developed from a practical use, not from a scholarly one, which is why this definition was not incorporated in this study.

Saks (2006) defined employee engagement as a “distinct and unique construct consisting of cognitive, emotional, and behavioral components that are associated with individual role and performance” (p. 602). Saks is credited with conceptualizing employee engagement as having two distinct characteristics: job engagement (performing the work role) and organizational engagement (performing the role as a member of the organization). Results

from his study suggested that supportive climate, job characteristics, and fairness influenced the development of engagement (Saks, 2006).

The last approach was defined Schaufeli and his colleagues (2006), who considered engagement as a distinct and independent concept from burnout, defining engagement as a “positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption” (p. 702). Most academic research on engagement in the workplace uses the conceptualization developed by Schaufeli et al. (2006) (e.g., Altunel, Kocak, & Cankir, 2015; Fearon, McLaughlin & Morris, 2013; Klassen, Yerdelen, & Durksen, 2013; Mauno, Kinnunen, & Ruokolainen, 2006; Salmela-Aro, Tolvanen, & Nurmi, 2011; Schaufeli, Bakker, & Salanova, 2006; Shirom, 2003; Weigl et al., 2010) that focuses on workplace engagement from a needs-satisfying approach. Furthermore, Schaufeli et al.’s (2006) definition and description of engagement guides this study; this definition was used as a framework to examine the engagement of apprentices’ who participated in WBL in a variety of capacities within the workplace.

### **Conceptual Framework**

According to Schaufeli et al. (2006), engagement in the workplace is characterized by three dimensions: vigor, dedication, and absorption. Vigor refers to employees’ high levels of energy and mental resilience while working, their willingness to invest effort in work, and their persistence even in the face of difficulties. Dedication is characterized by an employee’s sense of significance, enthusiasm, inspiration, pride, and challenge. Absorption is defined as an employee’s being fully concentrated and deeply engrossed in one’s work, whereby time passes quickly, and one has difficulties with detaching oneself from the work. This study examines the factors that shape engagement in the workplace during OJT and RI to get a comprehensive

understanding of apprentices' experiences with engagement with WBL in an apprenticeship context.

### **Factors Shaping Engagement in the Workplace**

#### **Individual Factors**

Several individual factors such as agency and intentionality mediate and shape engagement in the workplace. According to Billet (2001, 2002, 2004), engagement is mediated by individuals' existing knowledge, values, occupational identity, belief in the meaning behind the work, socially constituted personal histories, and individual interests. Tim Swanwick (2005) explored individual engagement in the workplace in the context of graduate medical education and suggested that engagement was contingent upon the relatedness of the individual's interests and values with those of the social practice. Emerging research has found that engagement is also influenced by the autonomy and flexibility that the workplace affords (REF). Employees have high expectations about participating in organizational decision-making, pursuing dynamic involvement in organizational activities, and actively seeking work contexts where they believe they are treated with respect and fairness (Burke & Ng, 2006; Shuck & Herd, 2012).

#### **Institutional Factors**

Although work engagement is the individual experience of workers, it does not occur without the presence of institutional factors such as workers' interactions with other workers and supervisors and company culture and expectations (Billet, 2001, 2002, 2004). Work activities, the actual workplace environment, and other workers are key sources for workers to engage and learn their vocational activities through work (Billet, 2001). Other factors that influence engagement in the workplace include employment status, workplace democracies,

workplace cliques, and affiliations (Billet, 2001). Research on institutional factors that influence engagement in the workplace suggests that leadership is a major factor and that high engagement behavior emerges when leaders influence environmental factors conducive for engagement to develop (Shuck & Herd, 2012).

## **Methodology**

### **Constructivist Perspective**

According to Yazan (2015), researchers' views about the nature and production of knowledge permeates every step of the entire investigation process, from selection of the phenomenon of interest to the way the ultimate report is composed. Constructivism is the epistemological worldview under which this study was carried out and integrated into the investigation process. According to constructivists, humans have no access to an objective reality; therefore, we construct our knowledge of our world from our experiences, which are mediated through our previous knowledge (Merriam, 2009; Simon, 1995). Researchers also construct knowledge and find meaning from others' perceptions and experiences. According to Creswell and Creswell (2017), these meanings have both social and historical dimensions and are formed through interaction with others and through historical and cultural norms that operate in individuals' lives. The purpose of this study was to describe, understand, and interpret the factors that affect apprentices' engagement in advanced manufacturing apprenticeship programs from a constructivist perspective. In constructivist study, theory and practice are fundamentally interlined (Mir & Watson, 2000). Interviews and document reviews were used because these methods are predominant in the constructivist paradigm and are applied in correspondence with the philosophical assumption about social construction of

reality in which research can be conducted only through interaction between and among investigator and respondents (Mertens, 2014).

The work of Sharan Merriam (2009) guided the methodology of this study because of her constructivist worldview, which aligns with the worldview from which this study is being examined. According to Merriam (2009), constructivist research assumes “reality is socially constructed, that is, there is no single, observable reality. Rather there are multiple realities, or interpretations, of a single event” (p. 8). In the context of this study, engagement is assumed to be socially situated and was best examined by using Merriam’s constructivist.

### **Qualitative Research Methods**

The most concise definition for a narrative seen in literature is a story with a beginning, a middle, and an end (Delamont, 2012). Narrative approaches were conceptualized by Dr. Connelly and Dr. Clandinin (1990). Furthermore, narrative is a way of understanding experience and is co-constructed by the researcher and the participant (Lindsay & Schwind, 2016). In the context of this study, apprentices are the storytellers who told stories of their experiences with engagement during WBL activities while in an apprenticeship. It was the job of the researcher to examine, interpret, and explain these stories and experiences of apprentices to answer the research questions. Stories about their experiences during the internship experience were solicited during individual interviews with participants as described below.

### **Participants and Sampling Procedure**

Apprentices in the advanced manufacturing industry of the North Carolina Triangle Apprenticeship Program (NCTAP) were invited to participate in this study of their experiences during their internships. The NCTAP is comprised of a partnership between community

colleges and advanced manufacturing companies. NCTAP combines on-the-job training and academic instruction and participants typically spend four years in the program.

The students were selected through snowball sampling procedures. Snowball sampling is often used when “locating special populations where the focus of the study is on a sensitive issue” (Faugier & Sargeant, 1997). After the researcher had collected data from these few key participants, the participants are asked to refer to other participants that match the inclusion criterion defined by the researcher (Faugier & Sargeant, 1997; Merriam, 2009; 2008). In this study, the first students were selected after WBL mentor interviews; I asked WBL mentors to refer apprentices that met the inclusion criteria. Once I got the first set of apprentices, I begin to continue asking WBL mentors and apprentices to refer their peers. The selection criteria for the students included being at least 18 years of age and employed with a company in the advanced manufacturing industry within NCTAP. This snowball sampling procedure continued until a total of 9 apprentices had been located for data collection. Table 4.1 lists and describes the participants. For maximum variation, the study sought to include apprentices that represent diversity in gender, socio-economic status, education, and workplace environment.

Table 4.1.

*Participant Profiles*

Name	Age		Company Description	Highest level of educational attainment
Arya Wallcopper	18	Morrisville, North Carolina	manufactures industrial systems for drying, roasting and toasting food products such as french fries and breakfast cereals	High School Diploma
Frank Griffin	21	Garner, North Carolina	manufactures industrial systems for drying, roasting and toasting food products such as french fries and breakfast cereals	High School Diploma
Percy McKeggory	22	Morrisville, North Carolina	manufactures industrial systems for drying, roasting and toasting food products such as french fries and breakfast cereals	High School Diploma
Sampson Mortimer	19	Phoenixville, Pennsylvania	manufacturer of commercial kitchen ventilation systems	High School Diploma
James Hughes	19	Louisburg, North Carolina	manufacturer of commercial kitchen ventilation system	High School Diploma
Rick Doe	22	Frankfurt, Germany	manufactures industrial systems for drying, roasting and toasting food products such as french fries and breakfast cereals	Undergraduate Degree
Mike Martin	19	Norwalk, Ohio	supplier of gripping systems and clamping technology for a variety of industries and applications.	High School Diploma
John smith	18	Fuquay Varina, North Carolina	Manufacturers of ice equipment	High School Diploma
Chad Williams	18	Garner, North Carolina	Manufacturers of ice equipment	High School Diploma

## **Narrative Inquiry and Critical Incident Technique**

The most concise definition for a narrative seen in literature is a story with a beginning, a middle, and an end (Delamont, 2012). Narrative inquiry is most known for being conceptualized by Dr. Connelly and Dr. Clandinin in higher education. Both researchers suggest that narrative inquiry has been increasingly used to research educational experience because humans are storytelling organisms who, individually and socially, lead storied lives (Connelly and Clandinin 1990). Furthermore, narrative inquiry is a way of understanding experience and is co-constructed by the researcher and the participant (Lindsay & Schwind, 2016). In the context of this study, apprentices will be the storytellers and will tell stories of their experiences with engagement during work-based learning activities while in an apprenticeship. It will be the job of the researcher to, examine, interpret, and explain these stories and experiences of apprentices, to answer the research questions.

The stories that the apprentices told were in the form of critical incidents. Critical incident technique (CIT) is the qualitative research approach that was utilized in this study. This research technique became widely recognized and well proven since being introduced by John Flanagan in 1954. Flanagan (1954) explains that critical incident technique is: w

a set of procedures for collecting direct observations of human behavior in such a way as to facilitate their potential usefulness in solving practical problems and developing broad psychological principles. The critical incident technique outlines procedures for collected observed incidents having special significance and meeting systematically defined criteria). (p. 327)

Furthermore, CIT has been utilized across a diverse number of disciplines including job analysis, education and teaching, organizational learning, psychology, and social work



(Kanyangale & MacLachlan, 1995; Stitt-Gohdes et al., 2000; Le Mare and Sohbat, 2002; Oaklief, 1976; Ellinger and Bostrom, 2002). “Critical incident” often implies a major crisis or turning point and they represent aspects of human experience that are significant to the individual concerned (Hughes et al. 2017). In this study, the apprentices’ “critical incident” was used as a moment of engagement in both the workplace and in the classroom. CIT was also used because of its flexibility and interdisciplinary application and CIT; per Flanagan (1954), “it does not consist of a single rigid set of rules governing such data collection. Rather it should be thought of as a flexible set of principles that must be modified and adapted to meet the specific situation at hand” (p. 335). The way CIT is designed, it made it easier to identify the factors that shaped engagement both in the workplace and in the classroom because it emphasizes the moment, setting, actors involved, and the outcome or impact the moment had on the individual.

### **Data Collection**

Three methods of data collection through semi-structured interviews, document analysis, and field notes were utilized to gain an in-depth understanding of the factors that shape apprentices’ engagement in WBL activities in advanced manufacturing apprenticeships. This approach was outlined by Merriam (2009), who contends that qualitative data collection consists of direct quotations from people about their experiences through interviews and excerpts, quotations, and entire passages extracted from various types of documents.

An in-depth interview is a guided conversation or narrative designed to elicit depth on a topic of interest (Namey & Trotter, 2015). These types of interviews are usually comprised of one-on-one and open-ended questioning, uses inductive probing to get depth, and looks and feels like a conversation (Namey & Trotter, 2015). A semi-structured interview allows the

researcher to provide a small degree of structure and guidance, hence *semi*, during the discussion with the participant. The strengths of using a semi-structured in-depth interviewing technique is that it allows researchers to get in-depth answers to their questions from experts on the issue, is helpful for answering the how and why of processes, and is more likely to capture individuals' personal opinions and values rather than public or expected beliefs and values (Namey & Trotter, 2015). Delamont (2012) asserts that interviews should be framed using everyday rather than sociological language, and that the best questions for narrative interviews allow interviewees to discuss specific stories, rather eliciting the interviewees' entire life story. The interview protocol is in Appendix B.

The initial interview was broken into three parts: introductory and demographic questions, discussion guided semi-structured and open-ended questions to explore student experiences and concluding comments. The initial interviews were approximately 60 minutes and no interviews exceeded time. Interviews were recorded electronically via Zoom. The interviews were downloaded on a secure NCSU Google drive and audio files were uploaded on Rev.com and transcribed using the "transcription" option, in which they guaranteed 99% accuracy. Interview transcripts were cleaned using the "remove filler words" option on Rev.com. To improve validity, member checks were utilized. Member checks included soliciting feedback on the emerging findings from the participants being interviewed (Merriam, 2009) and sending the participants a transcription of the interview to clarify anything that was unclear or ambiguous (Namey & Trotter, 2015). These communications also became part of the ongoing narrative record (Connelly & Clandinin, 1990).

After participants completed their first interview, they were given a prompt which guided the conversation of the follow-up interview. The participants were asked to present one

or two photos that were representative of their engagement with the workplace. Subsequently, we scheduled a follow-up interview in which we discussed the photos that were chosen and further explored their reasons for selection. Fewer questions were asked in this follow-up interview to give participants a chance to describe their story or association between the photos and their feelings toward their apprenticeship. Calls via Zoom were used for follow-up interviews after the first round. Field notes were also collected during and after each interview to maintain the context of the interview. Notes included my reactions to the photos before the interview and my reactions to the photos post interview.

Document review was another form of data collection that enhances the credibility of the study. Documents provide data on the context within which research participants operated, contained information that suggested some questions that needed to be asked and situations that needed to be observed as part of the research, provided supplementary research data that was valuable in addition to a knowledge base, and provided a means of tracking change and development (Bowen, 2009). Websites and program brochures were reviewed to corroborate the programmatic and institutional factors that apprentices described as shaping their engagement in the program. Apprentices' social media pages were also examined to identify, through the items that they posted, what elements of their WBL experiences were engaging to them.

Field notes were another source of data that I incorporated into data collection. Field notes can be defined as “detailed, non-judgmental, concrete descriptions of what has been observed” (Marshall & Rossman, 2011, p. 139). Field notes have had a significant role in data collection and analysis in qualitative research by providing a thick description in which a researcher not only describes behavior but the context as well and is able to reveal how people

make meaning of their social worlds (Geertz, 1973). Furthermore, field notes are authored representations of ongoing social life (Emerson, 2001, p. 132). Notes taken in the field serve to remind researchers of significant actions or possible connections to larger themes and allows researchers to integrate their own reactions and perceptions (Emerson et al., 1995; Saldana, 2009). Notes were taken throughout the entire study, from conducting interviews to analyzing data. Specifically, pre-defined codes from the literature review were stored in the field notes, which allowed for the tracking of existing themes and emerging themes during interviews and data analysis processes.

### **Data Analysis**

To prepare for data analysis, I created a case record that included all the information that was to be utilized to do the case analysis. Subsequently, I created a case database which included all the data of the study organized in a way that was easily accessible for intensive data analysis (Merriam, 2009). To increase the external validity of the study, there were two stages of analysis: the individual critical incidents and the collected analyses of all of the critical incidents. Once the individual analysis was complete, the collective analysis was conducted to build abstractions across individual incidents and build a general explanation that fitted the individuals (Merriam, 1998).

The semi-structured in-depth interviews were transcribed verbatim using a professional company. The transcripts will then be entered in a qualitative research software program, ATLAS-ti, where the data was organized and coded. Narrative thematic analysis (NTA) was utilized to analyze the narrative data, which focused exclusively on the narrative's content rather than how the story was structured (Reissman, 2008).

Provisional codes were created based on research from the literature review. Those codes were applied to the interview data initially. Subsequently, open and thematic coding followed for the remaining analysis of the data. Coding is the process of marking segments of data (usually text data) with symbols, descriptive words, or category names (Johnson & Christensen, 2015). Miles and Huberman (1994) suggest that codes are labels for assigning meaning to information extracted during the study. Merriam (2009) describes this process as category construction. This is where I read the first interview transcript and jotted down notes, comments, and observations to start the *open coding* process (Merriam, 2009). Using critical incident techniques made it easier to code the moment that was described by the apprentice and the outcome and impact of the moment on their overall experience in an apprenticeship. The overall moment being described by the apprentice was an engaging moment because it was a moment that apprentices remembered and thus was a moment that had characteristics used for engagement: meaningful, purposeful, enjoyable, fun, challenging, or inspirational. More importantly, these moments aligned with elements of vigor, dedication, and absorption. Thus, open coding started with using provisional codes, individual and institutional factors, to answer the first research question and determine which factors were shaping the engaging moment.

After creating open codes, I began grouping my open codes into categories in a process called thematic coding. Categories or themes were responsive to the purpose of the research, exhaustive, mutually exclusive, sensitizing, and conceptually congruent (Merriam, 2009). The codes from my first transcript were extracted and used to code the second transcript to see if the same codes were present. This process continued until no new information was discovered. According to Merriam (2009), the initial inductive process of coding becomes a deductive process once no new information is discovered. Final codes are shown in Appendix G.

Document analysis is a systematic procedure for reviewing or evaluating printed or electronic documents that involves skimming, reading, and interpretation (Bowen, 2009). Document analysis requires that data be examined and interpreted to elicit meaning, gain understanding, and develop empirical knowledge (Corbin & Strauss, 2008). In this case, predefined codes from the interviews were used to examine and interpret the documents. Bowen (2009) explains “predefined codes may be used, especially if the document analysis is supplementary to other research methods employed in the study...the codes used in interview transcripts, for example, may be applied to the content of documents” (p. 32). Once the documents were analyzed with predetermined codes, there were no new themes or categories that emerged, and the findings were added to the case records.

### **Validity, Reliability, and Ethical Considerations**

The steps taken in this study were guided by a goal of validity, reliability, and ethical considerations to ensure the highest quality of research was achieved. High internal validity was achieved through the triangulation of data collection, member checks, and disclosure of research bias. Data collection methods included interviews, prompts, document collection and field notes. Member checks were utilized after interviews had been completed. Disclosure of research bias was also articulated to demonstrate that as the researcher, I understood my biases and I made sure that those did not permeate into the research. To ensure reliability, I included a positionality statement, triangulation, and use of an audit trail. A positionality statement articulated my background and my bias related to the study. Triangulation of data collection not only increased internal validity, but also increased reliability. An audit trail was utilized so that readers could follow my logic as a researcher throughout the study. The use of thick descriptions from interviews and documents such as direct quotes were used to increase

external validity. Creating typicality or modal categories and the use of a multi-site design also ensured high external validity.

In all research, the audience must trust that the study was carried out with integrity that involves the ethical stance of the researcher (Merriam, 2009). Ethics was considered during data collection and dissemination of findings. During the semi-structured interviews, I ensured that the participants had a right to privacy, informed consent was evident, and there was no deception regarding the purpose of the study and how the results were going to be disseminated. Protecting the identity of apprentices in this study was important because I wanted to ensure that they were not subject to discipline from their supervisors for revealing elements of their work experience that may portray the supervisor in a negative light. The privacy of company documents were also considered so that certain types of information that were used in data analysis were first aggregated into an anonymous form and could not be traced to any particular person. With the dissemination of findings, I did not exclude any information because it would have contradicted my views as a researcher.

### **Positionality**

This study sought to identify and describe factors related to apprentice engagement in an advanced manufacturing apprenticeship program. I have completed a literature review on engagement and have read about engagement in other contexts. However, the findings in the literature did not interfere with my obtaining authentic and unbiased data that may or may not align with those discovered in the literature. I have also been an employee in several professional workplace settings, and I have personal experiences with employee engagement and personal opinions about what affects engagement in the workplace. However, this position

did not permeate into any element of the study, especially data collection, analysis, or dissemination of findings.

### **Limitations/Delimitations**

There were several limitations to the study. One of the limitations in the study was that the study was limited to advanced manufacturing apprenticeship programs. The participants had unique experiences in the workplace, and outcomes that were specific to the industry and specific to their respective WBL environments. This limited the transferability of findings from the study to other apprenticeship program industries such as healthcare, IT, and construction. I chose this apprenticeship program because of proximity and convenience for collecting data. The timeline of data collection was another limitation. I collected data over a three-month period because it was a timeline that was agreed upon with program supervisors. The type of apprenticeship program was also a limitation. There are a variety of registered apprenticeship programs that offer unique experiences for core implementers and apprentices. These sites incorporate a 4-year hybrid model that combines on-the-job training with related instruction and apprentices are assessed through time-based assessments.

### **Findings**

The purpose of this study was to describe which individual and institutional factors shaped apprentice engagement during WBL in an apprenticeship context, and how their experiences with related instruction shaped their overall engagement in the apprenticeship program. The findings from this study will inform both individual and institutional factors that may shape apprentices' engagement in WBL apprenticeships.

Individual engagement factors revealed through interviews included self-gratification, personal interest, and personality traits. Institutional factors that participants described were



related to what the workplace could afford to the apprentices: workplace activities that cultivated skill development, positive workplace relationships, and a culture that promotes learning. The findings also revealed that related instruction deepened apprentices' sense of belonging, made work-based learning in the workplace more relevant, increased motivation in overall program, and made the overall program more enjoyable. These findings are summarized in Figure 4.1 and will be described in detail below.

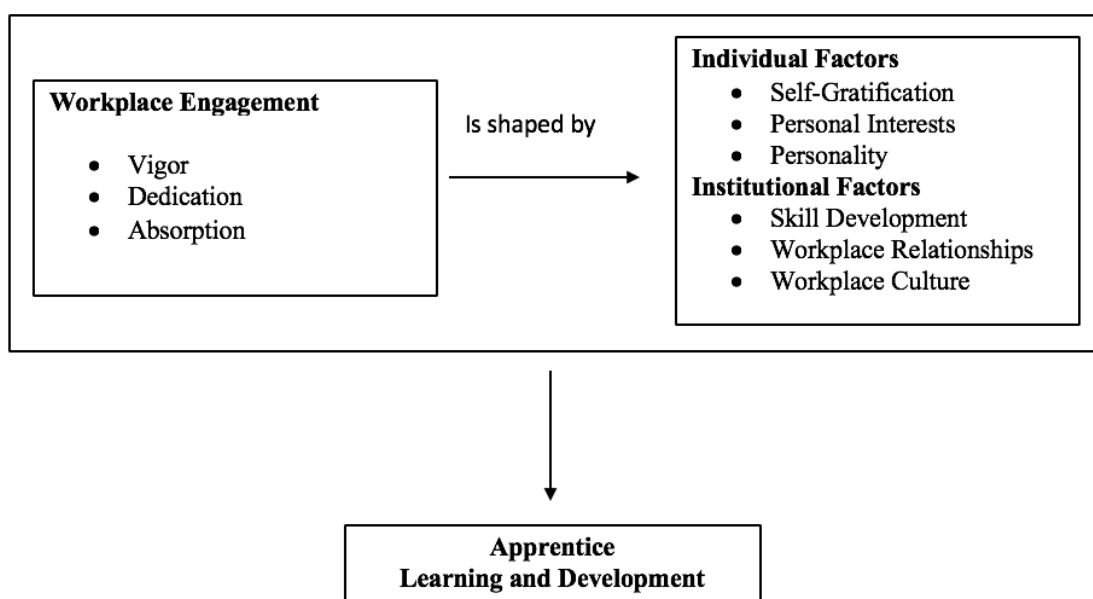


Figure 4.1. Factors Shaping Apprentice Engagement

### Individual Factors Shaping Apprentices Engagement

**Self-Gratification.** Self-gratification is the ability to satisfy one's own desires. The concept of self-gratification is highlighted throughout the study as an individual factor shaping an apprentices' engagement. In this study, self-gratification was connected to the apprentices' ability to satisfy their own desires to yield work outcomes that were "pretty cool" or that ensured them that they were "on the right path." Chad described an early experience with welding and

explained that his self-gratification comes from the outcomes that he yielded as a welder:

“Welding and building stuff... really solidified my choice here. Like I said, I don’t really feel like I worked that much ‘cause I like what I do...every time I get done on it, I just look back at it. I’m like, wow, that’s, pretty cool. I did that. I built that.” He also describes his favorite part of being an apprentice:

Seeing the finished product is my favorite part for this. Just seeing these ginormous machines and knowing that they’re going to airports and nuclear plants and things like that and everything. And that’s just really cool to me. Seeing the finished product and how big it is and seeing it all work without a fail. That’s honestly just really, really fun and really cool to me.

Sampson was another apprentice who described a critical incident that highlighted self-gratification. Sampson was given the responsibility as a first-year apprentice to work with a group of engineers from Italy, as his company had recently purchased equipment that costs upwards of a few million dollars. Sampson explains his excitement:

Working with the engineers out of Italy and working with the engineers in our plant...it really clicked for me. Just the excitement and the suspense of being able to make...big things work...big things being those machines and big things being like our company in this industry like this, that’s what its fueled by [his engagement] and it’s something that I really, really enjoy.

John’s critical reflection shows that his self-gratification came from the idea of being able to avoid debt and from the opportunity of being able to start his career. When John first began to work with his company as an intern, a worker came to him and attempted to discourage John from taking a full-time role as an apprentice. The disgruntled worker told John that they were

similar and he, too, had the grades to go to a 4-year university and passed the opportunity. Moreover, the worker did not want John to make the same mistake. This experience made John reflect on his decision to continue working in an apprenticeship. Furthermore, the experience merely reaffirmed his decision to continue working within the apprenticeship program because he was getting the self-gratification of being able to get work experience, avoid college debt, start a career, and more importantly have the flexibility to transfer jobs or career if needed. John explains:

There was this one time during the summer when I was kind of still an intern. Dude came up to me like [hey man, like if I'm being honest...go to school. You don't want to work here for the rest of your life]. Kind of only made me rethink like, am I doing the right thing? I am doing the right thing because I am still going to school and I am going to get a higher degree so that I'm not going to be stuck somewhere...work experience so that it can...help me do further things in life and go up the ladder...I wasn't going into debt and I was still getting my career degree that can help me...I can transfer after I get the two year degree and, get a four year degree. I realize it was eye opening that I'm not going to be stuck here. I have so many options...just kind of made me step back and re look at all the perks of it.

Arya, one of the few female apprentices in the program, also gets self-gratification from welding: “It [welding] looked really, really cool. It makes me feel very good because it's a skill that I have acquired that I have the capacity to improve and perfect.”

These results show how the apprentices engaged in work that would give them self-gratification; apprentices were eager to engage in work that was “really cool,” put them on the right track for their career, and that allowed them to build “ginormous” machines.

Another underlying concept highlighted by the apprentices was their satisfaction associated with successfully accomplishing a task. Chad's accomplishment was his ability to finish his welding project. Sampson's accomplishment was being given higher responsibilities in his company, responsibilities that no other apprentice ever got. John's accomplishment was being able to avoid debt and starting his career with work experience. Other apprentices described similar examples of accomplishment associated with completing tasks, fulfilling responsibilities, and advancing their professional career.

**Personal interest.** WBL is hands-on and requires workers, specifically the apprentices, to work with their hands on a daily basis. Specific WBL in this study included gaining technical skills such as welding and drafting. In this study, apprentices' engagement was shaped by their personal interest in both general WBL and the specific technical skill they are cultivating at work. There is evidence from the apprentices' critical reflections to suggest that personal interest in WBL excites them and makes them want to put effort into getting better at the skill. Furthermore, many of the apprentices describe themselves as "hands-on" and even cite evidence from high school that they liked to "work with their hands." As Percy McKeegory describes, "I learned more hands-on...by doing." John Smith explains, "I like to work with my hands...I get to work with my hands every single day instead of going to class." Rick Doe agrees: "I kind of wanted to get hands on learning at the same time...I need to see it...I need it in my hands," as does Sampson Mortimer, who says, "I always had an interest in working with my hands." James loved WBL in high school, specifically automotive mechanics and construction. He enjoyed WBL so much he "took all the levels" of automotive mechanics and construction, hoping that the classes would never end. Those classes led him to believe that he wanted to pursue a career in WBL because "it was the kind of work that I [he] was interested in."

The study also suggests that apprentices not only have a personal interest in WBL, but they prefer WBL over traditional classroom learning; they feel it's more engaging. Rick believed that traditional high school courses did not have real-life applicability. However, his narrative about WBL was different: "We're reading this stuff in textbooks and then the next day, you're on the manufacturing floor and doing what you're learning about." Sampson also explains that he prefers WBL learning over traditional classroom learning because of the hands-on experience: "Everything that I learn, I get to put to use on a daily basis...I've learned more there, working with my hands that I ever have in school. I'll also get to apply it every day."

The apprentices also really enjoy the nature of the specific technical work in their respective settings. Chad specifically cites his liking of the line of work, specifically welding, as a factor that shaped the vigor aspect of engagement and "makes [him] want to come to work".

According to Chad:

It might be the fact that I honestly just really love welding. Like that's just something that it took me a good week and a half to two weeks to start to get the hang of it when I first started here. But once I started getting the hang of it that was just something that I wanted to do. And, now that I do it every day, I love coming to work every day just about...I get up every morning wanting to come to where I get up...I even get here early just so I can start on time right at seven o'clock.

Other apprentices explain that welding engages them throughout his apprenticeship program. As John says, "I really appreciated when I get to weld... I was already extremely engaged in what we were doing...I mean I always enjoyed working with my hands. It was just enjoyable for me."

Arya Wallcopper explains that "welding at work...I really, really enjoy welding."

**Personality.** Having optimistic personalities was another factor that shaped apprentices' engagement in this study. Apprentices told stories of unfavorable situations that may have caused them to disengage from their apprenticeship program altogether, but it was their optimism that shaped their vigor and helped them persist through difficulties. John's critical reflection highlighted his ability to satisfy his need to achieve the accomplishment of not having debt and starting his career with work experience. His narrative also demonstrates his ability to be optimistic. On John's second day of his summer internship with his company, one of the workers came up to him and attempted to discourage him from becoming a full-time apprentice. The worker stated that he didn't want John to end up in the company for the rest of his life, a decision that the worker now regrets. John reflected on his decision to enter the apprenticeship program and disregarded the negative aspects that were expressed by the worker and only looked at the positive attributes of the apprenticeship.

It made me realize that I wasn't going to be stuck...I look at all the positives of the apprenticeship...I was going to get work experience. I wasn't going into debt and I was getting, I'm still getting a career degree that can help me. I can transfer after I get that two year degree, and go get a four year degree...it was eye opening that I'm not going to be stuck here. I have so many options...just kind of made me step back and relook at all the perks of it.

James's critical reflection goes back to his second year as an apprentice when he was able to start working with CNC machines. James describes this as a major moment in his experience as an apprentice because it was something that he was promised and was not able to do until that moment. Moreover, at the beginning of his apprenticeship, his WBL mentor promised that he would be able to work with CNC machines and other tasks that he deemed interesting. However,

throughout his first year and into his second year, his WBL mentor had not kept his promise. When James was asked how he felt about it, he admitted that he didn't like it, but nonetheless turned the experience into a learning opportunity. His optimism kept him resilient and persistent through those frustrating times. He eventually went to his WBL mentor and vocalized his expectations. Moreover, James' optimism did not allow him to become disengaged, but to become even more engaged once he was able to participate in work he had wanted to do for a few years.

Arya's critical reflection about her experience with related instruction demonstrates her unfavorable attitude toward classroom learning at the local community college. Arya explains that related instruction is quite mundane and is an experience that she hopes will become more interesting. She explains:

Every week is different, but the routine is the same. And so there it feels kind of mundane a little bit, you know, but the classroom ends up being a little bit sleepy, you know, if you didn't have the greatest night in the whole world. Sometimes it's difficult to stay awake, but, luckily I haven't had any issues with falling asleep in class, you know, so I mean, that's it really. I mean, it'll be okay in the end. Like it's not that boring.

Even in this excerpt, Arya finishes the statement moving in a more positive direction. Though she believes related instruction is boring, it does not affect her overall engagement with the apprenticeship program. In fact, when Arya is asked if her related instruction experiences impact her overall engagement in the apprenticeship program, she begins to move toward a positive response:

Oh, not really...it didn't have a negative effect on my attitude towards my apprenticeship because I knew it's helping me become more well- rounded... they're intentionally putting

care into training me in my group to be great employees... that will benefit the company. They're putting their time and their effort to train us as well as they can. So, that's kind of my attitude on it. So even though it's boring, there's a more positive, thought process underneath.

John, James, and Arya's optimism have allowed them to stay invigorated and thus engaged through the entirety of their apprenticeship. John was able to look past the negative aspects of the apprenticeship and see the perks, James was able to wait patiently for an opportunity that he was promised almost two years before, and Arya was able to look past unfavorable related instruction experiences and see how beneficial it is to the overall apprenticeship experience. Optimism is a personality trait that has allowed engagement, and more specifically vigor, to persist in apprentices in this study.

### **Institutional Factors Shaping Apprentices Engagement with WBL in Apprenticeships**

**Workplace activities that develop skills.** There is strong evidence from the interviews that suggests work activities that develop technical skills shape apprentices' engagement throughout their WBL experiences. Technical skills are "subject-specific or content-specific knowledge and competence relevant to, or within, a particular discipline" (Cassidy, 2006). In this case, technical skills refer to the skills required for apprentices to be employed in the advanced manufacturing industry such as welding and drafting. More importantly, employers provide experiences for technical skill development and allow apprentices to move around the facilities and develop a variety of technical skills. Furthermore, apprentices believe that the technical skills they were developing would be beneficial to their future careers. Though developing technical skills shaped all three aspects of engagement, vigor had the highest frequency of codes



in the study. This aligns with apprentices' viewing the technical skills as beneficial to their future career, thus inspiring them to put energy and effort into continuing to cultivate those skills.

In Chad's critical reflection, it is evident that the workplace's ability to provide a space for him to do things he enjoys shaped his engagement in the workplace. He explains, "We make ice makers and chicken coolers that cool dead birds and everything...I started welding, that really changed the way I thought about coming to work. Once I got the hang of it and everything and I learned that I really liked doing this." Sampson's workplace also afforded him an opportunity to develop skills as a welder: "Welding...that's one of my favorites that I've learned so far...having the flexibility to have the opportunity to take time to learn those kinds of things."

Percy's narrative highlighted the opportunity to learn skills in several areas around the facility:

Something I really enjoy about working here is all of the experiences...not only do I work on the floor, I've spent about nine months working in the office in the procurement department helping buy actual parts for machines... I was out in the apprentice area, mostly just practicing all the time...but it was fun...just opening up new pathways in my head and that's just, it's really neat, very emotional.

Arya also valued her technical skill development and explained, "Welding. . .makes me feel very good because it's a skill that I have acquired that I have the capability to improve and perfect it." She further explains, "We had a block project, which is basically getting us trained on filing...hand tools, drilling...I thought it was the coolest thing ever." Frank explicitly names the developing of technical skills as "valuable" and at this company he is "getting real skills that...are valuable...learn something enriching."

The ability of the workplace to afford activities that present apprentices opportunities for non-technical skills development was another top institutional factor that shaped engagement

with WBL in apprenticeships. Non-technical skills “include basic skills such as oral communication, reading, writing and arithmetic, higher order skills such as learning skills and strategies, problem solving, decision making, and effective skills and traits such as dependability and responsibility, a positive attitude, interpersonal skills (teamwork), self-discipline and self-management and ability to work without supervision” (Cotton, 2001).

James and Rick both described experiences that highlight their workplaces’ ability to develop more than the technical skills needed for completing a job. One such skill they were afforded was opportunities to develop non-technical skills such as how to communicate. James’ narrative specifically highlights a learning experience that improved his ability to communicate his needs and desires in a way that was both clear and professional. He explains, “I learned that I speak up for the stuff that I really wanted...that was a big thing for me...to speak up for myself and learning that I needed to start asking more questions.” Rick’s narrative highlights his workplace’s ability to afford him opportunities to improve his communication skills and behave in a professional manner: “I learned how to communicate...early on I really learned how to carry myself in a professional manner...you want to know how to communicate firmly with everybody and you want to be able to be held accountable for your actions.”

The study also suggests that work activities that are meaningful to the apprentice shape the apprentices’ engagement. Frank, Arya, and Percy all shared narratives that highlight the role that meaningful work has in their engagement. Frank describes a discussion he had with his WBL mentor about the meaning behind the work he was doing. This experience has been coded as relating to Frank’s engagement because Frank explains that the conversation changed his mindset about his apprenticeship. For Frank, understanding that the company produced

household products globally meant that he was doing a service for a lot of people and not just in the United States. Frank explains:

It was right then and there talking about how big this place was, how this is a global company with all the travel opportunities we're going to get and places and things we're gonna be able to do. That really, really have changed my whole mindset...it was a huge opportunity...there's a good chance that most household products...have come through our machines that we make and this is global.

Arya reinforced this relationship between engagement and meaningful work activities. Early in Arya's apprenticeship experience, she was tasked with putting parts in bins to help build one of the company's main product machines. She quickly learned that the company is global and explains, "Ascending products to bins so that they could help build one of our machines...that opened my eyes to how expansive the company is...making that connection...very cool...more a feeling of more purpose here...I felt like...I had purpose here."

Percy's narratives highlight two examples of how meaningful work created the conditions for engagement. Percy explains:

When I was working in the office and I actually go to start buying parts for the company, for our machines, realizing that I was actually contributing to the company and more than just that contributing to the world by helping create machines that produce food...helping the economy out and all of that. That was a huge revelation for me. . . . My mentor brought me to a high school to do a speaking event and he had me speak in front of everybody and I got to tell them about my experiences and it was really neat to see how engaged everybody was when they were hearing about how I was just in their situation a couple of years ago and talking to a group far larger than I've ever spoken to...seeing

everyone's eyes on me, listening to me, watching their faces light up, very emotional. Yeah. They help motivate me to want to become a better apprentice and really make more out of the situation or opportunity I would say that I've been given...being able to enlighten these kids was very amazing...definitely made me more motivated, made me feel like I had more of a purpose in being here rather than like I said earlier, just feeling like I was another number.

Overall, apprentices' engagement with WBL in apprenticeships is shaped by their workplace's ability to afford meaningful work activities. More specifically, engagement was shaped by activities in which apprentices felt like they were having a global impact within their company. Furthermore, meaningful activities were associated with the impact of outcomes. The apprentices showed aspects of engagement when the outcome of their work activities was associated with having an impact on many people. Percy told an additional story about his experience with speaking to high school students about apprentices. When Percy saw the impact, he was having on all the students, he became engaged in the experience and the overall program.

**Workplace relationships.** This study suggests that interactions with mentors, peers, and other workers have a major role in shaping apprentices' engagement in the workplace. Within the category of workplace relationships, the apprentices' relationship with their WBL mentors are the relationships that shape engagement the most. It is a relationship which apprentices take very seriously because it is one that shapes their future in the industry and, most important, engagement in the overall apprenticeship program. Apprentices' collective narrative paints a compelling picture of the grave importance of apprentices' relationship with their WBL mentors. WBL mentors seem to engage apprentices' when they provide more than skills; they seem to engage apprentices when they provide both emotional support and motivation in the workplace.

Rick's narrative highlights that his relationship with WBL mentor is characterized by a strong and robust interpersonal relationship and one in which his WBL mentor provides emotional support. Rick insists that his mentor supports him similar to how a father would support a son and his narrative indicates that the type of emotional support provided to Rick by his mentor, shapes his overall engagement in the program. Rick explains:

You could just come to this individual this mentor that we had. And, you know, he would stop what he was doing in the work day during work, you know, pull you aside. Have a conversation, you know, and just you had that opportunity to be vulnerable and not worry about, you know, someone thinking negatively about you. They were just there to help and support you so that really was kind of like the eye opening of this is, this is something that not everybody gets to experience when you're starting off a career. And at the age that we were at, at that time, you know, as a junior as a senior, you know, 18 19 years old. Fresh out of high school, you know, not knowing what you're doing all the time. You could come to this individual with anything you had and not worry about it. And they would be there to help and support you when you needed that.”

Rick continues to share the impact of his relationship with his WBL mentor:

There were traumatic experiences that happened in my life that my mentor, could you know relate to, for instance, you know, my father had passed away halfway through. And before that, you know, they were interesting family situation things that were going on that were pretty intense. So, you know, my mentor was aware of that and was there just to say, hey, if you ever want to talk you know, let's do that. But I also saw that in the case of others as well when they were going through different issues, but I think it was kind of,

you know, in those moments where things were really going pretty bad for me in my life. That's when you know, he kind of stepped in.

Percy's narrative also demonstrates the importance of having a mentor that increases motivation in the workplace and the mentor's ability to shape engagement throughout the entire apprenticeship experience. Percy's relationship with his mentor started before he was even in the program and explains that: "The mentors actually started pushing me through it too and helping me out, which was very unique, very. I ended up having a very close relationship with my mentor now because of how he helped motivate me through the orientation to make it into the program." As Percy persisted through the program, he developed a deep relationship with his WBL mentor, who has found a way to continue motivating him through the program affording unique opportunities such as visiting local high schools to speak with high school students about apprenticeships:

Our mentor, he likes to take all of us out to different events and whatnot and either speak or just be there. Uh, just keeps us engaged and try to open our experiences a little bit by putting us in these situations. I've been more of an introverted person most of my life. So when it came to speaking to people, I never really felt as if I was really being listened to. And, um, seeing everyone's eyes on me, listening to me, watching their faces light up, very emotional. Yeah. They help motivate me to want to become a better apprentice and really make more out of the situation or opportunity I would say that I've been given.

Percy describes how he views his WBL mentor as more than a workplace guide:

It's more than just a teacher there is that, uh, also, you know, a life guidance counselor or a workplace guidance counselor...he helps us in any situation he can. So, you know, from teaching us how to do things, the making sure we get life things done, save taxes or

payments or all sorts of things. I'm showing up to work on time and being understanding. If, you know, one day we're late and you know, he won't mark us down for it if it's just a one-time thing and he'll, as long as we're learning from it, that's all he really cares about. Yup. So yeah, I would say he's more than just a teacher in that regard...the relationship I have with my peers and my mentor, it really makes me enjoy being here and that alone engages me and what I'm learning.

Though apprentices had unique relationships with their WBL mentors, no matter the nature of the relationship, it still shaped their overall engagement in the program. This is specifically seen this with Rick and Percy whose mentors provided them with emotional support and motivation to persist, respectively, and thus shaped their overall engagement with WBL throughout their apprenticeship experience. It is also important to note that apprentices see their WBL mentors daily and for the duration of the apprenticeship program which is four years. Thus, there is no surprise that their relationship with their mentor has an impact on their overall engagement with the program.

From the literature, there is strong evidence to suggest that engagement is an internal experience that is shaped by external social forces, and in this study, some of those external social forces include relationships with peers. Apprentices suggested that their relationships with peers was another important relationship that shaped their engagement throughout the program. A question that all apprentices had to answer was about the individuals who were involved in their critical incident; most apprentices mentioned that other apprentices were part of the incident in some aspect. Peers' relationships were even stronger and more prominent in their critical incident narratives related to their experiences in related instruction.

Arya, James, and Mike tell narratives that highlight the significance of other apprentices as they affect their engagement with WBL in their apprenticeship. As Arya described her critical incident, other apprentices played a crucial role in her engagement with the apprenticeship. Her narrative shares her thinking about the significance of an apprenticeship and the importance of her relationships. She even suggests that entering an apprenticeship is more beneficial than receiving a scholarship because of the relationships with other apprentices that you are able to build throughout her time as an apprentice: “Being in an apprenticeship is, in my opinion, incredibly beneficial and in my opinion, better than a scholarship because when you're in an apprenticeship with multiple people who are the same age and you go through it together, you build bonds or friendship and bond as coworkers and bond as individuals and it's very healthy to have I think, or emotionally healthy as well.” James and Mike both identified relationships with peers as shaping engaging, but instead of this engagement occurring in the workplace, it occurs in a local community college classroom. James and Mike insist that working with other apprentices enriches his learning experience. James explains, “We help each other out a lot. I don't think either one of us would be doing as well as we are without each other. So that's actually a big thing for me...helping...support... a really good friend and a fellow employee...it's something that is just going to stick with me permanently.” Mike concurs: “Partnership with students that are in the same year of the apprenticeship as you, these are my cohorts that I'm working throughout the whole program...in there with all the same students in every class we have the cohorts from my year, the kids who got into the program, the same time as me, we're all taking the same class together, we help each other a lot. We work through stuff.”

Lastly, apprentices assert that other workers within the workplace shaped their engagement in their WBL experience. This aligns with their narratives about how they develop



their technical skills. Almost all of the apprentices are allowed to rotate throughout their respective facilities and gain new skills. Their WBL mentors specialize in a certain skill; however, they do not specialize in all of the skills that are needed in the entire facility. Therefore, mentors rotate apprentices to other parts of the facility and allow them to learn skills from other workers. Evidence from the study suggests that building relationships with other workers helps them build a sense-of-belonging in the workplace which ultimately shapes their overall engagement with WBL. Chad explains his interactions with one of the workers: “And then there is [name deleted] he works here and he’s been helping with the apprentices for I think 20 years now. So he helps, he comes to checkup, see how you’re welding, he gives you tips on how to do it.”

Rick explains that he even had a relationship with the human resources (HR) director: “You know, in my corner and there to help me and like I said, our HR director has always been in that role as well. So, I was fortunate enough to have three of those individuals that were looking out for my best interest and making sure I was getting the support that I needed.”

**Workplace culture.** Apprentices’ engagement was shaped when they were in workplaces that afforded them positive expectations throughout their experience including those from immediate supervisors and the overall organization. These expectations provided apprentices the ability to work autonomously and shape them into self-directed learners. Apprentices were afforded opportunities that made them feel as if they were traditional employees, which made them work even harder. To the apprentices, having expectations meant that their employers did not view them separate from the company, but expected them to perform like anyone else in the company. These positive expectations are what shaped all aspects of engagement, but highly concentrated in the vigor and absorption aspects of engagement. The

data from the study suggests that affording positive expectations to apprentices invigorates them and absorbs them into the work.

Rick explains that his company has a reputation for having a high standard of welding and, thus, high quality products. As a result, he often is absorbed in his work to ensure he also produces work that aligns with the high standard set by his company. Sampson had a different experience, but an experience in which positive relationships shaped his engagement. Sampson was a first-year apprentice that was afforded the opportunity to work with international engineers and new, multi-million-dollar equipment that had recently been purchased by his company. He perceived those responsibilities as affording trust as he knew that the company expected him to produce similar products to any other employee in the facility. Rick and Sampson's narratives both highlight how positive expectations shaped their engagement with WBL in their apprenticeship. Rick explains:

Something that's very cool about the apprenticeship program is the fact that we're able to learn how to weld the way that that needs to be, uh, weld in a way that, that, um, looks well on the company. This company prided themselves very much on a very high standard of welding. Um, customers come into our site all the time to look at their equipment and are always very, very happy with the weld quality. So, uh, it's very important that the apprentices, you know, learn how to do it the right way. Um, but after just a little bit, a short amount of time, it, it, it often, um, works out that the apprentices weld just so as well, if not better in some cases than some, um, some other welders. So that, that's that kind of a test to, um, the program that we have as well as the commitment we have from the apprentices themselves to push themselves.

Sampson further discusses how his experiences as an apprentice shape his engagement:

Like being in those machines every day and working with the engineers out of Italy and working with the engineers in our plant. Um, it really clicked for me, uh, why these people do what they do. Um, and just the excitement and the suspense of being able to make, you know, big things like that work, big things being those machines and big things being like our company in this industry like this, that's what it's fueled by and it's something that I really enjoy. So whether it's really mediocre tasks like preventative maintenance, one of those machines, um, or a times and we have like really big equipment failures that cost us a lot of money and we've got to fix it very quickly because really literally losing money by the second, um, each one of those things are very enjoyable for me. It's very fulfilling or rewarding.

Sampson elaborates on how his company showed it considered him as part of the team:

Yeah. So I've been kinda gunning to get on the equipment for quite some time and I think there's a lot of, I wouldn't say resistance, but there's a lot of hesitation on part of my higher ups because they hadn't had an apprentice, um, work on that type of equipment. Matter of fact, they hadn't had anyone on that type of equipment, um, from our company cause they never seen anything like that before. So, especially assigning, you know, at the tools to work on it, mess with it. Um, I guess it's kind of scary. So in that moment, the, the equipment broke down. I kind just jumped in and helped how I could and um, [inaudible] just seeing how I handled myself around the equipment, um, really gave them, uh, a lot of pieces being able to assign me to that and trusting those tasks. Um, so since then my role was, the company has looked quite a bit different. I think they've instilled a lot more trust in me since then and as I continue to try and work to prove myself and

continue to try and learn more, um, and more opportunities come and are willing to interest me at work responsibility.

Other apprentices also demonstrated engagement when they were afforded increasing responsibilities and expected to do well with the new responsibilities. As a first-year apprentice, James wanted to work with machines on the floor in his facility. However, his supervisor would not allow him to do so. After a year, he was afforded the opportunity to work with new machines on the floor and exclaimed that “it’s everything that I wanted and everything that I could have asked for...and it was everything I was promised.” Arya also discussed how her employer afforded positive expectations for her to participate in work processes that other full-time employees were participating in: “I’m being trusted with this big process...so, I found myself wanting to do better and doing more than I already was...it changed my perspective and made it more important for me to do better. I feel a drive to do more for myself and for the apprenticeship...I feel more passionate.”

### **Impact of Related Instruction of Overall Apprenticeship Experience**

All but two apprentices’ WBL experience included related instruction (RI). Two of the apprentices involved in this study had only been in their apprenticeship program for 6 months and did not start employment when the school semester began. Thus, they had not started related instruction. However, the rest of the apprentices participated in related instruction at a local community college. The study suggests that when apprentices had positive experiences with related instruction, it increased overall engagement in the program. However, when apprentices had negative or unfavorable experiences during related instruction, it did not shape their engagement in the overall WBL experience.

**Positive RI impact.** Overall, the study highlights that RI increased overall engagement during WBL experiences in apprenticeship programs. All but one apprentice shared a critical incident during RI that increased their overall engagement in their apprenticeship program. Some apprentices reported that their experiences make the overall WBL experience enjoyable, deepened relationships with program stakeholders and peer apprentices, connected classroom and workplace learning, and improved all-around performance.

Apprentices reported building deeper relationships with their peer apprentices during RI. Perhaps, this is because RI instruction is where apprentices report having the most interaction with other apprentices, and they are able to build deeper relationships with other apprentices who are both in their program and also in other programs. RI is an all-day 8 hour experience once a week wherein apprentices from different companies are in the classroom for a similar two-year mechanical engineering degree. During this time, apprentices learn and grow together by attending class and sharing personal workplace experiences with each other. For most of the apprentices, classroom time helps them feel like they have a community within the overall NCTAP. In addition, the interactions with peers help apprentices gain a deeper understanding of the work they are undertaking in the workplace. Some apprentices even report developing lasting friendships with apprentices in the same workplace. Thus, the study shows that these relationships increase engagement by making work more enjoyable and help apprentices persist when they have collective support from others around them. James Hughes explains:

We take all of our classes together. We don't work in the same department at work, but we do take all of our classes together and we help each other out a lot. I don't think either one of us would be doing as well as we are without each other. So that's actually a big thing for me... helping support a really good friend and a fellow employee.

Mike Martin discusses his interactions during RI:

Normally when we're at school, our classes consist of, two-thirds of the students inside the class are kids who are currently inside of the North Carolina Triangle Partnership Program. And then the other third of the students are normally attaining the same degree...but are not in the apprenticeship program. So yes, we have the professor...and then a lot of partnership students that are in the same year of the apprenticeship is you, these are my cohorts that I'm working with throughout the whole program...we're in there with all the same students in every class we have the cohorts from my year the kids who got into the program, the same time as me, we're all taking the same classes together...we help each other a lot...we work through stuff.

Apprentices' critical incident narratives also suggest that RI affords apprentices learning experiences that help them connect classroom and workplace learning, and ultimately improve their technical skills. These two elements afforded by RI increased apprentices' engagement in their overall WBL experience. Apprentices became fully concentrated and engrossed in the overall program when they discovered connections between what they were *learning* in the classroom and what they were *doing* in the workplace. Furthermore, learning in the classroom helped them further cultivate their technical skills, specifically welding and drafting. This increased their motivation for coming to class and work and has made their overall experience more enjoyable.

Sampson, Percy, and Frank all shared narratives that told a clear story of how connections between RI and responsibilities at work shape their engagement in the overall program. Sampson elaborates:

Seeing how much work goes into the design process... it's one thing to look at a picture, but it's another way to really understand the design intent, behind it, all the thought that's put into, the implementation of those designs...that a lot of the things that we work with, a lot of things that we use every day are, they're designed and they're built by just another person...So being able to do that and also being able to use CAD, not just at work, but...doing fabricating on my own time as a hobby and for side work has been really great and really gratifying...I think the outcome would've been a greater understanding of what I do on a daily basis, why I do it and what goes in, what goes into the product that we build and what goes into the design of the equipment that we use to build that product.

Sampson further describes how this increased his engagement in the work:

It encouraged me to kind of push the limits of what I do and also push the limits of what I learned. I think when you have a lesser understanding of equipment like that and of engineering as a whole, it's easy to look at something that's really complicated or hard to understand and just write it off and think that's too complex for me to learn...or too complex for me to understand. But as I said, being able to see through modeling and drafting and design...It pushed me to ask a lot more questions and push me to do a lot more research to try and learn more.

Percy McKeggory discusses how the learning and practice relate for him:

But I can say one thing that is really cool that I've never had before is really being able to take home what I've learned and put it to practical use...occupational safety class... Now that I'm taking that class, I come to work and I can see certain situations and recognize that they're unsafe and be able to make them safer and have a safer working environment or realizing and taking the time before a certain situation even happens to set things up in

a manner that would be even safer than I would've done previously. Or that it comes down to PPE gear or how I'm using a tool or what tools I'm using for the job. Things I've never really considered before now things that I'm really wanting to make sure I incorporate into my work.

Frank Griffin's narrative shows how he views RI:

I'm taking Auto CAD. I love that. You know, it really changed my whole outlook on the whole school aspect of it. And this is real world skills. This is something I'm interested in and I wanted to get really hands on. It makes you may want to give 100%.. I really wasn't happy with the school aspect of it at first... I was having to take classes that felt like I was back in high school or stuff I would never be able to use again... And it just felt like I was doing this for nothing. And then...switch...I got all the more advanced classes for manufacturing, more hands on stuff and this is real world skills that really just changed the whole time and gave me some hope I could actually pull through this...that moment inspired me to keep going and give them 100%... give me hope that can survive it...That's a real potential in the real world.

Overall, RI instruction has an overwhelmingly positive impact on apprentices' engagement with the larger NCTAP experience and enhances engagement as well. RI is a space for apprentices to spend quality time with other apprentices, and thus begin to develop robust and lasting relationships with them on their apprenticeship journey. Apprentices' engagement is also enhanced during RI when the learning in the classroom is directly applicable to the real-life work responsibilities. All but one apprentice expressed positive experiences inside the classroom; however, the apprentice that expressed an unfavorable experience during RI still believed that it enhanced her overall experience in the program.



**Unfavorable experiences.** Arya’s critical incident during RI was unique in that she did not describe her experience during RI as engaging; in fact, she described her experience as the opposite and even “boring.” This is unique because the rest of the apprentices in RI describe it as a “fun” and “engaging” experience where learn material that connects directly to their roles and responsibilities in the workplace. Arya explained that her RI courses were “mundane” and she felt like it was a task that she was required to complete rather than something she enjoys doing. Though her experience with RI was unfavorable, she explicitly stated that her negative view did not impact her overall engagement with her WBL experience. Despite Arya’s experience with RI, she was still able to see the positive attributes and its significance to her overall roles and responsibilities as an apprentice at her company:

But it feels kind of a well, mundane...it's helpful to do and I would be entirely lost if CAD was entirely online. I would be so lost. It would be funny. I do appreciate the class time though, even though it's a little bit boring. I do appreciate it because then we have a chance to meet our teacher and communicate about the actual class and to get help if we need it. So, um, I appreciate it even though it's kind of boring. . . .It didn't really have a negative effect on my attitude towards my apprenticeship that I'm in because I knew it's helping me become more well-rounded individuals and that they're intentionally putting care into training me and my group to be great employees that will benefit the company.

### **Discussion**

The purpose of this study was to investigate the individual and institutional factors shaping apprentices’ engagement in WBL in an apprenticeship context and to determine how their related instruction experience at a local community college shaped their overall engagement in their apprenticeship program.

Most of the narratives shared by apprentices about their critical incident in the workplace are situated at the beginning of their apprenticeship program. Perhaps, the setting of the critical incidents indicate that early engagement is vital to long-term engagement in apprenticeship programs. The study suggests that affordances provided by the workplace shaped apprentices' engagement; some of those affordances include meaningful workplace activities that develop technical and non-technical; positive interpersonal relationships with mentors, peers, and other workers in the facility; and a culture that promotes positive expectations for apprentices. Though the incidents occurred early in the apprentices' apprenticeship journey, the stories are memorable experiences for the apprentices and function as sources of motivation to persist through the apprenticeship program. Furthermore, engaging moments were the memorable moments of which apprentices remembered the setting, actual moment, and impact it had on their lives. The critical incidents in the workplace also suggest a pattern of apprentices being engaged with elements of WBL that were "cool," a term which is highly situated in individual interpretation and looks or feels different to each individual. When apprentices were asked to expand on what "cool" was and why they gravitated to experiences that were "cool," they gave synonyms such as "awesome," "out of this world," "just cool," but were unable to define the word or concept. However, in this study, young apprentices whose ages ranged from 18 to 22, gravitate to experiences that are considered "cool" to them.

The critical incident narratives set in community college classrooms suggested that RI did shape and even enhance engagement in the overall apprenticeship program. The study shows that engagement in RI transfers to overall engagement in the program. The source of engagement in RI stems from positive interpersonal relationships among apprentices in the class, meaningful connections between classroom and workplace learning, and additional support from the

classroom WBL mentor. Additionally, most of the enriching collaborative experiences between apprentices occurred during related instruction at the local community college. This highlights the important role related instruction plays in developing occupational identity and helping cultivate a sense of belonging in the larger NCTAP experience. Though one student reported an unfavorable experience during RI, she remained positive regarding the overall apprenticeship experience and suggested that there was an overall benefit to the class related self-improvement and skill development. Therefore, the experience still enhanced engagement with the overall program.

The literature on factors shaping workplace engagement focuses on individual and institutional factors. The literature suggests that individual factors shaping workplace engagement include existing knowledge, values, occupational identity, meaning behind the work, social constituted personal histories, individual interests, autonomy, flexibility, being included in decision-making, pursuing dynamic involvement in organizational activities, and being treated with fairness and respect (Billett, 2001; 2002; 2004; Burke & Ng, 2006; Shuck & Herd, 2012; Swanwick, 2005). This study highlights many of these factors. The study demonstrates the influence of meaningful or relevant work on engagement as we read about Rick who explained, “We’re reading this stuff in textbooks and then the next day you know you’re on the manufacturing floor and you’re doing what you’re learning about.”

Every apprentice described their interests as working with their hands which increased their engagement with WBL both initially and long-term. Some apprentices even boasted about making the right decision to join the apprenticeship program because it provided flexibility. Another apprentice mentioned that gaining the respect of the other workers in the company was a major influence in him feeling comfortable and wanting to stay in his apprenticeship program.

Apprentices get work experience, earn a four-year degree, and save money, thus allowing them to be flexible in how they move forward in their career in the future.

There are also individual factors in the study that are not highlighted in the literature, including a sense of accomplishment and the stress of debt. Apprentices were invigorated when they were able to “build something” that would be sold or used within the workplace and felt a sense of accomplishment that increased their vigor within the program. Not having college debt also seems to be a major factor of initial and long-term engagement throughout the study as well as a driving factor that influences apprentices’ decisions to enter and stay in an apprenticeship program.

The literature also suggests that several institutional factors shape workplace engagement: supervisors, company culture and expectations, work activities, workplace environment, workplace democracies and cliques, employment status, workplace affiliations, and senior leadership (Billet, 2001, 2002, 2004; Shuck & Herd, 2012). According to Billet, the workplace’s readiness to afford opportunities is a key determinant of individual learning and engagement. Thus, these factors are dependent on how the workplace affords these opportunities to apprentices. Many of the factors highlighted in the literature emerge in the study. The study highlights the importance of support from supervisors or workplace mentors in increasing engagement. Rick is explicit that his workplace mentor “had a huge impact” on his experience in the apprenticeship program. Rick also explains that he became absorbed in his work and committed to quality as he described his company having a culture of pride and being committed to a high standard of welding. The workplace activities that Chad and John were involved in were interesting to them and lead them to enjoy their work. Rick even mentioned that his human resources (HR) director has always supported apprenticeships and though the person didn't have

the official title of mentor, the HR director held a leadership position in the company and influenced the culture in favor of apprentices.

### **Recommendations**

Having an in-depth understanding of these apprentices' experiences with engagement within apprenticeships led to a set of recommendations that can be used by program developers and employers as best practices to improve recruitment strategies and increase engagement which leads to quality learning and improved retention rates.

There are major implications for recruitment strategies. Apprentices in the study talk about financial security being a major driving force for entering apprenticeships. Employers who recruit apprentices must make sure they incorporate the message of financial security, saving money, and being debt-free in the communication to apprentices and their families. It may also be important to impart that being financially free at a young age leads to a more flexible in their career later and being able to achieve some of the things that others cannot such as buying a house, starting a family, or starting a business. It is also be important to communicate that stress in high school may be minimized if students join apprenticeship programs. High school students would not have to stress about passing standardized tests, completing the college application process, or waiting for admissions. Apprentices in the study also revealed that the main support to join apprenticeship is coming from parents, coaches, and teachers. Thus, recruitment efforts should be targeted at introducing apprenticeship programs to spaces where parents, coaches, and teachers will be. These are the individuals who are in students' circle of influence. Lastly, it is important to search for a pool of students who identify as hands-on learners or students who like to work with their hands and build things.

The purpose of apprenticeship programs is to cultivate a skilled workforce and, in the United States, has an important role in replenishing a depleting workforce. Therefore, it is important that apprentices not only persist through the program but are quality and productive workers when they finish the program. Thus, employers could use evidence from this study to improve apprentice engagement. Employers should make sure that each apprentice has a workplace mentor who is fully equipped to provide effective mentoring to the apprentice. Employers should also make sure that they provide a community of practice for apprentices to learn from their peers and other workers within the facility. The study shows that this helps apprentices cultivate a sense of belonging. WBL mentors should not only provide guidance on developing skills, but should also provide career guidance to apprentices, as such guidance was highlighted in the study as being influential to engagement. WBL mentors also need the pedagogical skills to ensure that apprentices learn industry skills and are afforded a quality learning experience. Pedagogical skills are also important because WBL mentors need to know how to connect workplace learning to both related instruction and the broader industry. Lastly, it is important for employers to have a company culture that is supportive of apprentices and one that shows that apprentices are part of a company that produces quality products and has pride in their work.

### **Implications for Future Research**

This study identified individual and institutional factors that shaped apprentice engagement with WBL in an apprenticeship context. The goal of the study was to identify strategies to minimize the factors that decrease engagement and enhance the factors that increase engagement. Ultimately, making these adjustments will improve the learning and development of apprentices. Future research should focus on the relationship between levels of engagement

and the quality of development that occurs in the workplace. It would also be beneficial to track engagement using a longitudinal study and see how long-term engagement shapes retention in apprenticeships and productivity as a full-time employee. It would also be beneficial to conduct an empirical study examining the influence of different engagement strategies and one that empirically examines which factors shape engagement to various degrees. This study also introduced the idea of the factors that shaped early engagement or decisions to enter apprenticeship programs. More quantitative research on early engagement and factors that predict decisions to enter apprenticeships can benefit apprenticeship program developers and recruitment personnel.

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## CHAPTER 5: Conclusion

The purpose of *Examining Mentors and Apprentices in a Workplace Setting: A Three Study Perspective* was to explore the factors that shape the successful implementation of work-based learning (WBL) in apprenticeships. This dissertation was written in response to the growing need for quality workers in the advanced manufacturing industry (AMI) around the country, specifically in North Carolina. Pressures to innovate and sustain a competitive advantage in global markets have forced industries such as AMI to assess their aging workforce: The industry needs younger workers with higher-level skills. A major key to preparing the emerging U.S. workforce is through WBL; more specifically, through WBL programs such as apprenticeships. This dissertation functions as a resource for research and recommendations to improve WBL in apprenticeships and increase the number of young workers with higher-level skills who are ready to be productive in the emerging workforce.

Overall, the dissertation suggests that two main stakeholders, WBL mentors and apprentices, work together to implement WBL and implementation is shaped by two major category of factors, institutional and individual. Furthermore, quality WBL occurs when apprentices are engaged to become productive employees and when WBL mentors perceive their role in a way that leads to actions that align with the critical components of successful WBL in apprenticeships. Figure 5.1 demonstrates the pathway that leads to a skilled workforce based on the logic of the three studies. From study 2, we see that WBL mentors' sensemaking of their roles and responsibilities are shaped by individual and institutional factors, and ultimately shapes their ability to implement quality WBL. From study 3, we see that there are individual and institutional factors that shape apprentice engagement, and ultimately shapes apprentices' ability to implement quality WBL. With high engagement and aligned roles and responsibilities for

WBL mentors, quality WBL results. Lastly, quality WBL results in a skilled workforce in the advanced manufacturing industry (AMI).

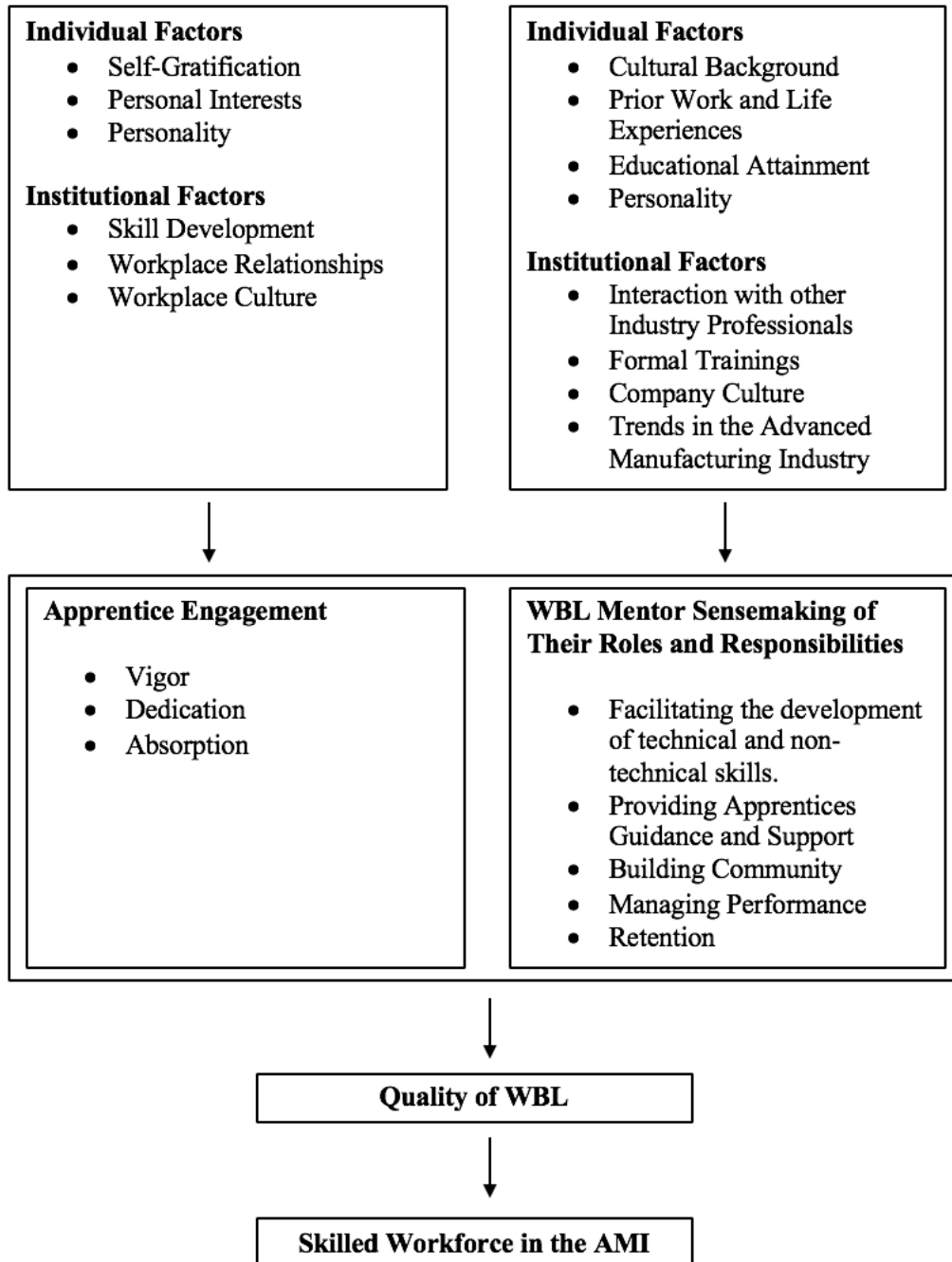


Figure 5.1. Pathway to a Skilled and Prepared Workforce in the AMI.

The first study in Chapter 2 consisted of an integrated literature review that illuminated important insights into the individual factors and institutional factors that shaped WBL in apprenticeships from around the world. These factors were vital in understanding the data that were gathered and analyzed in the two qualitative studies in Chapters 3 and 4. The findings from the literature review led to the exploration of the two main actors, apprentices and WBL mentors, in the implementation of WBL in apprenticeships and frameworks for understanding their role in successfully implementing WBL.

The literature review revealed elements that apprentices bring into the workplace even before the work begins that are factors that the workplace cannot necessarily train for. These elements are known as individual factors and include prior non-technical skills, self-regulation, personal relationships outside of work, and occupational identity. These factors shape apprentices' willingness to engage and ability to focus to learn new technical skills. Ultimately, apprentices are just as responsible for the successful implementation of WBL in apprenticeships as in the workplace. The literature review suggests that it is important for companies to afford apprentices skilled personnel, guidance with autonomy, positive and meaningful work relationships, and a culture of continuous learning. Successful implementation of WBL in apprenticeships is also based on institutional factors, or what the workplace affords to the apprenticeship, specifically the WBL mentor.

The purpose of the second study in Chapter 3 was to describe the interpretations of WBL mentors and investigate the factors that shape those interpretations. This investigation was especially important because empirical studies (Coburn, 2001, 2005; Spillane, Reiser, & Reimer, 2002; Stensaker et al., 2008) suggest that action is based on how people notice or select information from the environment, make meaning of that information, and then act on those



interpretations, developing culture, social structures, and routines. Therefore, exploring how workplace mentors made sense of their role helps researchers understand their routines and actions, and ultimately their implementation of work-based learning in apprenticeships. Individually, the WBL mentors had unique interpretations of the role, but when analyzed as a collective case study, they made sense of their role as being responsible for facilitating skills development, providing guidance, creating a sense of community, managing performance, and retaining apprentices. The study also suggested sociocultural factors that shaped the sensemaking of the WBL mentors in the form of individual and institutional factors. The individual factors included cultural background, prior work and life experiences, educational attainment, and personality. The institutional factors included interaction with other industry professionals, formal trainings, company culture, and trends in the advanced manufacturing industry. These factors shaped the sensemaking, and thus the actions that aligned with successfully implementing the critical components of WBL. Though the roles and responsibilities of workplace mentors are becoming increasingly important, limited research exists regarding their overall experiences (Billett, 2003; Boud & Garrick, 1999; Evan & Rojewski, 1999; Kenny et al., 2015; Porrtman, Illeris, & Nienwenhius, 2011). This study ultimately advances theory and practice related to the selection and preparation of mentors in WBL programs and help mentors become clear about WBL and their role in guiding and implementing the learning strategy in the workplace (Kenny et al., 2015; McIntosh et al., 2014).

The third study in Chapter 4 focuses closely on the experiences of apprentices and their engagement in WBL in apprenticeship programs. The purpose of this study was to describe which individual and institutional factors shaped apprentice engagement during WBL in an apprenticeship context, and to discuss how their experiences with related instruction shaped their

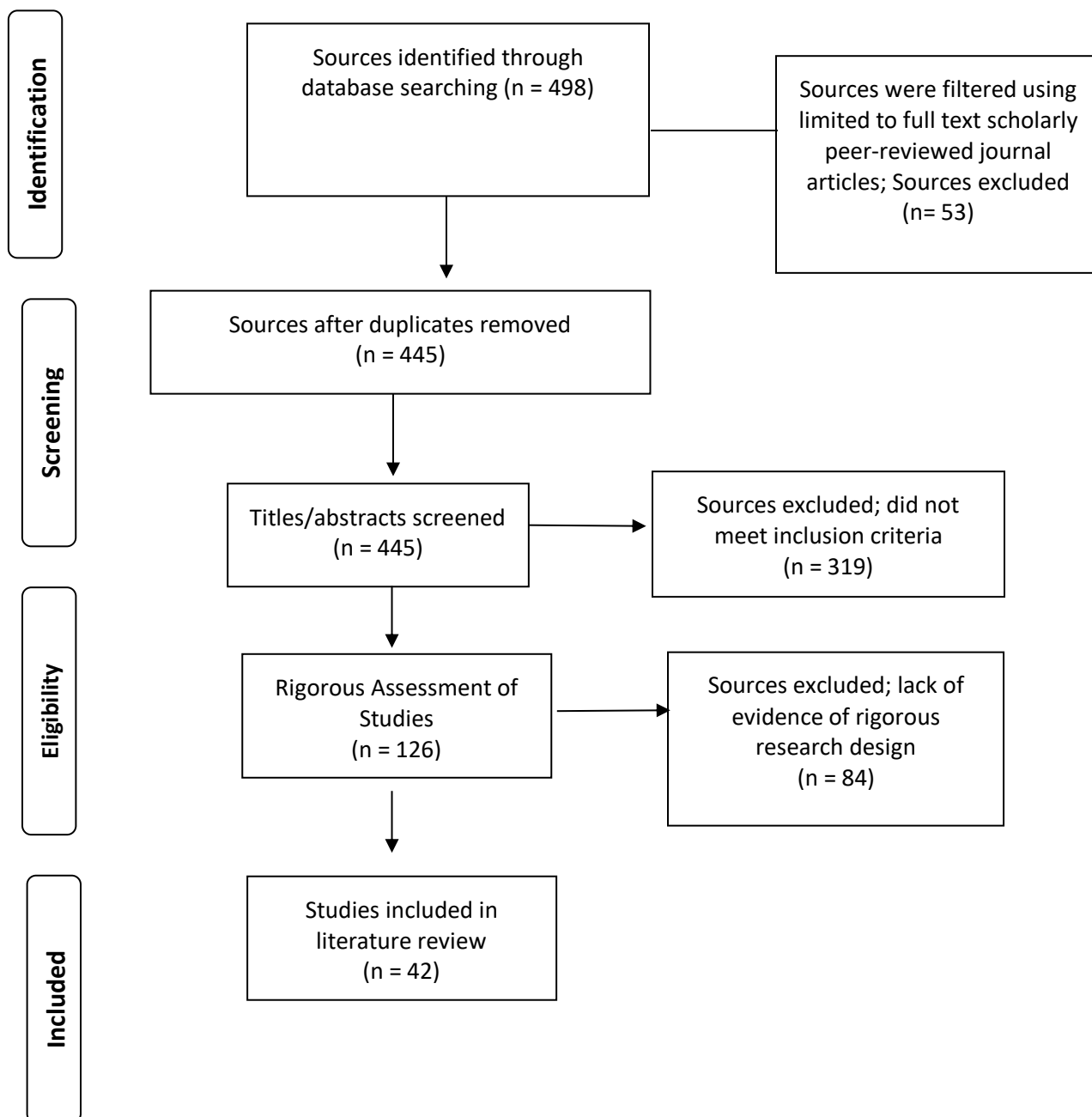
overall engagement in the apprenticeship program. The findings from this study suggested that both individual and institutional factors shaped apprentices' engagement in the program.

Individual factors included self-gratification, personal interest, and personality traits. Institutional factors were related to what the workplace could afford to the apprentices including workplace activities that cultivated skill development, positive workplace relationships, and a culture that promotes learning. The study also revealed that related instruction deepened apprentices' sense of belonging, made work-based learning in the workplace more relevant, increased motivation in overall program, and made the overall program more enjoyable. Ultimately, this study has practical and theoretical implications. Program developers, mentors, and instructors can follow recommendations on how to increase engagement, and human resource departments can use the results to identify and reduce the threats and increase the drivers of engagement for employees. These findings also contribute to a recent, emerging field of study about the phenomenon of workforce engagement (Rich, Lepine, & Crawford, 2010; Saks, 2006; Wefald & Downey, 2009).

Employers have identified a robust talent pipeline and reliable employees who can communicate well, effectively make decisions, and who are interested in long-term careers with the company as factors that will narrow the U.S. skills gap (Richard, 2015). Apprenticeships are a mechanism that can facilitate this much-needed talent pipeline. This dissertation creates a picture of viable path forward as a country that values and facilitates apprenticeships and other WBL opportunities to fill the skills gap. The study is essential for employers who want to design apprenticeship programs because they need to know how to shape WBL mentors' interpretations of their role to align with successful WBL practices. Employers also need to create a culture of a quality learning environment for both mentors and apprentices. The results from these three studies suggest that this combination will lead to the increase of skilled and prepared workers,

specifically in the AMI in North Carolina. Ultimately, when quality WBL occurs, the employers can produce the skilled and prepared workforce that they so desperately need.

**APPENDICES**

**Appendix A: Literature Review Search Strategy**

### Appendix B: Overview of Literature Review Studies

Study	Sample	Country	Method/Data
1. Akkerman & Bakker (2012)	10 apprentices	Netherlands	Qualitative interviews; observations
2. Behrens, Pilz, & Greuling (2008)	Young people at the age of 15	Germany	Quantitative study
3. Brockmann (2013)	Apprentices	England and Germany	Biographical interviews; participant interviews
4. Chan (2017)	Trade Apprentices	New Zealand	Qualitative Interviews
5. Chan (2017)	Baker Apprentices	New Zealand	Longitudinal Study; Qualitative Interviews
6. Chan (2015)	Apprentices	New Zealand	Qualitative Interviews and participant observations
7. Chan (2015)	Apprentices	New Zealand	Qualitative Interviews
8. Chan (2014)	90 apprentices	New Zealand	Qualitative interviews
9. Chan (2013)	13 apprentices	New Zealand	Longitudinal Case Study; Qualitative interviews
10. Caruso & Gurtner (2016)	29 stakeholders from Swiss VET system	Switzerland	Semi-structured interviews
11. Conway & Foskey (2015)	Apprentices	Australia	Qualitative Semi-Structured Interviews
12. Corney & du Plessis (2010)	106 Male apprentices	Australia	Quantitative questionnaire
13. Cortini (2016)	87 apprentices	Italy	Quantitative Survey
14. Duemmler,	25 Retail	Switzerland	Qualitative; observations and focus

Felder, & Caprani (2018)	Apprentices		groups
15. Filliettaz (2011)	40 apprentices	Switzerland	Qualitative observations and audio-video recordings
16. Fjellstrom & Kristmansson (2016)	26 (11 apprentices; 10 students, 5 tutors)	Sweden	Qualitative; interviews and observations
17. Gurtner et al. (2011)	19 Apprentices	Switzerland	Mixed methods audio recordings on mobile devices
18. Hill (2008)	193 apprentices	Australia	Mixed methods; quantitative and qualitative
19. Gow et al. (2008)	326 male apprentices	Australia	Quantitative survey
20. Kenny et al. 2015	12 workplace supervisors	USA	Qualitative interviews
21. Koskela and Palukka (2011)	Stage 1: 9 trainees; 6 trainers  Stage 2: 2 trainees; 4 trainers	Finland	Qualitative observations and video recordings
22. Meredith (2011)	33 employers; 2006 census data	Canada	Mixed methods; interviews and quantitative analysis
23. Messman & Mulder (2015)	70 apprentices	Germany	Quantitative
24. Monks (2010)	24 apprentices	Ireland	Qualitative; questionnaire
25. Nielson (2008)	4 apprentices; 2 journeyman; 1 master, 12 apprentices	Denmark	Qualitative observations and interviews

26. O'Donovan (2018)	10 students	Ireland	Qualitative; in-depth interviews
27. Onnismaa (2008)	27 students	Finland	Qualitative interviews
28. Parkinson, Mackay, & Demecheleer (2018)	36 on-campus trainees; 19 apprentices	New Zealand	Qualitative Interviews; ethnographic analysis
29. Poortman, Illeris, & Nieuwenhuis (2011)	29 respondents; students, teachers, and workplace mentors	Netherlands	Qualitative; semi-structured interviews
30. Pylvas, Nokelainen, & Rintala	40; apprentices, co-workers, trainers, and employers	Finland	Semi-structured interviews
31. Reegard (2015)	11 apprentices, 7 managers	Norway	Qualitative interviews and observations
32. Salzmann, Berweger, & Ark (2018)	497 apprentices	Switzerland	Quantitative; longitudinal survey
33. Sappa & Aprea (2014)	26 vocational school teachers, company trainers and apprentices	Switzerland	Qualitative; semi-structured interviews
34. Smith et al. (2011)	13 "high level stakeholders"	Australia	Qualitative Interviews
35. Stamm (2013)	200 apprentices	Switzerland	Quantitative



36. Taylor & Freeman (2011)	122 survey participants; 19 interview participants	Canada	Mixed Methods; Survey and In-depth interviews
37. Taylor, Hamm, & Raykov (2015)	173 male and female apprentices	Canada	Quantitative Survey
38. Winters et al. (2009)	24 students, 15 teachers, 18 mentors	Netherlands	Qualitative conversations
39. Vaughan (2017)	41 (registrars, carpentry apprentices, and engineering technician cadets)	New Zealand	Qualitative; Observations and semi-structured interviews
40. Virtanen and Tynjala (2008)	531 vocational students	Finland	Quantitative questionnaire
41. Virtanen et al (2014)	1603 vocational students	Finland	Quantitative questionnaire
42. Zhao, Seifried, & Sieweke (2018)	213 Swiss apprentices; 1012 German Apprentices	Switzerland; Germany	Quantitative analysis

**Appendix C: Demographics Information for Workplace Mentors****DEMORGRAPHICS INFORMATION QUESTIONNAIRE**

1. Age?
2. Hometown? (City and State) (City and Country, if not from U.S.)
3. Gender?
4. Marital Status?
5. Income?
6. Race/Ethnicity?
7. Highest level of education?
8. How long have you been in this field?
9. How long have you been employed at this company?
10. How long have you been supervising apprentices?

## Appendix D: Interview with Workplace Mentor

### INTERVIEW GUIDE

Pseudonym:

Interviewer:

Date:

Place:

Scheduled Time:

Start: \_\_\_\_\_ End: \_\_\_\_\_

**Research Topic:** Workplace Mentor Roles and Responsibilities

**Research Question 1:** How do workplace mentors interpret their role in implementing WBL in an apprenticeship program? What factors shape their interpretation? How does this interpretation shape their actions?

**Research Question 2:** What factors do workplace mentors perceive as relevant to their role in successfully implementing WBL in apprenticeships?

#### Questions about Background/Demographics

1. Tell me a little bit about yourself.
  - a. Family background
  - b. Educational experiences after high school.
  - c. Work history over the years and work history related to work-based learning.
  - d. How do you feel about work-based learning? Its role in society? Its role in education?
2. How would you describe your overall experience with work-based learning both personally and professionally?

#### Questions about Research Question 1

3. In your own words, describe work-based learning and your current role in implementing work-based learning?
4. Describe what a successful workplace mentor would look like? What does this mentor do that makes their implementation of work-based learning successful? What results does this mentor yield that makes him or her successful?

5. Could you describe, in as much detail as possible, how you have implemented work-based learning as a workplace mentor?
6. What components of the work-based learning Department of Education framework have you implemented well?
  - a. Alignment of classroom and workplace learning?
  - b. Application of academic, technical, and employability skills in a work setting?
  - c. Support from classroom or workplace mentors?
7. What components do you feel you need to work on?
  - a. Alignment of classroom and workplace learning?
  - b. Application of academic, technical, and employability skills in a work setting?
  - c. Support from classroom or workplace mentors?
8. How did you learn to become a workplace mentor?
9. What type of training did you receive?
10. Describe the training you are receiving now.
11. How have these trainings impacted the way you mentor in the workplace?
12. Were there other sources that helped you develop into a workplace mentor? (Supervisor, literature, videos, trainings, etc.)
13. How have these sources impacted the way you mentor in the workplace?
14. Describe your interaction with other workplace mentors, who also work in apprenticeships. Do you all talk about your roles as mentors?
15. How do these conversations impact the way you mentor in the workplace?

### **Questions about Research Question 2**

16. Earlier in the interview you talked about what the ideal workplace mentor would look like and how the mentor would implement work-based learning in an apprenticeship context. What elements need to be present to ensure work-based learning or on-the-job training is successful?
  - a. Why are these factors important?
  - b. Explain how you implement or ensure these factors are present when you are mentoring in the workplace.
  - c. How does your organization ensure these factors are consistently present?
    - a. If these factors are not present, discuss the reason for their absence.

## Closing the Interview

17. Is there anything else that we have not covered that you would like to add at this time?
  - a. Personal beliefs or philosophies regarding mentoring in the workplace?
  - b. What you most care about, think about?
  - c. Future goals as a workplace mentor?
  - d. How you think the position is evolving with constant technological advances?

*Thank you for sharing your story and participating in this interview!*

The following are probes that will be employed as suggested by Bogdan & Biklen (2003):

What do you mean?  
I'm not sure that I am following you.  
Would you explain that?  
What did you say then?  
What were you thinking at the time?  
Give me an example.  
Tell me about it.  
Take me through the experience.

## Appendix E: Document Collection for Workplace Mentors

### DOCUMENT COLLECTION GUIDE

**Pseudonym:**

**Collector:**

**Date:**

**Source:**

This document will be used by the researcher to ascertain information about Workplace Mentors that the factors that shape their implementation of work-based learning . This includes budget information, policies, annual reports, brochures, mailers and other marketing materials used by the Employer.

**Document Title:** \_\_\_\_\_

**Date Reviewed:** \_\_\_\_\_

**1. Brief summary of document contents**

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**2. Origin of the document (why was it created?)**

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**3. Significance of the document**

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**4. Other sources dealing with this subject**

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_

**5. Corroboration or contradiction of other sources with this document.**

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**Appendix F: Demographics Information Form for Apprentice****DEMORGRAPHICS INFORMATION QUESTIONNAIRE**

1. Age?
2. Hometown? (City and State) (City and Country, if not from U.S.)
3. Gender?
4. Marital Status?
5. Race/Ethnicity?
6. High School Attended?
7. Accepted into 4-year college or university?
8. Highest level of education?
9. Mother's highest level of education?
10. Mother's occupation?
11. Father's highest level of education?
12. Father's occupation?
13. Older siblings' higher level of education? (If any)
14. Political Affiliation?

## Appendix G: Interview with Apprentices

### INTERVIEW GUIDE

Pseudonym:

Place:

Interviewer:

Scheduled Time:

Date:

Start: \_\_\_\_\_ End: \_\_\_\_\_

**Research Topic:** Factors Shaping Apprentices' Engagement in the Workplace

**Research Question 1:** What factors shape apprentice engagement during work-based learning activities in an apprenticeship program?

**Research Question 2:** How do apprentices' experiences during classroom instruction shape apprentices' overall engagement in an apprenticeship program?

#### Questions about Background/Demographics

1. Tell me a little bit about yourself.
  - e. Family background
  - f. Educational experiences during high school?
  - g. What type of student were you?
  - h. Describe how you learn best?

#### Questions about Research Question 1

2. Describe your experience during senior year of high school.
3. How did you prepare for life after high school?
4. Who helped during this preparation? Describe your support system at home and in your community.
5. What resources did you use to prepare for life after high school? (college advisor, parents, online resources, friends, family, etc.)
6. How did you become interested in apprenticeship programs?
7. What did you know about them?
8. What elements of apprenticeship programs attracted you to enter the program?
9. Who helped, if anyone, make your decision to enter an apprenticeship program?
10. Describe your feelings towards entering an apprenticeship, while others took the traditional 4-year route.



## **Critical Incident I - Workplace**

### **Introduction:**

I want to gain a deeper understanding of your experiences in the workplace that have shaped your engagement with your apprenticeship program and therefore, would like you to describe a significant event or moment that occurred while in the workplace.

### **Critical Incident Activity:**

Part I: I want you to reflect upon an event or moment that has occurred in the workplace as an apprentice. You may describe an event or moment that helped you gain a deeper understanding of your work as an apprentice in the advanced manufacturing industry, an event or moment that shaped your attitude toward your work in the apprenticeship, or an event that affirmed your choices and direction of action within the apprenticeship program.

Part II: After you reflect on this moment or event, please verbally describe the event or moment and the impact it has had on your experience in your apprenticeship. The event or moment can be positive or negative. I am not looking for a right or wrong answer, simply an answer that will give me insight about your work-based learning experiences in your apprenticeship. The information provided in this section in addition to the other sections, will be used to describe experiences that shape engagement in apprenticeships during work-based learning activities.

11. Describe your moment or event.
12. Where did the moment or event take place? Describe the setting in detail.
13. Who was involved in the moment or event? Other apprentices? Workplace mentor? Other staff?
14. What led up to the moment or event?
15. What was the outcome of the event or moment?
16. Was the outcome to your satisfaction?
17. What did you learn from this event or moment?
18. What impact did this moment or event have on your overall experience in the apprenticeship?
19. Did the moment or event affirm or change your attitude toward your workplace experience in the apprenticeship?

Critical Incident Activity was adapted from Flanagan, J.C. (1954). The critical incident technique. *Psychology Bulletin*. 51(28), 28-35.

## **Critical Incident II – Related Instruction**

### **Introduction:**

I want to gain a deeper understanding of your experiences in the classroom that have shaped your overall engagement with your apprenticeship program and therefore, would like you to describe a significant event or moment that occurred while in the classroom.

### **Critical Incident Activity:**

Part I: I want you to reflect upon an event or moment that has occurred in the classroom, as an apprentice. You may describe an event or moment that helped you gain a deeper understanding of your work as an apprentice in the advanced manufacturing industry, an event or moment that shaped your attitude toward your overall work in the apprenticeship, or an event or moment that affirmed your choices and direction of action within the apprenticeship program.

Part II: After you reflect on this moment or event, please verbally describe the event or moment and the impact it has had on your overall experience in your apprenticeship. The event or moment can be positive or negative. I am not looking for a right or wrong answer, simply an answer that will give me insight about your classroom experiences in your apprenticeship. The information provided in this section in addition to the other sections, will be used to gain insight on the types of experiences during classroom instruction that shape apprentices' engagement with the overall apprenticeship program.

20. Describe your moment or event.
21. Where did the moment or event take place? Describe the setting in detail.
22. Who was involved in the moment or event? Other apprentices? Classroom instructor? Other staff?
23. What led up to the moment or event?
24. What was the outcome of the event or moment?
25. Was the outcome to your satisfaction?
26. What did you learn from this event or moment?
27. What impact did this moment or event have on your overall experience in the apprenticeship?
28. Did the moment or event affirm or change your attitude toward your overall experience in the apprenticeship?

Critical Incident Activity was adapted from Flanagan, J.C. (1954). The critical incident technique. *Psychology Bulletin*. 51(28), 28-35.

### **Closing the Interview**

29. Is there anything else that we have not covered that you would like to add at this time?
- e. Personal beliefs or philosophies regarding engagement in the workplace?
  - f. Are there things that you want to add that shape your engagement in work-based learning activities?
  - g. How important do you think engagement is and why?

*Thank you for sharing your story and participating in this interview!*

The following are probes that will be employed as suggested by Bogdan & Biklen (2003):

What do you mean?

I'm not sure that I am following you.

Would you explain that?

What did you say then?

What were you thinking at the time?

Give me an example.

Tell me about it.

Take me through the experiences.

**Appendix H: Follow-Up Interview with Apprentice****FOLLOW-UP INTERVIEW GUIDE WITH APPRENTICE**

Pseudonym:

Interviewer:

Date:

Place:

Scheduled Time:

Start: \_\_\_\_\_ End: \_\_\_\_\_

**Prompt:**

Please bring one or more artifacts that represents your attitude toward your apprenticeship. This item can be a photograph, quote, document, collage, item from the workplace, or any visual or textual representation of how you feel about your workplace.

**Interview Questions:**

1. How have you been since the our last interview?
2. What artifact did you bring to this interview?
3. What feelings does it evoke?
4. Describe how this piece is a reflection of your attitude toward your apprenticeship?

### Appendix I: Coding Excerpts

Table 1. WBL Mentors' Sensemaking Code Excerpts

Category	Sub-Category	Definition	Excerpts of Participants Words and Phrases
Skill development	non-technical	Mentors discussing being responsible for the non-technical skill development within apprentices.	"I have to teach them critical thinking skills"
Skill development	technical	Mentors discussing being responsible for technical skill development within apprentices.	"...prepare them achieve a journeyman certificate; to give them skills"
Guidance	workplace success	Mentors explaining that they are responsible for providing guidance related to workplace success.	"I spend time talking about things in the workplace...their goals and visions...students need the guidance as novices in the field...teaching them and guiding them along the way...we are gearing them to work in the manufacturing environment"
Guidance	school success	Mentors explaining that they are responsible for providing guidance related to school success (related instruction in apprenticeship programs).	"But we're up front. What you do need more time off?...you can't come to work today because you have to study for a test tomorrow...that's what we're going to do...school is most important on the front end"
Guidance	Life success	Mentors explaining that they are responsible for providing guidance related to apprentice's personal life.	"I had a gentleman that wrecked the car, got a couple of citations for that, you know, so we had to walk that road with him a little bit"

Community Building	other professionals	Mentors describing their community building efforts within the workplace and facilitating relationships between apprentices and other workers.	“I don’t know everything by any means with what we do here. So I can still rely on other people that are experts in different fields to then take over...that kind of... mentor role...and teaching the apprentice in that field.”
Community Building	mentor-apprentice relationship	Mentors describing their community-building efforts within the workplace and facilitating relationships between apprentices and themselves.	“You have to have the [apprentices] buy-in and you have to build some type of relationship with that person”
Performance Management	Feedback	Mentors describing how they manage the performance of apprentices through feedback strategies.	“No matter where the guys were in their performance aspect, they were meeting every expectation that was ever set for them... We’re communicating what is expected and we’re giving you feedback based upon that inspection”
Performance Management	Monitoring Progress to Completion	Mentors describing how they manage the performance of apprentices through monitoring progress to completion.	“We’ll use a performance improvement plan to go back out, and see what’s causing them not to be able to hit their goals throughout the day.”
Retention	Long-term retention with company	Mentors describing their responsibility of ensuring apprentices stay with the company long-term.	“I definitely think retention. It would be a big part and the apprentices staying with the company after they graduate from the apprenticeship...”

Table 2. Factors Shaping WBL Mentors' Sensemaking Code Excerpts

Category	Sub-Category	Definition	Excerpts of Participants Words and Phrases
Cultural Background	Germany	The mentor's explanation of a German cultural background shapes sensemaking.	"in Germany, apprenticeships are very much part of the culture and a common way to enter the workforce"
Prior Experience	Work Experience	Prior work experience shapes mentor sensemaking within apprenticeship programs.	"I gained knowledge and experience over the years and have passed it down to apprentices."
Prior Experience	Life Experience	Prior life experiences shape mentor sensemaking within apprenticeship programs.	"hard knocks"
Educational Attainment	Beyond High School	Mentors attaining postsecondary degrees shaped sensemaking within apprenticeship programs.	"Two-year plant management diploma"
Personality	Transparent	Being transparent shaped the way mentors made sense of their role.	"open" and "honest"
Personality	Understanding	Being understanding shaped the way mentors made sense of their role.	"servant by nature" and "type B"
Interactions with other industry professionals	Mentors in Workplace	Interacting with other mentors shaped sensemaking within apprenticeship programs.	"Open conversations with other mentors on a regular basis...we typically talk once a week...bouncing things off of each other..."

Interactions with other industry professionals	Mentors in Classroom	Interacting with other mentors in the classroom shaped sensemaking within apprenticeship programs.	“we compare notes.. ‘how is this student doing in your class...this is how he/she is doing’”
Formal Trainings	Leadership	Formal trainings related to leadership competencies shaped sensemaking within apprenticeship programs.	“From Bud to Boss”
Formal Trainings	Mentorship	Formal trainings related to mentorship shaped sensemaking within apprenticeship programs.	“working with youth training from community college; training courses”
Company Culture	Apprenticeship focus	Companies demonstrated a culture that had a focus on apprenticeships.	“viewed as a company as important and meaningful”
Company Culture	Community-centered	Companies demonstrated a focus on being community centered.	“cried together and...prayed together”
Emerging Trends in the Advanced Manufacturing Industry	Industry Standards	Emerging trends related to industry standards were identified.	“prepare them to know what they need to know to work in industry...industry standards...customer perspective...client perspective”
Emerging Trends in the Advanced Manufacturing Industry	Technological Advances	Emerging trends related to technological advances were identified.	“company is investing a lot of money in their tools and all the companies are investing in the latest and greatest”



Emerging Trends in the Advanced Manufacturing Industry	Demographic Shifts	Emerging trends related to demographic shifts were identified.	“the way that millennials and gen Z years learn is completely different from the boomers.”
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Table 3. Factors Shaping Apprentices Engagement in WBL in Apprenticeships

Category	Sub-Category	Definition	Excerpts of Participants Words and Phrases
Self-Gratification	Work outcomes	Evidence of self-gratification related to work outcomes that were associated with completing a task.	“every time I get done on it, I just look back at it. I’m like, wow, that’s, pretty cool. I did that. I built that”
Personal Interest	Nature of the work	Evidence of apprentices having a personal interest in the nature of the work they were participating in.	“I like to work with my hands...I get to work with my hands every single day instead of going to class”
Personality	Optimistic	Apprentices having optimistic personalities.	“It made me realize that I wasn’t going to be stuck...I look at all the positives of the apprenticeship”
Workplace Activities	Technical Skill Development	Apprentices participating in workplace activities that were associated with technical skill development.	“I started welding, that really really changed the way I thought about coming to work”
Workplace Activities	Non-Technical Skill Development	Apprentices participating in workplace activities that were associate with non-technical skill development.	“I learned that I speak up for the stuff that I really wanted...that was a big thing for me...to speak up for myself and learning that I needed to start asking more questions”

Workplace Relationships	WBL mentors	Apprentices describing workplace relationships with WBL mentors.	“But really the mentorship was really what you know solidified the fact that there are people here that truly care about your future and are ready and willing to help you”
Workplace Relationships	Peers	Apprentices describing workplace relationships with peers.	“you build bonds or friendship and bond as coworkers and bond as individuals and it's very healthy to have I think, or emotionally healthy as well.”
Workplace Relationships	Other workers	Apprentices describing workplace relationships with other workers.	“And then there is Bradley Smith, he works here and he's been helping with the apprentices for I think 20 years now. So he helps, he comes to checkup, see how you're welding, he gives you tips on how to do it...”
Workplace Culture	Positive Expectations	Apprentices describing workplace culture that affords positive expectations.	“This company prided themselves very much on a very high standard of welding”

Table 4. Impact of Related Instruction on Overall Experience

Category	Sub-Category	Definition	Excerpts of Participants Words and Phrases
Enhances Overall Experience	Joy	Apprentices describing experiences within related instruction that can be characterized as joyous.	“enjoyed myself”
Enhances Overall Experience	Deepens Relationships with stakeholders	Apprentices describing experiences that deepened relationships	“I don't think either one of us would be doing as well as we are without each other. So that's actually a big thing for me... helping support a

		with stakeholders.	really good friend and a fellow employee.”
Enhances Overall Experience	Connects classroom and workplace learning	Apprentices describing experiences that connected classroom and workplace learning.	“Now that I'm taking that class, I come to work and I can see certain situations and recognize that they're unsafe and be able to make them safer and have a safer working environment”
Enhances Overall Experience	Performance improvement	Apprentices describing experiences that improved their performance in the workplace.	“a better performance overall and ultimately if we did that those things and did well, we were able to gain more money”