

THE ANALYSIS OF QUALITY ESCAPES IN MANUFACTURING PLANTS AND
THE RELATIONSHIPS TO QUALITY WORK STANDARDS

by

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Abstract

The problem explored in this study is inconsistent quality performance across manufacturing plants with quality work standards. As at times, without formal approval, the quality system standard work is abbreviated or circumvented, and quality defects result. Across three organizations, the participants in this study were leaders and employees from four manufacturing plants where variance in standard work execution resulted in personnel error-created customer complaints; as well as, members of one manufacturing plant where consistent standard work execution resulted in zero personnel error-created customer complaints. Qualitative data were collected using a) surveying with an opportunity to provide open-ended commentary, b) observation, and c) interviews concerning the tasks and standard work requirements. The themes that emerged in the literature review were identified in three concepts. The first concept was behavior effects, with the themes of training with accountability value, the impact of behavior, and work processes. Concept two was leadership interaction, with the themes of influence performance, style of approach, and organizational culture. The third concept was employee engagement, with the themes of standard work associated with quality requirements, execution gaps, and performance results. The implications that result from this study were employee performance when consistently executing standard work is influenced by quality-focused manufacturing leadership. The data analysis indicates a positive correlation between quality-focused manufacturing leadership and employee consistency in executing standard work. In addition, training and accountability, as well as organizational culture and employee engagement components of quality-focused manufacturing leadership, show a positive correlation in standard work consistency. Effectively, leadership is the main factor influencing employee standard work consistency.

Keywords: standard work, customer complaints, quality-focused, manufacturing leadership, training, accountability, organizational culture, employee engagement, manufacturing

Dedication

This dissertation is dedicated to Janet Holloway and the late Robert T. Holloway, Sr.

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Table of Contents

Acknowledgments	ii
List of Tables	vi
List of Figures	vii
CHAPTER 1. INTRODUCTION	
Overview	1
Background and Rationale of the Study	3
Statement of the Problem	5
Purpose of the Study	6
Research Questions	7
Nature of the Study	9
Definition of Terms	10
Significance of the Study	27
Assumptions and Limitations	28
Scope of the Study	30
Worldview and Theoretical Foundation	32
Organization of the Remainder of the Study	39
CHAPTER 2. LITERATURE REVIEW	
Overview	40
Questions that Guide the Research	41
Method for Reviewing the Literature	41
Method for Analyzing the Literature	43
Relevant Models, Theories, and Frameworks	45

Organization of Studies According to Themes	49
Synthesis	75
Summary of the Current Status of the Problem in Light of Recent Research	78
CHAPTER 3. METHODOLOGY	
Overview	80
Ethical Considerations	81
Organization of the Remainder of the Chapter	83
Research Questions	84
Research Design	84
Overview of Research Approach Used in this Study	88
Overview of Quality Management Model Used in this Study	90
Population and Sample	93
Selection of Participants	99
Instrumentation	101
Procedures	105
Data Collection	108
Data Analysis	108
Reliability and Validity	112
CHAPTER 4. RESULTS: PRESENTATION AND ANALYSIS OF THE DATA	
Overview	115
Research Findings	118
Synthesis and Summary of Data	150
Contribution to Applied Practice	151

CHAPTER 5. DISCUSSION, IMPLICATIONS, RECOMMENDATIONS

Overview	155
Contribution of the Study	157
Discussion and Implications	160
Recommendations	161

REFERENCES

Appendix A. NIH Training Certificate	195
Appendix B. IRB Review Application Form	196
Appendix C. Participant Disclosure Statement for Research of Data Collection	199
Appendix D. Survey Document	200
Appendix E. Pilot Study Results	202
Appendix F. Research Question One	209
Appendix G. Research Question Two	218
Appendix H. Research Question Three	229
Appendix I. Word Frequency Clouds	238
Appendix J. Hierarchy Charts	247

List of Tables

Table 1.	Synopsis of Sources in the Literature Review	77
Table 2.	Research Population by Participant Category	83
Table 3.	Margin of Error by Participant Category	96
Table 4.	Research Population by Participant Category with Plant Information	97
Table 5.	Research Population Observation and Interview Participants by Category and Plant	98
Table 6.	Survey Pilot Sample Population by Participant Category	100
Table 7.	Survey Pilot Sample Population by Plant and Participant Category	121
Table 8.	Margin of Error by Participant Category at a 95% confidence level	124
Table 9.	Survey Sample Population – Years of Experience with Organization	126
Table E1.	Pilot Study Correlation Results –Research Question One	206
Table E2.	Pilot Study Correlation Results –Research Question Two	207
Table E3.	Pilot Study Correlation Results –Research Question Three	208
Table F1.	Employee Population Research Question One Correlation	210
Table F2.	Leader Population Research Question One Correlation	212
Table G1.	Employee Population Research Question Two Correlation	219
Table G2.	Leader Population Research Question Two Correlation	222
Table H1.	Employee Population Research Question Three Correlation	230
Table H2.	Leader Population Research Question Three Correlation	232

List of Figures

Figure 1. Organization of Studies According to Themes	50
Figure 2. Synthesis of Literature Review	76
Figure 3. Employee Sample Population - Research Question One - Quality-focused Manufacturing Leadership	128
Figure 4. Leader Sample Population - Research Question One - Quality-focused Manufacturing Leadership	129
Figure 5. Employee Sample Population - Research Question Two - Training and Accountability	133
Figure 6. Leader Sample Population - Research Question Two - Training and Accountability	134
Figure 7. Employee Sample Population - Research Question Three - Organizational Culture and Employee Engagement	138
Figure 8. Leader Sample Population - Research Question Three - Organizational Culture and Employee Engagement	139
Figure 9. Word Frequency Cloud Auto Coded - Observations	144
Figure 10. Word Frequency Cloud Auto Coded - Interviews	145
Figure 11. Word Frequency Cloud Manual Coded – Observations and Interviews	146
Figure A. Certificate of Completion NIH	195
Figure E1. Scatterplot Pilot Study Research Question One	203
Figure E2. Scatterplot Pilot Study Research Question Two	204
Figure E3. Scatterplot Pilot Study Research Question Three	205
Figure F1. Research Question One – Employee Population – Years of Experience with Organization	214
Figure F2. Research Question One – Leader Population – Years of Experience with Organization	215
Figure F3. Research Question One – Employee Population – Plant Stage of Development	216

Figure F4. Research Question One – Leader Population – Plant Stage of Development	217
Figure G1. Research Question Two – Employee Population – Years of Experience with Organization	225
Figure G2. Research Question Two – Leader Population – Years of Experience with Organization	226
Figure G3. Research Question Two – Employee Population – Plant Stage of Development	227
Figure G4. Research Question Two – Leader Population – Plant Stage of Development	228
Figure H1. Research Question Three – Employee Population – Years of Experience with Organization	234
Figure H2. Research Question Three – Leader Population – Years of Experience with Organization	235
Figure H3. Research Question Three – Employee Population – Plant Stage of Development	236
Figure H4. Research Question Three – Leader Population – Plant Stage of Development	237
Figure I1. Word Frequency Cloud – Auto Coded Sentiment	239
Figure I2. Word Frequency Cloud – Auto Coded Observations and Interviews (100)	240
Figure I3. Word Frequency Cloud – Manual Coded Observations and Interviews – Low Standard Work Consistency	241
Figure I4. Word Frequency Cloud – Manual Coded High Quality Performance – Medium Standard Work Consistency	242
Figure I5. Word Frequency Cloud – Manual Coded Medium Quality Performance – High Standard Work Consistency	243
Figure I6. Word Frequency Cloud – Manual Coded Observations and Interviews (1000)	244
Figure I7. Word Frequency Cloud – Auto Coded Observations and Interviews (50)	245

Figure I8. Word Frequency Cloud – Auto and Manual Coded Observations and Interviews (1000)	246
Figure J1. Hierarchy Chart – Auto Coded Observations and Interviews	248
Figure J2. Hierarchy Chart – Auto Coded Observations	249
Figure J3. Hierarchy Chart – Auto Coded Interviews	250

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CHAPTER 1. INTRODUCTION

This chapter consists of several sections including the background and rationale of the study, the statement of the problem, the purpose of the study, the research questions, and the nature of the study. Definitions of key terms used in this study are clarified. The significance of the study, assumptions, limitations, and the scope of the study are presented. The worldview and theoretical foundation depict the logical path of research for this study.

Overview

This research explored the causes of inconsistent quality performance across three manufacturing organizations in five plant locations that operated with the same objectives for quality work standard results. These objectives were to ensure error-free supply to customers to facilitate achieving customer loyalty, reducing costs, and improving the performance of the organization. Standard work for quality purposes is developed to, “provide specific instructions on how to perform a task without making mistakes that cause defects” (Feng & Ballard, 2008, table 3). The participating organizations were industry leaders of custom-made products such as electrical components and packaging containers for use across multiple markets such as automotive, food, beverage, personal care, and household. Several locations across the organizations made similar products for the same blue-chip customers. The participating organizations have work instructions detailing the requirements of tasks that need to be performed on a routine basis to reduce the risk of quality defects and ensure customer satisfaction (Manghani, 2011). At times without formal approval, the quality system standard work was abbreviated or circumvented, and a quality defect has resulted.

When deviations from standard work have occurred, customer complaints and non-value-added work have generally resulted. Customer complaints influence customer satisfaction, loyalty, and costs (Paulssen & Catenazzo, 2015). The reason for deviating from the quality standard work requirements was not known, as it was not consistently occurring for each event; however, it had periodically happened across multiple manufacturing locations. It was important to understand the factors causing the inconsistencies in employee performance when executing the quality standard work so measures could be taken to increase customer satisfaction and reduce the cost of poor quality (COPQ) (Duffy, 2013).

Employee performance consists of, “executing defined duties, meeting deadlines, employee competency, and effectiveness and efficiency in doing work” (Iqbal, Anwar, & Haider, 2015, p. 2). Increased understanding of the causes associated with failure to meet expectations has provided knowledge on how to address quality standard work performance gaps within organizations. This qualitative method research contributed to the Quality System Management body of knowledge, as there was a gap in information as to how leadership, training, accountability, organizational culture, and employee engagement factors contributed to employee performance regarding standard work compliance.

The point of view from which this problem was explored was from both the employee and the leadership perspective. The researcher worked to obtain an understanding of how the employees assigned to execute the required quality standard work made decisions to follow the standards or bypass the standards. The understanding of why standard work was not performed as expected provides leadership with the ability to adjust and make continuous improvement changes. These changes target closing the loop on standard work variances.

Background and Rationale of the Study

At times without formal approval, the quality system standard work has been abbreviated or circumvented. When deviations from standard work occurred, customer complaints and non-value-added work have generally resulted. Customer complaints influence customer satisfaction, loyalty, and costs (Paulssen & Catenazzo, 2015). In several manufacturing multi-site companies, recent customer complaints due to variation in executing standard work have resulted in non-value-added costs and defects. The defects included but were not limited to the customer receiving multiple products in a single dedicated product shipment, erroneous products, products with mixed labels, and malfunctioning products. The reason for deviating from the quality standard work requirements was not known, as it was not consistently occurring for each event; however, it had periodically occurred across multiple locations.

“Understanding why people do the things they do on the job is not an easy task for the managers” (Teryima, Alabar, Faajir, Emakwu, & Vivien, 2016, p. 112). Objectives are not attainable without persistent commitments from members of the organization (Bateman & Snell and Dugguh as cited in Teryima et al., 2016). Employee performance can be motivated by effective standards that must be written, understood, and specific as possible (Daft as cited in Teryima et al., 2016).

Standard work is a formal process of documenting the requirements, guidelines, or lists of tasks which employees are required to comply with as part of their routine work assignments (Feng & Ballard, 2008). Standard work instruction describes the requirements to execute specific functions at specific times or in specific situations depending on work activities, expectations, or assignments. Standard work or “routine core tasks are repeatable steps that should be annotated” (Feng & Ballard, 2008, p. 5) as the execution is the expectation of

employee job requirements. The standards of performance are established for the job or task itself regardless of who is performing the tasks (Teryima et al., 2016).

In the participating organizations, specific instructions on how to perform the quality guidelines to ensure mistake and defect free products (Feng & Ballard, 2008), have been created and provided to the manufacturing employees. Adherence to the guidelines, also referred to as standard work, provides demonstrated evidence of success in reducing risks of nonconformance. Even with the evidence of success, employees do not consistently perform the requirements as expected. Gambi, Boer, Gerolamo, Jorgensen, and Carpinetti (2015) have identified one reason for the inconsistencies is that organizations do not appear to be devoted in their adoption of quality techniques which influences performance.

Annually, essential training has been conducted for employees responsible for quality standard work execution. Training, an element of employee engagement, motivates employees not only to perform but also to go beyond job requirements (Balaji, 2014). Work-related training and development are corroborated to be associated with meaningfully higher employee productivity (Halidu, 2015) and improved employee performance (Mpofu & Hlatywayo, 2015). In addition, communication of customer satisfaction associated with zero standard work variance complaints was provided. The knowledge sharing of standard work expectations and customer satisfaction levels was established to convey the need to follow the quality guidelines (Asiedu, 2015), as it has been expressed that employee engagement motivates employees not only to perform but also to go beyond job requirements (Balaji, 2014). However, even with the evidence of customer satisfaction due to standard work consistency, employees did not complete the standard work requirements as expected.

Variation in standard work execution can impact product quality and affect both internal and external customer efficiency and productivity as variability in work processes fosters the likelihood of errors (Feng & Ballard, 2008). These non-conformances in standard work execution lead to variations that increase the cost of poor quality and decrease productivity, customer satisfaction, and competitiveness (Gidey, Beshah, & Kitaw, 2014). It was not understood why quality assurance at several manufacturing plant locations was not consistent across organizations and plants and did not follow the standard work guidelines that were established and communicated.

Quality assurance concerns related to consistently following guidelines necessitates exploration because it had not been examined in certain manufacturing sectors that produce custom commodity-based products for blue-chip customers. The blue-chip customers then supply large retail outlets for direct to consumer purchasing. From a management perspective, understanding why there was a lack of personnel execution to consistent quality assurance was necessary to improve performance within the manufacturing groups. Based on the research from the exploration of these manufacturing groups, the results of this dissertation produced original information to the body of knowledge.

Statement of the Problem

The problem statement for this research was created with assertions utilizing four main components. These components are based on the principal, interacting, speculative proposition and the explicative statement (Jacobs, 2013). The explicative declaration indicates the action taken to resolve the gap identified as the problem.

Quality performance at varying manufacturing plants was inconsistent because the execution of standard work processes varied. Despite instructions on how to perform specific

manufacturing processes that would result in defect-free products (Feng & Ballard, 2008), customer complaints, such as quality, service, and delivery have occurred in multiple organizations and in some cases at multiple sites. The majority of investigated customer complaints were linked to gaps in executing standard work requirements.

Annually, essential training has been conducted for employees responsible for quality standard work execution. In addition, communication of customer satisfaction associated with zero complaints caused by standard work variance has been provided. The knowledge sharing of standard work expectations and customer satisfaction levels were established to convey the need to follow the quality guidelines (Asiedu, 2015), as it has been expressed that employee engagement motivates employees not only to perform but also to go beyond job requirements (Balaji, 2014). However, even with the evidence of customer satisfaction due to standard work consistency, employees did not complete the standard work requirements as expected. Quality assurance concerns related to consistently following guidelines necessitated exploration because not enough examination has transpired in certain manufacturing sectors and may influence customer satisfaction, loyalty, and costs (Paulssen & Catenazzo, 2015).

Purpose of the Study

The purpose of this qualitative case study was to increase understanding of the causes of employees' failure to comply with standard work and to develop a grounded theory to support standard work compliance within manufacturing plants. Work that, when performed consistently, reduces the risk of nonconformance and the cost of poor quality that the organization and customers may experience. Human or personnel error in production was described as standard work error (Ollikainen, & Varis, 2006), or the failure to perform a vital part of the job expectations.

Identified from the literature review, the key personnel variables that impact standard work were leadership, training, accountability, organizational culture, and employee engagement factors. These are factors that contribute to insufficient employee performance regarding standard work compliance. The study was based in the United States of America, and the sample group focused on individuals that had quality standard work as an element of their job requirements. The participants were members of manufacturing plant where variance in standard work execution has resulted in multiple personnel error-created customer complaints; as well as, members of one plant where consistent standard work execution has resulted in zero personnel error-created customer complaints.

Research Questions

Three central research questions that guided this study were:

1. How does quality-focused manufacturing leadership influence employee standard work execution consistency?
2. How does training and accountability influence employee standard work execution consistency?
3. Do organizational culture and employee engagement factors contribute to standard work consistency?

The first research question was related to leadership in each of the manufacturing plants.

1) How does quality-focused manufacturing leadership influence employee standard work execution consistency? This first question was designed to obtain the necessary information in relation to the role leadership has in influencing consistent standard work execution by employees. Leadership in this dissertation also refers to the managers and supervisors of the organizations and plants that participated in the study.

The second research question was related to the level of understanding of employees at each of the manufacturing plants. 2) How does training and accountability influence employee standard work execution consistency? This question was designed to obtain the necessary information in relation to the expectation and role standard work has on consistent employee performance. Training and accountability have been linked in this question. In the organizations associated with the research, individuals must be adequately trained before they are held accountable. Once an individual is trained and their knowledge verified via observation or test, they can be held responsible or accountable for executing job requirements as expected. The accountability expectation is part of the training provided to ensure understanding not only of the necessary standard work but also of the expectations for execution. As such, training and accountability are a combined factor.

The third research question was focused on organizational culture and engagement factors. 3) Do organizational culture and employee engagement factors contribute to standard work consistency? The desired culture of the organizations was for the plants to have a focus on customers satisfaction and organizational success through quality products and employee engagement for high performance results. The question was designed to understand how the culture and employee engagement levels impacted standard work consistency. Culture and employee engagement are linked as employee engagement culture, "starts with an individual taking an action and making it a habit" that results in an adopted behavior that becomes ingrained and expected across the organization as part of the culture (Vragel, 2013, p. 27).

The research questions focused on leadership, as strong leadership styles are essential in motivating employees to perform at their best (Iqbal et al., 2015). The research questions also focused on manufacturing employees, as emotional commitment determines engagement (Kruse,

2012). The questions were determined based on achieving the purpose of the study and identifying the factors that influenced the personnel error or the lack of adherence to quality assurance standards. The questions provided an opportunity to obtain information and insights from the main influencers, namely management and employees, of organizational performance, productivity, customer satisfaction, and financial performance (Teryima et al., 2016).

Nature of the Study

The nature of the study utilized a qualitative method applied to execute the research associated with the dissertation. The qualitative approach was a case study to provide the researcher with the ability to perform in-depth research (Creswell, 2014) on inconsistent quality performance due to standard work process execution gaps. The qualitative case study employed the grounded theory to, "... derive a general, abstract theory of a process...in the views of participants...using multiple stages of data collection" (Creswell, 2014, p. 14).

The research approach was the paradigm worldview of constructivist combined with interpretivism, which concentrates on understanding the connotations that social actions have for the people researched (Zhou, 2012). The research assumptions within this constructivist worldview were epistemology. Epistemology includes human element interpretation through study and field observations (Bunge, 1983). The research assumptions associated with epistemology were the acknowledgment that research is value-laden. Epistemology is, "...what it means to know..." (Scotland, 2012, p. 9) moreover, information gathered beyond the literature research was as close as possible to the source.

As part of the case study, the Social Cognitive Theory of human functioning developed in the 1980s by Albert Bandura (Pajares, 2004) was applied to the dissertation. The social cognitive theory rooted in agentic perspective harmonizes processes such as cognitive, self-

regulatory, and self-reflective in human transformation (Bandura, 2001). As summarized by Pajares (2004) in relation to Bandura's work, "...in an agentic perspective people are self-organizing, proactive, self-reflecting and self-regulating, not just reactive organisms shaped and shepherded by environmental forces or driven by concealed inner impulses" (para.8).

The basic characteristics of qualitative research studies focus on the data collection process. The natural setting (Marshall & Rossman, 2016) characteristic performed for this research was essential as the researcher obtained data in the field at the sites where personnel error or the lack of following the quality standard work occurred. Data were collected from multiple sites and involved: a) surveying with an opportunity to provide open-ended commentary, b) observation, and c) interviews concerning the tasks and standard work requirements. The data triangulation approach on the data sources (Creswell, 2014) was applied by the researcher in relation to the surveys, observations, and interviews. The research produced a grounded theory (Creswell, 2014) based on social structure and human behavior insights.

Definition of Terms

This section clarifies terms utilized in this study. The terms clarified include acronyms, terms that have special meaning, and other common terms that have a particular meaning in the context of this study.

Accountability. Accountability is an obligation or willingness to accept responsibility or to account for one's actions ("Accountability," 2018).

Accuracy. Accuracy, also known as validity, is the amount a measurement or value represents in relation to the actual measurement or value of a reference (Tolentino, Yamashita, De Albuquerque, Walewski, Iwaki, Takeshita, Silva, 2018).

Agentic perspective. As discussed by Bandura (2001), an agentic perspective is humans having the ability to make choices beyond just being reactive (Bandura, 2001).

Alignment. Alignment, as it refers to quality, is the action or actions required to ensure support of the organization's strategy, goals, and objectives ("Alignment," 2018).

American Society for Quality (ASQ). "A professional, not-for-profit association that develops, promotes and applies quality-related information and technology for the private sector, government and academia" ("American Society for Quality," 2018, para. 26).

Assessment. A mathematical review or evaluation of data compared to a standard or criterial (Zaveri, Rula, Maurino, Pietrobon, Lehman, & Auer, 2016).

Audit. The process of collecting evidence that can be verified to be in compliance with a set standard (Maruszewska & Baily as cited by Machado, 2016).

Basic quality concepts. The fundamental ideas and tools for improving quality performance and measuring performance (Dera, 2018).

Best practice. A method or process that improves performance which is recognized by other organizations (Urban, 2018).

Body of knowledge (BoK). The BoK is "the prescribed aggregation of knowledge in a particular area an individual is expected to have mastered to be considered or certified as a practitioner" ("Body of Knowledge," 2018, para. 72).

Bottom line. The fundamental or most important consideration also "the line at the bottom of a financial report that shows the net profit or loss" ("Bottom Line," 2018, para. 73).

Blue Chip Company. According to Haubrich & Dombrosky (1996), the term blue chip company refers to a company that is typically recognized for its record of stability and growth while selling widely accepted products. Companies of this nature are also known to operate profitably in economic downturns.

Case study. Survey, observation, and interview data provide the researcher with the ability to gather data necessary for the research (Mack, Woodsong, MacQueen, Guest, & Namey, 2005).

Capability. Capability is the amount of variation in a stable process; control of variation ensures a capable process in relation to requirements (Gejdoš, 2015).

Cause. "An identified reason for the presence of a defect or problem" ("Cause," 2018, para. 85).

Characteristic. "The factors, elements or measures that define and differentiate a process, function, product, service or other entity" ("Characteristic," 2018, para. 120).

Chart. "A tool for organizing, summarizing and depicting data in graphic form" ("Chart," 2018, para. 121).

Checklist. An instrument for error control used to document the steps or execution order of a process or operation (Baumann, Baumann, Schonig, & Jablonski, 2017).

Coding. Coding is the use of letters, numbers, or symbols assigned to represent another word or meaning ("Coding," 2018).

Common causes. "Causes of variation that are inherent in a process over time" ("Common Causes," 2018, para. 127).

Compliance. The process of meeting or adhering to requirements from contracts, policies, and entities such as government, customer, and certification bodies (Elgammal, Turetken, van den Heuvel, & Papazoglou, 2016).

Confidence level. A confidence level is a statistical statement that expresses the probability that the result cannot be explained by only sampling error ("What Every Researcher," 2008).

Conformance. A product or service that meets the requirements of a specification or expectation ("Conformance," 2018).

Consistency. Harmony to each other or the total, together without conflict or contradiction ("Consistency," 2018).

Constructivist. "Individuals seek understanding of the world in which they live and work" (Creswell, 2014, p. 10).

Consumer. "The external customer to whom a product or service is ultimately delivered; also called end user" ("Consumer," 2018, para. 142).

Continuous improvement (CI). Continuous improvement is an ongoing effort that can result in incremental or breakthrough levels of improvement to product, services, or processes (Gejdoš, 2015).

Corrective action. The process of taking an action to reduce, resolve, or fix a problem that may exist (Stier, 2018).

Correlation (statistical). "Correlation describes the strength of the linear relationship between two observed phenomena" (Velickovic, 2015, p.26).

Cost of poor quality (COPQ) / Cost of quality (COQ). **Cost of poor quality.** The costs associated with not meeting customer expectations or poor quality (Christensen, 2017).

Customer complaint. A customer expresses dissatisfaction towards a provided product or service ("Customer Complaint," 2018).

Customer satisfaction. Customer satisfaction is meeting customer requirements when delivering a product or service ("Customer Satisfaction," 2018).

Data. "A set of collected facts" ("Data," 2018, para. 179).

Data collection and analysis. "The process to determine what data are to be collected, how the data are collected and how the data are to be analyzed" ("Data Collection and Analysis," 2018, para. 180).

Data saturation. Data saturation is reached according to O'Reilly & Parker 2012; Walker 2012 (as cited in Fusch and Ness, 2015) when enough information was obtained to replicate the research study.

Decision making. The act of making a selection that is based on information and analysis when presented with more than one option (Galli, 2018).

Defect. "A product's or service's nonfulfillment of an intended requirement or reasonable expectation for use, including safety considerations" ("Defect," 2018, para. 185).

Defective. "Product that contains one or more defects with respect to the quality characteristic(s) under consideration" ("Defective," 2018, para. 186).

Define, Measure, Analyze, Improve and Control (DMAIC). DMAIC is a data-driven Six Sigma quality, "improvement cycle used for improving, optimizing and stabilizing business processes and designs" (Gejdoš, 2015, p. 566). Six Sigma Define, Measure, Analyze, Improve, and Control (DMAIC) model (Pyzdek & Keller, 2013) was applied to ensure the completion of a cohesive data-driven improvement cycle.

Deviation. The difference of a requirement from the standard requirement ("Deviation," 2018).

Effect. "The result of an action being taken; the expected or predicted impact when an action is to be taken or is proposed" ("Effect," 2018, para. 201).

Effectiveness. "A measure of the appropriateness of the goals chosen and the degree to which they are achieved" ("Effectiveness," 2018, para. 202).

Efficiency. "The ratio of the useful work performed in a process to the total resources required" ("Efficiency," 2018, para. 203).

Efficient. "Achieving maximum productivity with the optimal resources" ("Efficient," 2018, para. 204).

Employee engagement. "Employee engagement is the emotional commitment the employee has to the organization and its goals" (Kruse, 2012, para. 4).

Employee involvement (EI). The process of including the employee in decisions that impact their job and productivity (Alshammari, Al Qaied, Al-Mawali, & Matalqa, 2016).

Employee performance. Employee performance is how well a worker executes expected job-related activities ("Employee Performance," n.d.).

Epistemology Research Assumption. Bunge (1983) presents epistemology studies cognition and its outcome as it makes use of logic and other cognitive sciences. Epistemology is concerned with the nature and forms of knowledge (Cohen, L., Manion, L., & Morrison, K. as cited by Scotland, 2012, p. 9). "Epistemological assumptions are concerned with how knowledge can be created, acquired and communicated, in other words what it means to know" (Scotland, 2012, p. 9).

Ethics. "The practice of applying a code of conduct based on moral principles to day-to-day actions to balance what is fair to individuals or organizations with what is right for society" ("Ethics," 2018, para. 218).

Execution gaps. "The execution gap is a perceived gap between a company's strategies and expectations and its ability to meet those goals and put ideas into action" (Kerr, 2010, para. 1).

Expectations. "The act or state of expecting. To wait in expectation of, or looking forward or anticipating. Also, customers' perceptions about how an organization's products and services will meet their specific needs and requirements" ("Expectations," 2018, para. 222).

External customer. "A person or organization that receives a product, service or information but is not part of the organization supplying it" ("External Customer," 2018, para. 224).

Failure. "The inability of an item, product or service to perform required functions on demand due to one or more defects" ("Failure," 2018, para. 228).

Failure Modes Effect Analysis (FMEA). The process of determining the potential failure modes and effects the failure will have on the process. The process of identifying the known and discovering the unknown of what could potentially go wrong and determining ways to mitigate or eliminate issues (Templin, 2018).

Feedback. "The term feedback can be defined as an interactive process in which the output or effect of an action is returned (fed back) to modify the next action towards reaching a goal (Sedrakyan, 2016, p. 1).

Field observations. "Collecting data and information about a given social setting and situation is often used in preliminary research to have an understanding of the community one is researching" (Smiley, 2015, p. 1).

Function. "A group of related actions contributing to a larger action" ("Function," 2018, para. 249).

Goal. "A broad statement describing a desired future condition or achievement without being specific about how much and when" ("Goal," 2018, para. 261).

Grounded theory. Creswell (2014) indicates grounded theory is based on social structure and human behavior insights grounded in the views of the participants.

Guideline. An instruction that provides information on how to execute a requirement or task ("Guideline," 2018).

Hawthorne effect. A change in behavior due to attention from observation and assessment (Sedgwick & Greenwood, 2015).

Human error (personnel error). Errors caused by humans due to, "non-compliant behaviors caused by ability and motivation, example of ability include insufficient time, inadequate knowledge, skill or experience or procedures that are hard to use or do not reflect the work being performed" (Bridle, 2018, p. 22).

Improvement. "The positive effect of a process change effort" ("Improvement," 2018, para. 284).

Inconsistency. The act of not being aligned, unvarying, or in agreement ("Inconsistency," 2018).

Inputs. "The products, services and material obtained from suppliers to produce the outputs delivered to customers" ("Inputs," 2018, para. 291).

Inspection. "A verification activity. For example, measuring, examining, testing and gauging one or more characteristics of a product or service and comparing the results with specified requirements to determine whether conformity is achieved for each characteristic" ("Inspection," 2018, para. 292).

Institutional Review Board (IRB). A committee that reviews proposed research to ensure humans in research are protected (Edgar & Rothman, 1995).

International Organization for Standardization (ISO). "An independent, nongovernmental international organization with a membership of 161 national standards bodies that unites experts to share knowledge and develop voluntary, consensus-based, market-relevant international standards, guidelines and other types of documents" ("ISO," 2018, para. 310).

Interpretivism. Interpretation and reading the meaning of the actions and language is required by the researcher to understand (Schwandt, 1994).

Interview. The process of interacting by asking questions to obtain information on a specific topic (Castillo-Montoya, 2016).

Inventory. "Inventory is defined as the products within a company's supply and control that are available for sale" ("What is Inventory," 2018, p. 33).

ISO 9000 series standards. "A set of international standards on quality management and quality assurance developed to help organizations effectively document the quality system elements to be implemented to maintain an efficient quality system" ("ISO 9000," 2018, para. 319).

Leader/Leadership. "The action of leading a group of people or an organization, an essential part of a quality improvement effort" ("Leader/Leadership," 2018, para. 343).

Lean. Lean is the process of eliminating non-value-added activities to reduce and eliminate waste while improving operations (Harea, Marian, & Moica, 2017).

Likert scale. A rating system typically used in surveys and questionnaires designed on a scale to measure opinions and perceptions (Jamieson, 2017).

Literature review. "A thematic synthesis of sources used to provide readers with an up-to-date summary of theoretical and empirical findings on a particular topic" (Cisco, 2014, p. 42).

Manager/Management. "An individual with responsibility and authority over managing a process" ("Manager/Management," 2018, para. 362).

Quality-focused manufacturing leadership. For this research, quality-focused manufacturing leadership can be defined as one or a combination the following circumstances: a) individuals in charge, b) individuals responsible for organizational performance, and c) individuals who have people reporting to them (Masood, Dani, Burns, & Backhouse, 2006). Quality-focused manufacturing leadership encompasses top management, middle management, and front-line management.

Margin of error. Margin of error is the largest anticipated difference between the true population and a sample estimate of the true population ("Margin of Error," n.d.).

Matrix. "A document for displaying the relationships among various data sets" ("Matrix," 2018, para. 368).

Measure. "The criteria, metric or means to which a comparison is made with output" ("Measure," 2018, para. 371).

Measurement. "The act or process of determining a value" ("Measurement," 2018, para. 372).

Metric. "A standard for measurement" ("Metric," 2018, para. 376).

Minitab. Version 18 of Minitab (2017) is statistical software used to analyze data.

Multi-site. More than one location or site ("Multisite," 2018).

n. "The number of units in a sample" ("n," 2018, para. 390).

N. "The number of units in a population" ("N," 2018, para. 391).

NIH Office of Extramural Research, Protecting Human as Research Subjects.

National Institutes of Health provided certified training on Protecting Human Research Participants until September 26, 2018 ("National Institutes," n.d.).

Nonconformance/nonconformity. Material that does not meet expectations and may negatively impact the bottom line of an organization if there is a need for rework or destruction (Pintavalle, 2016).

NVivo. Version 12 Plus of NVivo (2018) is qualitative data analysis software.

Objective. "A target or goal to be achieved" ("Objective," 2018, para. 408).

Observations. The action of noticing and documenting a happening or incident that is usually measured (Observations," 2018).

Operations. "Work or steps to transform raw materials to finished product" ("Operations," 2018, para. 413).

Organizational culture. "A common set of values, beliefs, attitudes, perceptions and accepted behaviors shared by individuals within an organization" ("Culture, Organizational," 2018, para. 167).

Out of spec(ification). "A term that indicates a unit does not meet a given requirement or specification" ("Out of Spec," 2018, para. 417).

Outputs. "Products, materials, services or information provided to customers (internal or external) from a process" ("Outputs," 2018, para. 418).

Paradigm Worldview. Constructivist combined with interpretivism model suggests people understand the world around them and develop subjective meaning to the experiences (Creswell, 2014). “Focus is on understanding the meanings that social actions have for the people being studied” (Zhou, 2012, Exhibit 1).

Pareto chart. A quality tool used to sort events by the number of instances to facilitate problem solving of the more significant issues (Barsalou, 2017).

Pearson correlation. The measurement of the relationship between variables of the strength of the linear association ("Pearson Correlation," n.d.).

Personnel error. Errors caused by people/employees within an organization ("Personnel Error," n.d.).

Plan-do-check-act (PDCA) cycle. "A four-step process for quality improvement" ("PDCA," 2018, para. 431). Plan a way to effect improvement. Do is to carry out the plan. Check between what was predicted and what was observed. Act to correct or improve the process.

Probability (statistical). "The likelihood of occurrence of an event, action or item" ("Probability," 2018, para. 441).

Problem solving. The process of seeking answers and solutions to solve problems (Hu, Xiaohui, Shieh, 2017).

Procedure. "A particular way of accomplishing an expected outcome" ("Procedure," 2018, para. 444).

Process. "A set of interrelated work activities that transform inputs into outputs" ("Process," 2018, para. 445).

Process capability. "A statistical measure of the inherent process variability of a given characteristic" ("Process Capability," 2018, para. 448).

Process Failure Mode and Effects Analysis (PFMEA) Methodology. The issues are assessed qualitatively using the process failure and effect analysis (PFMEA) technique and prioritized for further quantitative assessment (Shah, Etienne, Siadat, & Vernadat, 2016).

Process management. A system for managing operations based on performance (Hammer, 2015).

Process owner. "The person who has responsibility and authority for ensuring that a process meets specified requirements and achieves objectives" ("Process Owner," 2018, para. 458).

Productivity. Productivity is the output created from a defined amount of input provided (Ahn, Chettupuzha, Ekyalimpa, Hague, AbouRizk, & Stylios, 2015).

Purposive sampling. Identification and selection of subjects or cases that have abundant information for the efficient use of minimal resources for research (Palinkas, Horwitz, Green, Wisdom, Duan, & Hoagwood, 2015).

Quality. The measure of the level of excellence against a standard or defined requirement (Conole, 2016).

Quality assurance/quality control (QA/QC). "QA is the planned and systematic activities ... to provide confidence that a product or service will fulfill requirements. QC is the operational techniques and activities used to fulfill requirements" ("Quality Assurance/Quality Control," 2018, para. 480). Both interchangeable terms refer to the actions to ensure the quality of a product, service, or process.

Quality escapes. Product or material that is found to be nonconforming after it has been released as acceptable ("Quality Escapes," 2013).

Quality management (QM). Quality management is the application of formalized systems to achieve maximum customer satisfaction at the lowest overall cost to the organization while continuing to improve processes. "Managing activities and resources of an organization to achieve objectives and prevent nonconformances" ("Quality Management," 2018, para. 489).

Quality management system (QMS). "A formal system that documents the structure, processes, roles, responsibilities and procedures required to achieve effective quality management" ("Quality Management System," 2018, para. 490).

Qualitative Method Approach. A qualitative approach utilizing the emergent theme method according to Creswell (2014) provides the researcher the ability to perform the research at the same time and merge the data to provide a comprehensive analysis of the research problems.

Reliability. Reliability is consistency or obtaining roughly the same results every time a specific act is repeated ("Reliability," 2016).

Requirements. A mandatory expectation ("Requirements," 2018).

Results. "Outcomes that can be qualitative or quantitative" ("Results," 2018, para. 519).

Root cause. "A factor that caused a nonconformance and should be addressed with corrective action" ("Root Cause," 2018, para. 524).

Sample. "In acceptance sampling, one or more units of product (or a quantity of material) drawn from a lot for purposes of inspection to reach a decision regarding acceptance of the lot" ("Sample," 2018, para. 531).

Sampling Error. Sampling error is the amount of variation that may exist between the population and sample result ("What Every Researcher," 2008).

Scatter diagram (scatterplot). "A graphical technique to analyze the relationship between two variables. Data are plotted on a graph, with the y-axis for the variable to be predicted and the x-axis for the variable to make the prediction" ("Scatter Diagram," 2018, para. 541).

Scientific management/approach (method). "A term referring to the intent to find and use the best way to perform tasks to improve quality, productivity and efficiency" ("Scientific Management/Approach," 2018, para. 542).

Six Sigma quality. "A term generally used to indicate process capability in terms of process spread measured by standard deviations in a normally distributed process" ("Six Sigma Quality," 2018, para. 561).

Social cognitive theory. The theory developed by Albert Bandura (Pajares, 2004) focuses on human functioning. In the social cognitive view, people are self-regulating and not just reactive to environmental forces (Pajares, 2004).

Specification. "A document that states the requirements to which a given product or service must conform" ("Specification," 2018, para. 570).

Stakeholder. Freeman (as cited by Martinez, Fernandez, and Fernandez, 2016) defined stakeholders as those who can impact or are impacted by decisions and achievement of objectives.

Standard. The document, "...metric, specification, gauge, statement, category, segment, grouping, behavior, event or physical product sample against which the outputs of a process are compared and declared acceptable or unacceptable" ("Standard," 2018, para. 574).

Standardization. "When policies and common procedures are used to manage processes throughout the system" ("Standardization," 2018, para. 577).

Standard work or standardized work. Standard work is "a precise description of each work activity... All jobs are organized around human motion to create an efficient sequence without waste. Work organized in such a way is called standard(ized) work" ("Standard Work," 2018, para. 578). Mann (2010) refers to standard or standardized work as a sequenced work instruction containing a detailed breakdown of the most efficient method to produce a product or perform a task that is necessary to ensure the work is performed uniformly from person to person, location to location, and time to time.

Standard work execution. The process of doing the standard work to get the job done efficiently and with a high level of quality (Dager, 2014).

Standard work instructions. A "tool that enables...understanding of how assembly tasks are to be performed. It ensures the quality level is understood and serves as an excellent training aid, enabling replacement or temporary individuals to easily adapt and perform the assembly operation" ("Standard Work Instructions," 2018, para. 579).

Statistics. "A field that involves tabulating, depicting and describing data sets; a formalized body of techniques characteristically involving attempts to infer the properties of a large collection of data from inspection of a sample of the collection" ("Statistics," 2018, para. 582).

Strategic planning. "The process an organization uses to envision its future and develop the appropriate strategies, goals, objectives and action plans" ("Strategic Planning," 2018, para. 584).

Survey. A survey is a structured or systematic set of data collected in relation to a common set of variables from a sample population (De Vaus, 2016).

System. "A group of interdependent processes and people that together perform a common mission" ("System," 2018, para. 600).

Task. "A specific, definable activity to perform an assigned piece of work, often finished within a certain time" ("Task," 2018, para. 605).

Team. "A group of individuals organized to work together to accomplish a specific objective" ("Team," 2018, para. 606).

Training. The process of enhancing knowledge and skills through sharing for improved performance (Hanaysha, 2016).

Triangulation approach. The act of collecting different types or kinds of data on the same phenomenon and studying these multiple references to improve the correctness of the conclusion (Jick, 1979).

Validity. "The ability of a feedback instrument to measure what it was intended to measure; also, the degree to which inferences derived from measurements are meaningful" ("Validity," 2018, para. 633).

Values. "The fundamental beliefs that drive organizational behavior and decision making" ("Values," 2018, para. 637).

Variation. "A change in data, characteristic or function caused by one of four factors: special causes, common causes, tampering or structural variation" ("Variation," 2018, para. 643).

Vision. "An overarching statement of the way an organization wants to be; an ideal state of being at a future point" ("Vision," 2018, para. 646).

Working sequence. "One...element of standard work; refers to the sequence of operations in a single process that leads a floor worker to most efficiently produce quality goods ("Working Sequence," 2018, para. 654).

Significance of the Study

The material obtained from this qualitative method research contributed to the body of knowledge, as there was a gap in information as to how leadership, training, accountability, organizational culture, and employee engagement factors contributed to insufficient employee performance (Carter, Nesbit, Badham, Parker, & Sung, 2016). The understanding of the contributing factors allows for conclusions and corrective actions to be identified to counter personnel errors or the lack of consistency of following quality assurance guidelines. The overall value of the study ensures continuous improvement possibilities for manufacturing facilities to obtain business objectives (Manghani, 2011) such as gaining customer loyalty, reducing costs, increasing employee involvement, and positively influencing the financial performance of the organization.

The complete adherence to quality standard work across the organization is critical to achieving customer satisfaction and reducing the cost of poor quality. Understanding the element or elements that drive compliance or lack of compliance is essential to correcting the nonconformance. The conceptual theories tied to leadership, training, accountability, organizational culture, employee engagement factors about standard work fulfillment are the basis for the research completed via literature reviews, surveys, observations, and interviews. The research aimed to determine if any or a combination of the factors and elements impacted the standard work implementation.

The participating organizations have confidential and proprietary internal results for quality performance. The results support that following the standard work requirements reduces complaints, improves the cost of poor quality, and meets customer expectations. Also, the knowledge and application of standard work reduce variability, improve costs, "...and deliver customer needs based on quality, reliability and flexibility" (Feng & Ballard, 2008, p. 2). The quality performance ties directly to the customer satisfaction levels and potential growth of the organization (Manghani, 2011). The clear message is quality is essential for customer satisfaction, costs, and continued business growth opportunities (El Khouly & Fadl, 2016). Understanding what themes or elements contributed to inconsistent standard work execution gaps was essential in progressing forward with continuously improving quality.

Assumptions and Limitations

The assumptions in this study were as follows:

- a) Study participants were open and honest with their responses as there were no consequences to any responses, as the study kept identities anonymous.
- b) The reason for the failure to complete or comply with any quality standard work requirements was similar in response regardless of the specific tasks.
- c) The sites were utilizing standard work instructions for specified work that impacted customer quality.
- d) The actual standard work was not relevant if it was related to customer quality.
- e) The individuals performing the required standard work have reviewed the requirements and have experience with executing the requirements.
- f) The research was relevant to any customer-focused manufacturing organization that utilizes standard work.

- g) The Hawthorne effect where individuals modify their behavior in response to their awareness of being observed was not encountered.

The limitations in this study were as follows:

- a) This study was restricted to three manufacturing organizations in five plant locations with two distinct products in similar markets. Organizations with multiple locations were utilizing the same body of knowledge for standard work instructions. All locations had the same standard work execution goals.
- b) This study was limited to four manufacturing plants that had variance in standard work execution which resulted in multiple personnel error-created customer complaints; as well as, one manufacturing plant where consistent standard work execution resulted in zero personnel error-created customer complaints.
- c) The focus was on standard work practices that impacted product quality.
- d) The time frame of the data gathering was limited to 18 weeks.

The mitigation plans for monitoring and minimizing impact to the study were as follows:

- a) Study participants were voluntary, and there were no consequences to any responses as the study kept identities anonymous.
- b) The majority of study participants did not include personal demographic information such as age and gender.
- c) Standard work was utilized at the locations and has a significant impact on customer satisfaction.
- d) The work requirements within the manufacturing organizations catered to customer needs.

- e) If individuals were not familiar with the standard work they were expected to execute, training was highlighted as an area to focus on to the participating organizations.
- f) The requirements for the United States facilities were the same for the global facilities in the organization. As such, the findings were interchangeable throughout the organizations.

Scope of the Study

This qualitative method research study targeted select manufacturing organizations at specific locations. Five manufacturing plant locations from a total of three organizations were involved and selected based on quality performance and the various markets serviced. Four of the five plant locations struggled to execute established standard work consistently. While one of the five plant locations consistently executed established standard work. The scope of this dissertation was limited to standard work that utilized human interaction and directly influenced customer satisfaction. The study was based in the United States of America, and the sample group focus was on individuals that had the standard work as an element of their job requirements.

The participants were members of four manufacturing plants where variance in standard work execution has resulted in multiple personnel errors which have created customer complaints; as well as, members of one manufacturing plant where consistent standard work execution has resulted in zero personnel error-created customer complaints during 2016 through 2018 calendar years. The research was performed and data collected in the 2017 and 2018 calendar years. The specific standard work explored in this dissertation were directly connected to supporting customer product quality requirements. Lack of adherence to any standard work

requirements can influence the cost of poor quality, customer satisfaction, and growth opportunities (El Khouly & Fadl, 2016).

Scholarly research was required to understand possible factors that contributed to the performance opportunities as standard work variation was leading to increased cost of poor quality and customer satisfaction issues. Any nonconformances that were a result of the failure to execute against known guidelines drove inefficiencies into the organizations. These inefficiencies were also being observed by customers who were negatively impacted by quality escapes due to inconsistencies in the execution of the standard work.

The qualitative method research study was conducted in the United States of America in manufacturing sectors that produced custom, high volume, low-cost, commodity-based products for blue-chip customers. Participation was from three organizations using a total of five manufacturing plants that operated with the same objectives for quality work standard results. These objectives were to ensure error-free supply to customers to facilitate achieving customer loyalty, reducing costs, and improving the performance of the organization. Four of the five plant locations had customer complaints associated with variation in the execution of quality standard work requirements. Of these four plants, three were located in Pennsylvania and one was located in Kentucky. The fifth plant located in California had zero complaints associated with standard work as the location had consistent standard work execution. Data collected from these five plants involved: a) surveying with an opportunity to provide open-ended commentary, b) observation, and c) interviews concerning the tasks and standard work requirements.

Two sample populations, employee and leader, were included in the survey, observations, and interviews. The employee sample population consisted of hourly production operators, quality inspectors, and end of line associates responsible for performing the quality standard

work. The leader sample population consisted of salary supervisors, managers, and leaders of the employee sample population. The same tools and data collection instruments have been used for all job classifications; however, 95% of participants were involved in only one of the three data collection methods.

Worldview and Theoretical Foundation

The dissertation utilized the paradigm worldview of constructivist with a qualitative method research design (Creswell, 2014). The research assumptions within this constructivist worldview were epistemology. Epistemology includes human element interpretation through study and field observations (Bunge, 1983). The methodology involved a case study that included surveys, observations, and interviews as well as literature research. The research through the triangulation of data produced a grounded theory based on social structure and human behavior insights.

The constructivist worldview was selected as it best fits the approach that was necessary for this dissertation topic. The topic, Quality Assurance Consistency: Execution Gaps in Manufacturing Plants, explored the leadership, training, accountability, organizational culture, and employee engagement factors that influence performance. The assumptions inherent within the constructivist worldview complemented this research dissertation.

Additional characteristics included epistemology and methodology assumptions. The research assumptions associated with epistemology were the acknowledgment that research is value-laden and information gathered beyond the literature research was as close as possible to the source. There were some field research and observations, which tied directly to the epistemology research assumption. The methodology utilized was a case study approach specifically related to three organizations from a total of five manufacturing plants that operated

with the same objectives for quality work standard results. These objectives were to ensure error-free supply to customers to facilitate achieving customer loyalty, reducing costs, and improving the performance of the organization. Four of the five plant locations had customer complaints associated with variation in the execution of quality standard work requirements. Of these four plants, three were located in Pennsylvania, and one was located in Kentucky. The fifth plant located in California had zero complaints associated with standard work as the location had consistent standard work execution. The participating organizations were industry leaders of custom-made products such as electrical components and packaging containers for use across multiple markets such as automotive, food, beverage, personal care, and household.

As part of the case study, the plan incorporated other data collection tools such as surveys, observations, and interviews. The data triangulation approach on multiple data collection methods (Creswell, 2014) was applied to the surveys, observations, and interviews. Triangulation is a "qualitative research strategy to test validity through the convergence of information from different sources" (Carter, Bryant-Lukosius, DiCenso, Alba, Blythe, & Neville, 2014, p. 545). Triangulation according to Wiersma 2000 (as cited in Oliver-Hoyo & Allen, 2006) is used to compare information from different methods for cross-validation. According to Patton 1999 (as cited in Carter, Bryant-Lukosius, DiCenso, Alba, Blythe, & Neville, 2014) triangulation is the use of multiple data sources to develop a comprehensive understanding of the evidence.

Method triangulation was used in this research study. Method triangulation according to Polit and Beck 2012 (as cited in Carter, Bryant-Lukosius, DiCenso, Alba, Blythe, & Neville, 2014) is the process of using multiple methods of data collection for the same subject. Each data

source was analyzed and then compared to the results of each other to determine where there was agreement and where there was incongruence.

The research through the triangulation of data produced a grounded theory based on social structure and human behavior insights. Grounded theory is executed when a topic has little research documented as is the case for standard work consistency in manufacturing (Ivey, 2017). The grounded theory is developed inductively from data gathered (Flick, 2018). "The design of the research is focused on the research questions, rather than on testing a hypothesis" (Ivey, 2017, p. 288). The core conventions of developing a grounded theory are several. The researcher is to remain objective and avoid preconceived beliefs regarding the subject, subjects, and culture (Ivey, 2017). The formal grounded theory considers the variations in both data and conditions (Flick, 2018).

Denscombe 2014 provided three principles (as cited in Harris, 2015) that distinguish the grounded theory. Principle one is theory construction to describe what is occurring. Principle two is the theory creation based on empirical research without bias focused on fieldwork and real-life data collection. Principle three is parallel and methodical data collection and analysis. Data is used to generate theory and hypotheses to explain the behavior identified in the research per Stern & Porr 2011 (as cited in Ivey, 2017). The outcome is a logical product based on the research.

The history of qualitative research was initiated after World War II by a social movement (Seale, 2004). Social and cultural research was organized in a manner that legitimized the approaches utilized for human inquiry (Seale, 2004). Before World War II, qualitative and quantitative distinctions were not significant or highlighted. Social survey methods led by the United States began to dominate the methodological thinking and practice in human sciences

around the 1950s (Seale, 2004). During this period, the qualitative and quantitative methods became more distinctive, and the qualitative method became an individualized form of research.

The research study took place across three organizations from a total of five manufacturing plants that operated with the same objectives for quality work standard results. These objectives were to ensure error-free supply to customers to facilitate achieving customer loyalty, reducing costs, and improving the performance of the organization. The basic characteristics of qualitative research studies focus on the data collection process. The natural setting characteristic (Marshall & Rossman, 2016) was essential for this research as the researcher obtained data in the field at the sites where the execution of quality standard work occurred. Data were collected from multiple sites and involved: a) surveying with an opportunity to provide open-ended commentary, b) observation, and c) interviews concerning the tasks and standard work requirements.

In this case study, the qualitative research characteristics, researcher as key instrument, and multiple sources of data (Marshall & Rossman, 2016), were used. The researcher for this study collected the data through various means. A data collection plan protocol which is detailed in chapter three Methodology was the means implemented to organize the data collection process. Information obtained from multiple sources of data for example field research, documentation, literature reviews, surveys, observations, and interviews were all gathered by the researcher, in this case, the author of the dissertation.

Inductive and deductive data analysis (Marshall & Rossman, 2016) was utilized to compare and establish a general set of themes. According to Patton (as cited in Marshall & Rossman, 2016), inductive analysis is the process of identifying new patterns, relationships, and themes in the data; whereas, deductive analysis is the process of reviewing existing or

predetermined patterns, relationship, and themes. As part of the inductive data analysis, information collected from the research was reviewed to determine new concepts and perceptions. For the deductive data analysis, the literature research provided various existing notions such as employee engagement, job satisfaction, leadership, and training, as potential contributors to employee standard work variance in manufacturing plants. The data collected from the different sources were reviewed deductively to determine what evidence supported the existing themes until enough additional evidence was collected and reviewed inductively to allow for additional theories or themes.

As the researcher, one must reflect on how personal background, culture, and experiences shaped the interpretations and outcome of the study. This qualitative research characteristic is known as reflexivity (Marshall & Rossman, 2016). The researcher of this qualitative study was a primary influencer of standard work and quality management systems. Effectively, the researcher separated from personal bias and ensured input from the participants was treated without prejudice. Confidential and proprietary results for quality performance in the participating organizations have provided support that following the standard work requirements reduces complaints, improves the cost of poor quality, and improves customer relationships and satisfaction. The quality performance ties directly to customer satisfaction and potential growth of the organization (Manghani, 2011).

The executive leadership team influences the quality culture, which must shift from reactive to proactive. The message is that quality is essential for customer satisfaction, costs, and continued business growth opportunities (El Khouly & Fadl, 2016). Understanding what themes or elements may be contributing to inconsistent standard work execution gaps is essential in progressing forward with continuously improving quality.

Lack of adherence to any standard work requirements can influence the cost of poor quality, customer satisfaction, and growth opportunities. Typically, organizations that have standard work have many documented requirements for use by all levels of the organization. The scope of this dissertation was limited to quality standard work that utilized human interaction and directly influenced customer satisfaction.

All individuals within an organization are responsible for quality and achieving business objectives (Manghani, 2011). Failure to follow critical pieces of the quality standard work can lead to potentially significant upsets in the supply chain. If defects such as erroneous products, products with mixed labels, and malfunctioning products mixed products caused by standard work variances are sent to the customer or end up further down the supply chain potentially to the consumer, potential costs can escalate, customer trust can wane, and reputations can tarnish in the marketplace (Haines & Spreen, 2015).

All participating locations provided training for awareness of the standard work, the execution expectations, and the consequences of not performing. The majority of the standard work activities in the participating organizations were executed without issues or mistakes. However, occasionally the standard work was not adhered to entirely, and elements were omitted during execution. This information has been validated via confidential and proprietary investigations utilizing a failure mode and effects analysis (PFMEA). The root causes of the investigations discovered customer complaints related to human error were related to variances in the standard work execution.

The assumptions inherent within the constructivist worldview complemented this dissertation. The research method included a qualitative method approach and interpretivism, to include the human element and interpretation through study. Additional characteristics included

epistemology and methodology assumptions. The research assumptions associated with epistemology are the acknowledgment that research is value-laden and information gathered beyond the literature research was as close as possible to the source. For this study, there were some field research and observations, which tied directly to the epistemology research assumption.

The conceptual framework explored in this dissertation concentrated on the possible contributors to inconsistent standard work applications. One theory explored was that the quality of training provided impacts the execution of standard work. Employee training can enhance and foster employee engagement significantly (Ahmed, Phulpoto, Umrani, & Abbas, 2015). A second theory studied was that leadership engagement, actions, and interaction sets a tone that drives acceptability and absence of accountability. This lack of attention to the standards implies that it is acceptable to modify or dismiss standard work. It was beneficial to understand the effects of leadership on employee performance and to match the appropriate leadership style to employee performance. The third theory investigated was if employee engagement influences adherence to the standard work requirements. One activity to ensure engagement is to utilize employee involvement when implementing new methods or changes (Souza & Rachid, 2016).

The complete adherence to quality standard work across the organization is critical to achieving customer satisfaction and reducing the cost of poor quality. Also, understanding the element or elements that drive compliance or lack of compliance is essential to correcting the nonconformances. The conceptual theories tied to training, leadership, and employees about standard work fulfillment were the basis for the research completed via literature reviews, surveys, observations, and interviews. The research aimed to determine if any or a combination of the factors and elements impacted the standard work execution.

In summary, this dissertation utilized the paradigm worldview of constructivist with a qualitative method approach. The research assumptions within this constructivist worldview were epistemology and methodology. The epistemology included human element interpretation through study that incorporated observations and field research. The methodology involved a case study that included surveys, observations, and interviews as well as literature research. During this research, a progressive approach was taken intended to produce a grounded theory based on social structure and human behavior insights.

Organization of the Remainder of the Study

Five chapters comprise this study. Chapter one presents the overview, background and rationale, statement of the problem, purpose, research questions, nature of the study, definition of terms, the significance of the study, assumptions, limitations, scope, and worldview. Chapter two is an overview of the literary review, questions that guide the research, methods for reviewing and analyzing the literature, relevant models, theories and frameworks, historical context, emerging themes, and synthesis. Chapter three includes the methodical approach, ethical considerations, chapter organization, research questions, research design, conceptual framework, population and sample, selection of participants, instrumentation, and limitations. Chapter four presents research findings, synthesis, and summary of data and the contribution to applied practice. Chapter five provides an overview, contribution of the study, implications, and recommendations for future research.

CHAPTER 2. LITERATURE REVIEW

Overview

A literature review was performed to identify the historical context of quality assurance standard work execution nonconformities. Standard work is a formal process of documenting the requirements, guidelines, or lists of tasks which employees are required to comply with as part of their normal work assignments (Feng & Ballard, 2008). It was not understood why quality assurance at manufacturing plant locations was not consistent across organizations and plants and did not follow the standard work guidelines that were established and communicated.

Quality assurance concerns related to consistently following guidelines necessitates exploration because it has not been examined in certain manufacturing sectors. The manufacturing sectors are organizations that produce custom, high volume, low-cost products for well-established, stable blue-chip customers. The blue-chip customers then supply large retail outlets for direct to consumer purchasing. The rationale for conducting the literature review was to assess what other subject matter experts have found to support or counter the reasons for understanding why there is a lack of execution to consistent quality assurance. As these quality assurance concerns were explored, the results obtained based on the research of this dissertation produced original information to the body of knowledge.

Despite instructions on how to perform specific manufacturing processes that would result in defect-free products (Feng & Ballard, 2008), recent customer complaints have occurred in multiple organizations and in some cases at multiple sites. Annually, essential training has been conducted for employees responsible for quality standard work execution. In addition, communication of customer satisfaction associated with zero complaints caused by standard work variance has been provided. The knowledge sharing of quality performance and standard

work variation consequences was established as a means to engage and motivate employees to perform and go beyond job requirements (Asiedu, 2015; Balaji, 2014). However, even with the evidence of customer satisfaction due to standard work consistency, employees did not complete the standard work requirements as expected.

Questions that Guide the Research

The central research questions that guide this study were:

- How does quality quality-focused manufacturing leadership influence employee standard work execution consistency?
- How does training and accountability influence employee standard work execution consistency?
- Do organizational culture and employee engagement factors contribute to standard work consistency?

Method for Reviewing the Literature

The literature review analyzed research to understand why there was a lack of execution consistency for quality assurance. Multiple sources were selected from six databases and search engines. The databases and search engines employed for the literature review were ProQuest, OMICS Peer-Reviewed Open Access Journals, Directory of Open Access Journal (DOAJ), Google Scholar, Open Access Theses and Dissertations (OATD), and Google Scholar as well as select journal archival sites such as International Journal for Quality Research (IJQR). The stages of the literature review were executed in sequential order: problem formulation, data collection, data evaluation, analysis and interpretation, and public presentation (Cooper as cited in Randolph, 2009).

The databases and specific journal archival websites were searched using keywords that tied to the research questions associated with the dissertation problem (Creswell, 2014). Using the search engines within the databases, the researcher entered various keywords, phrases, and topic combinations such as standard work, employee engagement, customer satisfaction, leadership, and employee engagement. The list of articles generated from the key search parameters was then funneled down by selecting a time window. The majority of articles searched were from the years 2014 through 2018. The remaining articles within the search parameters were further scrutinized.

The title of an article was reviewed, if it appeared to be relevant to the research questions and themes, the article was opened, and the abstract was reviewed. If the abstract appeared to match the research needs, it was printed, placed in a binder, and an electronic version was saved on the researcher's hard drive. The remaining articles in the search parameter were reviewed by title and abstract until the list was exhausted and all possible articles were printed and electronically saved.

Before the next round of searching for references was initiated, the researcher took the hard copy of each article previously deemed relevant based on the keywords and removed it from the binder. The printed articles were thoroughly read and evaluated, and if the articles were relevant to the topic and research questions, an annotated bibliography was completed. Relevant information from the media item was extracted and logged (Randolph, 2009) in an electronic literature matrix worksheet for ease of referencing and cross-referencing. The worksheet was designed to categorize the articles based on the dissertation questions, published dates, authors, and retrieval dates to provide the ability to search for specific articles efficiently.

Evaluated articles not related or indirectly tied to the topics or research questions were excluded from the process. Articles not directly linked to manufacturing or the manufacturing quality consistency research may have an indirect link to the themes. These articles were included in the research if they added to the value of the study.

The articles that were determined to be significant to the literature research were uploaded in PDF format into Version 79 of Qiqqa (2017) computer software for reference and research management by Quantisle Limited. The software allowed the researcher to type in keywords and obtain all relevant and related articles. It also self-populated the metadata into the database to facilitate article identification and bibliographies. The Qiqqa software facilitated the synthesizing of articles with relevant themes to support the research.

Method for Analyzing the Literature

The method utilized for analyzing the literature was a systematic approach based on the topic, problem statement, and research questions of the dissertation. The research questions were grouped into keywords and themes that tied to the topic and problem statement. The research articles were selected based on how closely the articles relate to the themes. In addition to the themes, the researcher verified that the article was published in a peer-reviewed journal, and the published date was within five years of the projected dissertation completion. In some articles, where the date was outside of the five-year time frame but considered historical, seminal, or impactful to the dissertation the article was included in the research.

From the literature review, the researcher was seeking to understand what others have discovered or identified regarding the problem and research questions. The researcher scrutinized the literature to determine if the problem statement and themes in relation to the particular circumstances had been previously researched and if the dissertation contributed to the

body of knowledge. Also, the researcher identified what articles supported the themes and if the information positively or negatively related to the research topic, problem statement, and research questions. The researcher ensured authenticity, credibility, representativeness, and meaningfulness in the literature source and content (Institute of Lifelong Learning: University of Leicester [Institute Lifelong Learning], 2009).

The best practices for analyzing the literature was to identify what was relevant to the research area, determine the relationship between the study and literature, and effectively use the literature in relation to the research (Punch, 2016). The best practices the researcher identified in association with the literature review were tied to training, leadership styles, and employee engagement. Ensuring the workforce is trained is a best practice that impacts many elements within an organization. As stated, "...employee training can significantly enhance post-training employee engagement" (Ahmed et al., 2015, p. 3). Employee performance is directly tied to leadership, "Leadership impacts significantly on employee performance and participative leadership styles helps to improve performance among employee" (Igbaekemen & Odivwri, 2015, p. 6). For employee engagement, an employee who is connected both intellectually and emotionally with the organization will be more committed and aligned with organizational goals and values (Bhavani, Sharavan, & Arpitha, 2015).

The existing industry standards provided both advantages and disadvantages. From an advantage standpoint, if the standards of quality management systems are adequately established, managed, and followed, the achievement of company objectives is potentially a pathway for success (Manghani, 2011). Examples of quality management standards used to develop successful systems are the international standards established by the International Organization for Standardization (ISO). The industry quality management standards engaged by

manufacturers typically include ISO 9000 and the industry-leading trade institute associated with the specific type of product being produced. Generally, the leading trade institutes do not address specific manufacturing system requirements beyond how to design and measure the specific dimensions and performance characteristics of the product. ISO standards do provide specific guidance on what is expected from a business process and management system ("ISO Quality 9000," 2015). The disadvantages occur when the systems are not developed or communicated effectively as, "Without knowledge and understanding...[it] is impossible to solve the key management system tasks" (Vasilkov & Gushina, 2014, p. 1).

The advantages of the research methodology used to substantiate the claims of the leading models or best practices are the efficiency and usefulness in placing the research into context. It can help in reducing research costs and time. It may provide historical data, be used to disprove or prove a theory or argument, and can offer general background information (Institute Lifelong Learning, 2009). As a second party completes the literature, disadvantages can be potentially associated with the reliability and validity of the literature review (Institute Lifelong Learning, 2009).

Relevant Models, Theories, and Frameworks

A qualitative method approach was applied to execute the research associated with the dissertation. The qualitative approach was a case study to provide the researcher the ability to perform in-depth research (Creswell, 2014) on inconsistent quality performance due to standard work process execution variances. The case study focused on three manufacturing organizations in five plant locations that operated with the same objectives for quality work standard results. These objectives were to ensure error-free supply to customers to facilitate achieving customer loyalty, reducing costs, and improving the performance of the organization. The participating

organizations were industry leaders of custom-made products such as electrical components and packaging containers for use across multiple markets such as automotive, food, beverage, personal care, and household. The organizations produced custom, high volume, low-cost products for well-established, stable blue-chip customers.

The research approach was the paradigm worldview of constructivist combined with interpretivism, which focuses on understanding the meanings that social actions have for the people studied (Zhou, 2012). The research assumptions within this constructivist worldview were epistemology. Epistemology includes human element interpretation through study and field observations (Bunge, 1983). The research assumptions associated with epistemology were the acknowledgment that research is value-laden. Epistemology is, "...what it means to know..." (Scotland, 2012, p. 9) moreover, information gathered beyond the literature research was as close as possible to the source.

The natural setting (Marshall & Rossman, 2016) characteristic performed for this research was essential as the researcher obtained data in the field at the sites where the lack of following the quality standard work occurs. The research produced a grounded theory (Creswell, 2014) based on social structure and human behavior insights. The methodology involved a case study that included surveys, observations, and interviews in addition to literature research. The data triangulation approach on multiple data collection methods (Creswell, 2014) was utilized in relation to the surveys, observations, and interviews.

As part of the case study, the Social Cognitive Theory of human functioning developed in the 1980s by Albert Bandura (Pajares, 2004) was applied to the dissertation. The social cognitive theory rooted in agentic perspective harmonizes processes such as cognitive, self-regulatory, and self-reflective in human transformation (Bandura, 2001). As summarized by

Pajares (2004) in relation to Bandura's work, "...in an agentic perspective people are self-organizing, proactive, self-reflecting and self-regulating, not just reactive organisms shaped and shepherded by environmental forces or driven by concealed inner impulses" (para. 8).

The scope of this dissertation was limited to quality standard work that utilized human interaction and directly influenced customer satisfaction. The type of standard work explored in this dissertation resulted in customer complaints due to variation in execution which resulted in non-value-added costs and defects. The variances were related to personnel errors or decisions to circumvent standard work. Examples of the defects included but were not limited to the customers receiving multiple products in a single dedicated product shipment, erroneous products, products with mixed labels, and malfunctioning products. Customer dissatisfaction, complaints, cost of poor quality, and loss of business resulted from customer complaints associated with standard work variance. The ISO 9000 series framework ("ISO Quality 9000," 2015) was utilized for the documenting and communicating standard work processes.

A Process Failure Mode and Effect Analysis (PFMEA) methodology was employed for customer quality complaints associated with standard work variances. The PFMEA was utilized to analyze the participating organizations confidential and proprietary customer complaints. As part of the PFMEA process, the identified risks from both 2016 and 2017 calendar years were assessed qualitatively using the process failure and effect analysis (PFMEA) technique and prioritized for further quantitative assessment (Shah, Etienne, Siadat, & Vernadat, 2016). The PFMEA reviewed all potential ways for customer complaints to be created. Examples of identified customer complaints were dimensional, fit for use, and visual defects; however, a Pareto analysis clearly showed that most root causes were tied to standard work variation. Samples of standard work variation created errors were mixed ware, mixed labeling, and

incorrect product shipped. As such, this dissertation focused on the events related to the standard work variation.

The Six Sigma's theory, named Define, Measure, Analyze, Improve, and Control (DMAIC) model (Pyzdek & Keller, 2013) was applied to ensure the completion of a cohesively executed project and dissertation. The application of the Six Sigma DMAIC model fit into the stages of the dissertation project. The incorporation of the plan, do, check, and act (PDCA) cycle (Pyzdek & Keller, 2013) ensured the DMAIC steps were completed. The dissertation execution flowed through the DMAIC process. The first phase was to define the problem. The second phase was to measure using literature reviews, surveys, observations, and interviews. The third phase was to analyze the data collected which was followed by making suggestions for potential improvement. Finally, the last phase of DMAIC was to control the message of the results and make suggestions for future research.

The qualitative research method approach was a case study to provide the researcher the ability to perform in-depth research (Creswell, 2014) on the main topic of inconsistent quality performance due to standard work process execution variances. The research approach was the paradigm worldview of constructivist combined with interpretivism, which focuses on understanding the meanings that social actions have for the people studied (Zhou, 2012). The reason for deviating from the quality standard work requirements was not known as there was a gap in information as to how leadership, training, accountability, and organizational culture in relation to employee engagement factors contributed to employee performance regarding standard work compliance.

The understanding of the contributing factors to employee performance regarding standard work compliance allowed for conclusions and corrective actions to be identified to

counter personnel errors or the lack of consistency of following quality assurance guidelines. The overall value of the study ensured continuous improvement possibilities for manufacturing facilities to obtain business objectives (Manghani, 2011) such as gaining customer loyalty, reducing costs, increasing employee involvement, and positively influencing the financial performance of the organization. The research questions were designed to obtain the necessary information about: a) the role leadership has in influencing consistent standard work execution by employees; b) the expectation and role standard work has on consistent employee performance; and c) understand how the culture and employee engagement levels impacted standard work consistency. This research design has resulted in a grounded theory regarding standard work consistency in a manufacturing environment.

Organization of Studies According to Themes

Three concepts emerged in the review of the literature. The first concept was behavior effects, with the themes of training with accountability value, the impact of behavior, and work processes. Concept two was leadership interaction, with the themes of influence performance, style of approach, and organizational culture. The third concept was employee engagement, with the themes of standard work associated with quality requirements, execution gaps, and performance results. The concepts were behavior effects, leadership interaction, and employee engagement. Figure 1 is a synopsis of the topic organization in the literature review or the organization of studies according to the themes of the research.

Figure F1. Organization of Studies According to Themes

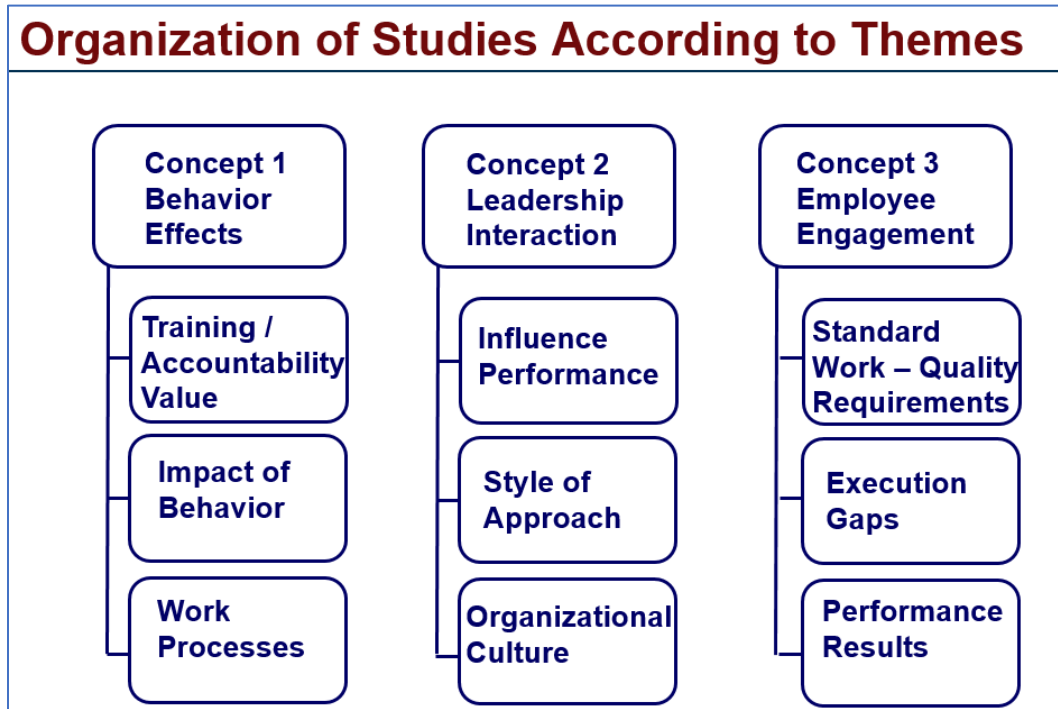


Figure 1. Synopsis of topic organization identified in the literature review. Three concepts emerged which facilitated the development of the research themes.

Behavior Effects Concept

The first concept that emerged from the literature review was behavior effects with the theme topics of training value, impact of behavior, and work processes. Quality assurance concerns related to consistently following guidelines necessitated exploration because it had not been examined in certain manufacturing sectors. Specific instructions on how to perform the quality guidelines to ensure mistake and defect free products (Feng & Ballard, 2008) have been created and provided to employees. Adherence to the guidelines has provided demonstrated evidence of success in reducing nonconformance risk when performed. However, even with the evidence of success, employees did not perform the requirements as expected.

Training and accountability value theme.

The training and accountability value theme was explored as part of the literature review concept topic behavior effects. In the organizations associated with the research, individuals must be adequately trained before they are held accountable. Once an individual is trained and their knowledge verified via observation or test, they can be held responsible or accountable for executing job requirements as expected. The researcher sought to produce a grounded theory based on social structure and human behavior insights. The research study was conducted in multiple manufacturing locations.

The historical view of the training impact was that it plays a significant role in the success of both organizational and employee performance. Historical findings consistently support that job training directly impacts the organization's performance (Halidu, 2015). Based on theories published as early as 1979, targeting employees' interest and creating training components linking psychological capital such as hope, optimism, self-worth, and confidence improves job performance and fosters an environment for job satisfaction, involvement, and commitment (Sahoo, Sia, Sahu, & Appu, 2015).

Quality management systems assurance execution holistically plays a significant role in employee involvement. Ongoing employee training focused on continuous skill enhancements tied to positive organizational results can significantly improve employee engagement (Ahmed et al., 2015). However, time dedicated to training is limited which makes involvement difficult due to the higher level of understanding that may be required for meaningful input (Souza & Rachid, 2016). In addition, a one size fits all training approach is not ideal for a workforce that has multiple generations (Hoole & Bonnema, 2015). Engaging training takes multiple forms including being trainee-centered, entertaining instruction, accommodating learning styles, and

trainee participation through rapport as such engaging trainees utilizing various methods based on learning styles maximizes the learning results (Arghode & Wang, 2016).

Training can improve productivity and work performance. As indicated by Prasad (2016), “training is related to the skills an employee must acquire to improve the probability of achieving the organization’s overall business and academic goals and objectives” (p. 1).

Training and development are effective tools for higher productivity if the correct amount of training is provided for the work performance expected (Halidu, 2015). Training objectives based on current staffing skill and capability gaps through both induction and on the job training show positive investment returns (Halidu, 2015). Interdependent relationship between work-related training and development and employee productivity has been associated with meaningfully higher employee productivity (Halidu, 2015).

From the literature review, multiple sources were identified that support the concept that the training approach has an impact on employee behavior. Diverse approaches based on the needs of the employees (Hoole & Bonnema, 2015) may be necessary to support continuous engagement and productivity. Understanding the why or reason for a process or action helps employees recognize opportunities and react appropriately (Haines & Spreen, 2015). Training transfer is positively influenced by accountability and directly impacts the work performance of both the employee and organization (Ahmed et al., 2015).

Training is the process of improving the talents and capabilities of individuals to perform specific jobs, tasks, and functions (Prasad, 2016). The effectiveness of training programs can be validated via testing on the training content and results such as improved quality metrics (Haines & Spreen, 2015). When training, there is an advantage using action over verbal recall as physical activity may indicate that planning is occurring in one’s mind and facilitates the

working memory performance to enhance knowledge gain (Jaroslawska, Gathercole, Allen, & Holmes, 2016).

In summary and conclusion of the training value, it is evident that training positively affects employee performance, organizational results, employee engagement, and productivity. Accountability positively influences training, which has a significant influence on both the success of the employee and the organization. Training that is meaningful and refreshed can positively influence productivity for an organization. Training that is modified to fit the employee's comprehension ability is the most effective and will provide the best results on performance.

Impact of behavior theme.

The impact of behavior theme was explored as part of the literature review concept topic behavior effects. Employee behavior is altered by various influences ranging from training to relationships. The level and type of engagement have an impact on behavior. The behavior of the employee will have a significant bearing on organizational performance.

The historical view realized from the literature review was engagement and organizational actions impact the behavior of employees and influence job performance and satisfaction. Positive organizational behavior in the form of hope, resilience, optimism, and self-efficacy is directly related to job satisfaction, employee organizational citizenship behavior, and engagement (Pouramini & Fayyazi, 2015). Managing people and their behaviors is critical to obtaining improved performance, and higher productivity as employees are vital factors to an organization's successes (Dagher, Chapa, & Junaid, 2015). Ensuring the right employee behavior fit for the organization will increase performance (John & Chattopadhyay, 2015).

Behavior-based situations can positively influence the outcomes of employee actions. Employee relationships might provide opportunities for increased performance and decreased absenteeism and turnover in employees' behavior (Pouramini & Fayyazi, 2015). Positive organizational behavior influencing job satisfaction can be tied to employee performance and hence overall organizational success and competitiveness (Pouramini & Fayyazi, 2015). Employee satisfaction increases when organizations invest in training, organizations that monetarily invest in training tend to have higher profit margins (Haines & Spreen, 2015). Employees are three times more engaged when leaders communicate with them on a regular basis (Pollock, 2016). Communication that supports employee engagement will, in turn, lead to employee worth; internal communication is a way to express values and goals, and in turn obtain productivity and bottom line results (Karanges, Johnston, Beatson, & Lings, 2015).

Behavior connection to self-worth in relation to employee engagement has been identified in the literature review. As highlighted by Dagher et al. (2015), "the fact that believing in one's own capability to fulfill the requirements of the job successfully is an important factor to increase the level of employee engagement in today's operation" (p. 16). Job involvement measures the degree to which a person identifies their job performance level to their self-worth (Sahoo et al., 2015). Employees with high involvement levels can be associated with the job being relevant to the individual's self-image (Kanungo as cited by Sahoo et al., 2015). Employee engagement is the necessary element in obtaining success and executing sustainable changes in an organization. Employee engagement is when employees are motivated to go beyond job requirements and engagement is developed through training, relationships, reward, and recognition (Piai-Morais, De Souza Orlandi, & De Figueiredo, 2015). Individuals who are

engaged appear to successfully perform the responsibilities of the job and as such the standard work requirements.

In summary and conclusion of the impact of behavior, it is revealed that employee involvement, interaction, and self-worth influence both employee and organizational performance. Behavior can be connected to self-worth and employees with strong perceptions of self-worth are typically engaged with the organization. Managing employees and behaviors is a crucial factor in increased standard work employee engagement and performance.

Work processes theme.

The work processes theme was explored as part of the literature review concept topic behavior effects. Work processes impact behavior and influence results. These work processes include standard work procedures, clear communication, and training. The ISO 9000 series framework is tied to the manufacturing standard work at the focal point of the dissertation. Communication of management decisions and interactions influence employee engagement and execution of the work processes.

A historical view of work practice influence on behavior was evident from the literature review. When employees are engaged psychologically in their occupation, it is characterized as job involvement and becomes part of their daily routine, and as such, life is then related to their job (Reitz & Jewell as cited by Sahoo et al., 2015). Besides, considering employee ideas, following clear communication patterns, and holding employees accountable as they deserve results in the positive modification of employee behavior (John & Chattopadhyay, 2015). As workforce practices influence employee behaviors and outcomes in the work environment (Ahmed et al., 2015), positive interaction is critical.

As part of the sixth quality management principle of the ISO 9000 series, continuous improvement of the quality management system standards, aka work processes, the suppliers and stakeholders should be considered when making decisions ("ISO Quality 9000," 2015).

Employees are stakeholders, and part of the work processes. Control activities should be integrated into the production process as much as possible without additional costs to the operation (Putnik & Avila, 2015). The control activities in many situations are the standard work requirements. Organizations that would benefit from standardization have fewer global or regulatory differences, are global, and have centralized practices (Krivogorsky, Chang, & Black, 2016). The manufacturing organizations in the research study have centralized work processes.

Work processes related to performance and achieving objectives have been explored within the participating organizations. Based on performance results of the manufacturing organizations, it has been demonstrated by internal metrics and customer feedback that adhering to standard work processes drives customer satisfaction, improves performance, and accomplishes cost control. Manufacturing facilities that execute the standard work as expected do not have nonconformities due to personnel error. The manufacturing facilities with nonconformities due to personnel error can trace the root cause of the failure to work processes variance or standard work circumvention.

Developing, training, auditing, and providing feedback are necessary tasks to ensure work processes are effective and properly executed. Affecting behavior change is often a critical part of achieving goals as such the tools and knowledge to influence behavior change need to be part of the process (Horwitz, 2016). Two-way communication is critical and taking an interest in employees is obligatory for sustained employee engagement (Bhavani et al., 2015). Effective

employee training, development systems, and processes are essential to achieving value-added employee performance (Mpofu & Hlatywayo, 2015).

To achieve top quality service and products for improved bottom line results every step and every person in the organization must engage in work quality (El Khouly & Fadl, 2016). In the Thailand plastic industry, the majority of quality defects are from failures to follow standard work (work instructions) due to the lack of documentation, low skill of workers, and misunderstanding of the instructions (Piyachat & Chanongkorn, 2015). These failures are tied to communication, training, and work processes or the lack thereof.

The time factor is a determinant of successful manufacturing ramp-up (Christensen & Rymaszewska, 2016). Ramp-up is the process of increasing production output from zero to full volume production over time (Christensen & Rymaszewska, 2016). The failure to address quality issues during the ramp-up process leads to continuous quality issues that require real-time problem solving also known as firefighting (Christensen & Rymaszewska, 2016). Ensuring work processes are established, clearly communicated, and understood via training and management engagement early in the process increases the likelihood of success.

Work processes have the ability to influence employee behavior. A clear understanding of the current state, employee engagement, and implementing standard work and processes are the key to success (Thong & Lotta, 2015). Management influences the proper implementation of managerial systems, job satisfaction of employees, training, and development (Kapur, 2016). In order to foster employee engagement, leadership must apply employee development support, employee involvement, trust, and fairness, which may prompt the need to enhance the management process (Saratun, 2016). The factors that influence employee retention are highly

correlated with each other; as such, it is imperative to develop, recognize, and empower employees to ensure job satisfaction and retention (Mbayong, 2016).

In summation of work processes, it has been demonstrated that work processes are a means to foster employee engagement and organizational success. Leadership must provide clear communication of work processes as a fundamental part of employee development and engagement. Employee behavior towards achieving goals can be improved upon with proper development, training, and specific standard work.

In summary and conclusion, concept one, behavior effects, has the themes of training and accountability value, the impact of behavior, and work processes. The literature review consistently supports that job training impacts organizational performance. Positively and effectively managing employees and their behaviors delivers performance and increased productivity. Work processes are essential to ensure clear communication and job involvement for employee engagement.

Leadership Interaction Concept

Concept two that emerged from the literature review was leadership interaction with the theme topics of influence performance, style of approach, and organizational culture. The method, approach, and style utilized by quality-focused manufacturing leadership to interact with employees may impact the organization, customer, and employee engagement. Leadership interaction may influence the performance of employees and the effectiveness of work productivity. Leadership interaction overall has a significant impact on the employees that observe, interact, and are affected by the leaders.

Influence performance theme.

The influence performance theme was explored as part of the literature review concept topic leadership interaction. Leadership interaction can positively or negatively influence employee engagement. The method, style, and manner of approach help to define and develop the culture of the organization. The leadership approach can impact employee engagement and organizational performance.

Leadership impact from a historical view was researched in the literature review. The history of leadership and how it affects the performance of employees dates back as early as the 17th century (Carter as cited by Iqbal, Anwar, & Haider, 2015). As the 17th century ended, a noticeable shift began from treating human beings as machines to seeing them as human capital necessary for the achievement of different work tasks (Iqbal et al., 2015). Leaders must possess listening skills, communications skills, develop interpersonal relationships, and exercise trust and dialog (Ejimabo, 2015) with employees to ensure overall success.

Personal coaching, action through feedback, and engagement of leadership peers are essential functions for a value-based culture that requires continuous momentum to sustain the culture (Mash, De Sa, & Christodoulou, 2016). Leadership commitment to quality and change management along with improvements in knowledge and training of all employees is necessary to be successful and in turn should improve attitudes (Alomari, Alshahrani, & Alyami, 2015). Improved attitudes may result in a positive correlation between leadership provided direction and adherence to quality standards (Alomari et al., 2015).

Leadership communication influences employee reception as identified in the literature review. Supervisor communication is related to cognitive and affective components of attitudinal job satisfaction (Winkler, Busch, Clasen, & Vowinkel, 2015). In addition, positive

change in supervisor task-related communication is associated with employee job satisfaction (Winkler et al., 2015). Effective leaders engage with communication and motivation skills and translate these skills into specific behaviors to positively influence change initiatives (John & Chattopadhyay, 2015). Effective leaders who are successful at problem-solving promote open communication, remove silos, put the right people in the right jobs, and have long-term strategies (Greer, 2016).

Current leadership selection may not utilize the most useful tools for finding the most effective leaders as personality should not be the primary factor in the selection decision, but instead, the leadership requirements must be the focus (Carnes, Houghton, & Ellison, 2015). As supervisor behavior directly influences the employee job satisfaction and performance (Winkler et al., 2014), hiring the leader with the best fit for the organization is critical. An employee is more likely to remain with an organization when a leader is attentive to the emotional side of the employee that leads to improved morale and effective two-way communications (Mertel & Brill, 2015).

A leader with a clear vision and concise language improves both the understanding and acceptability from employees. The vision is the vehicle to communicate the core values, objective, and purpose of an organization. Results show that a compelling vision impacts employee satisfaction and performance (Mahmood & Rehman, 2015). Internal communication from the organization and supervisor is an underlying influence of positive employee engagement that results in benefits such as increased productivity, increased financial returns, and employee worth (Kaliannan & Adjovu, 2015).

Leadership interaction can be associated with job satisfaction and influence organizational performance. Employees who can establish strong organizational ties could

maintain strong performance in the organization (Mehmet & Büşra, 2015). Employees experiencing high levels of job satisfaction had a higher commitment to their organization (Mehmet & Büşra, 2015). Stable relationship-oriented behaviors improve outcomes such as work effort and organization commitment, along with positively modifying ‘what will you do for me now’ attitudes from employees (Buch, Martinsen, & Kuvaas, 2015). Employees’ perceptions of corporate engagement and continuous improvement concerning work attitudes and retention are related and have similar effects on the commitment to the organization (Hollingworth & Valentine, 2014).

In summary and conclusion, it can be highlighted that leadership impacts and influences employee engagement and organizational outcomes including financial results. The relationship or interaction between the employees and managers connect to performance and job satisfaction. The interactions of the employees and managers can influence the culture of the organization.

Style of approach theme.

The style of approach theme was explored as part of the literature review concept topic leadership interaction. Employee engagement is guided by the leadership interaction and style of approach. Employee performance is related to the interactions and the environment created in the organization. Employee decisions are impacted by the organizational culture created by the leadership style.

The historical view on leadership style indicated a compelling influence on employees. Effective leadership styles that adapt to the situation are essential in motivating employees to perform at their best (Iqbal et al., 2015). Leadership styles directly influence employee performance and business success (Iqbal et al., 2015). Leadership style has a significant impact

on employee performance, which in turn affects organizational performance (Igbaekemen & Odivwri, 2015).

Leadership behaviors have been identified to have an impact on employee relationships. Leadership style directly influences climate and employee engagement through motivation and execution (Novac & Bratanov, 2014). Results on performance utilizing a telling leadership style versus a selling or participative leadership style show a supportive or participative leadership style climate correlates positively with employee motivation and performance (Novac & Bratanov, 2014).

Laissez-faire leadership is a form of destructive leadership behavior that negatively influences constructive employee outcomes (Buch et al., 2015). The laissez-faire approach tends to avoid interaction with employees; however, for organizational success, leaders must become engaged and responsive to employees (Buch et al., 2015). Destructive micromanaging or the opposite of a laissez-faire approach can also destroy the efficiency and morale of an employee and the organization delivering a negative work environment and results (Sanders & Walters, 2016).

Participative leadership (Democratic) has a positive effect on employee performance as employees feel empowered and confident in making decisions and are useful for the majority of situations (Iqbal et al., 2015). Democratic or participative leadership style is the most suited for both employees and organizational performance (Igbaekemen & Odivwri, 2015). A positive relationship between a manager's adaptive cognitive style and producer, hard-driver, regulator, and monitor leadership types can be found (Hejazi, 2016). However, autocratic or domineering leadership style is useful for short-term periods when rapid change or tasks need to occur (Iqbal et al., 2015).

Leadership decisions have a direct influence on employees. Decision making influences creativity, growth, success, effectiveness, and accomplishment and should link the acceptance of teamwork, diversity, and technology (Ejimabo, 2015). Decision-making is dynamic, challenging, and a continuous process that is important and should consider the general interests of the individuals impacted, and be effective (Ejimabo, 2015).

Leaders value various approaches and styles that may be needed to ensure effectiveness and focus in different situations (Graca & Passos, 2014). Team leadership functions vary across contexts and situations by design to ensure the effectiveness of the team as situational leadership drives the style and values of the leadership to ensure team effectiveness (Graca & Passos, 2014). Leaders need to be involved as decision makers when issues arise, and employees have questions (Buch et al., 2015).

In summary and conclusion of the style of approach, it was noted that leadership interaction has a significant impact on employee engagement and organizational outcomes. Leadership interaction can have both positive and negative influences on employee satisfaction. Decision-making plays a role in employee effectiveness. Leadership style and the manner they approach employees sets the cadence for interactions and outcomes for employee and organizational performance.

Organizational culture theme.

The organizational culture theme was explored as part of the literature review concept topic leadership interaction. Leadership determines culture and the interaction or communication methods deployed with employees. Leaders set the culture while managers drive it to all levels. If the leaders and managers do not believe or support the culture, the employees will not change,

and the organization will remain in its current state. Employees are key elements in ensuring the culture is continuously moving in the desired direction.

The historical view of cultural influence on employees was identified from the literature review. Organizational culture impacts work quality and measurements; as such, correct time allotment and employee participation in decision-making have significant control over work quality (El Khouly & Fadl, 2016). As leadership drives the culture, which drives employee work, quality management must involve employees in decision-making and ensure communications are happening in both directions (El Khouly & Fadl, 2016). Management and leadership drive change in the culture by communicating with employees, being role models, and involving employees in decision making (El Khouly & Fadl, 2016). Quality techniques contribute to performance improvement if they are supported by the existing culture of an organization (Gambi et al., 2015). Culture and employee engagement are linked as employee engagement culture, "starts with an individual taking an action and making it a habit" that results in an adopted behavior that becomes ingrained and expected across the organization as part of the culture (Vragel, 2013, p. 27).

Leadership culture influences the ethics of the organization and employees. It is essential to have ethical leaders in every organization in order to eliminate unethical behavior and positively influence the decisions and actions taken by employees (El Khouly, Mohammad, & El Hady, 2015). Employees will act more ethically if they have an ethical leader who can change employee attitudes by acting as a role model by displaying behaviors of fairness, ethical guidance, integrity, and concern for sustainability (El Khouly, Mohammad, & El Hady, 2015). Employees' behaviors will act in a fashion that reflects the leadership's actions (El Khouly, Mohammad, & El Hady, 2015).

Cultural disorder results in a non-value-based culture with less accountability, integrity, and results (Mash et al., 2016). Within organizations, the concept of motivating employees' interests both managers and employees. Management can motivate employees by extrinsic rewards such as monetary benefits and work conditions as well as intrinsic rewards which provide acknowledgment of success and achievement (Sev, Alabar, Avanenge, Emakwu, & Ugba, 2016). The most efficient state of performance and efficiency of the organization is achieved when there is an alignment of the resources, the least amount of organizational friction, and customer requirements are achieved (Horne, 2016).

Organizational culture influences the productivity and results of organizations and employees. Following a systematic approach through incremental initiatives to create a culture of productivity and collaboration is necessary for positive change (Thong & Lotta, 2015). The integration between technical and social elements can improve performance more efficiently than if they are introduced separately (Gambi et al., 2015). The first step in transforming organizational culture is a successful quality system that aligns with desired values and results (Mash et al., 2016). Organizational value-based culture is possible via a participatory process focused on leadership style and action learning from feedback and evaluations (Mash et al., 2016).

A telling leadership style versus a selling or participative leadership style shows a supportive or participative leadership style climate correlates positively with employee motivation and performance (Novac & Bratanov, 2014). Employee commitment and success is driven by leadership's involvement in overall work quality and standards (El Khouly & Fadl, 2016). The cultural characteristic is the most important factor in lean processes. The lack of

understanding of what cultural dimensions must be aligned with the lean implementation process hinders the success of cultural change (Pakdil & Leonard, 2015).

In summation of the organizational culture theme, it was ascertained that culture plays a significant part in achieving employee engagement, productivity, and organizational results. Leadership actions and communication profoundly influence employee engagement. Culture when adequately supported and executed can achieve both elevated employee engagement and organizational results.

In summary and conclusion, concept two, leadership interaction, has the themes of influence performance, style of approach, and organizational culture. Leaders must possess listening skills, communications skills, develop interpersonal relationships, and exercise trust and dialog (Ejimabo, 2015). Leadership style has a significant impact on employee performance, which affects organizational performance (Igbaekemen & Odivwri, 2015). Employee commitment and success is driven by leadership's involvement in overall work quality and standards (El Khouly & Fadl, 2016).

Employee Engagement Concept

Concept three that emerged from the literature review was employee engagement with the theme topics of standard work for quality requirements, execution gaps, and performance results. Employee engagement or involvement may influence organizational results, customer satisfaction, and continuous improvement support (Gambi et al., 2015). Employee engagement via motivation is necessary to ensure standard work is executed as expected (Teryima et al., 2016). The engagement can support the identification and closure of gaps in systems or performance.

Standard work for quality requirements theme.

The standard work for quality requirements theme was explored as part of the literature review concept topic employee engagement. Standard work, or how to perform a task or function, provides the method of ensuring work is completed as expected to improve customer satisfaction and reduce the cost of poor quality. Adherence to standard work ensures a reduced risk of both creating suspect product and increasing the cost of poor quality. Standard work should highlight gaps in the systems or requirements. Employee engagement is critical to ensure standard work expectations are achieved.

Developed from the literature review, a historical view of standard work indicates a relationship between standard work, employee engagement, and the successful execution of quality assurance. The historical origins of employee engagement in relation to robustness, dedication, and concentration tie to self-worth and confidence in self-competencies (Dagher et al., 2015). Engaged employees play a critical function in the realization of organizational objectives (Ahmed et al., 2015). Exceptional quality is a basic requirement of organizational objectives (Manghani, 2011). Quality systems, when appropriately executed are the means to achieve these objectives and attain success (Manghani, 2011).

Quality requirements, when adequately established and executed, impact the achievement of objectives. Quality systems and standard operating procedures are requirements to achieving business objectives (Manghani, 2011). Organizations and companies without robust quality systems that include integral quality documents and standard operating procedures struggle to provide high-quality products and services (Manghani, 2011). Standard work can be implemented and improve the culture and organizational issues such as poor product quality and customer satisfaction in any organization (Feng & Ballard, 2008).

Employees are the most valuable resource for improving quality (Manghani, 2011). Employees impact work requirements and outcomes. Ultimately, everyone is responsible for quality within the company, and the quality system is what is followed to achieve success (Manghani, 2011). Companywide support is required to ensure standardized work (Jurburg, Viles, Jaca, & Tanco, 2015). Employee involvement is critical for sustaining improvement changes in the organization (Souza & Rachid, 2016).

For standard work (quality systems and continuous improvements systems) to be successful and fully integrated, an accountable process owner and an adequate measuring system to monitor are essential (Jurburg et al., 2015). Standard work can overcome variability in work processes that otherwise may increase breakdowns, errors, and cost overruns (Feng & Ballard, 2008). Seven steps can reduce errors: 1) education and training, 2) rules and policies, 3) communication, teamwork, and reporting, 4) checklists, reminders, and double checking, 5) simplification, standardization, and organization, 6) computerization and automation, and 7) forcing function, the process of making it impossible for mistakes to occur, will reduce errors in standard work (Zikhani, 2016).

Standard work is a basic quality concept for lean implementation. As such, consistent application of applicable standard work will improve the performance of an organization to help deliver the primary goals of production. These primary goals are to produce products, reduce costs, time and inventory, and meet customer expectations (Feng & Ballard, 2008). For a program such as standard work to be effective, it must have the critical factors of implementation of scope, work organization, planning, management, and employee involvement (Samman & Ouenniche, 2016).

In summary and conclusion, standard work quality requirements highlight that everyone is responsible for quality. Successful systems involve methodical and logical steps that require employee engagement. Employees impact work requirements and outcomes. Standard work provides the ability to reduce risks of errors and improves the potential for customer satisfaction.

Execution gaps theme.

The execution gaps theme was explored as part of the literature review concept topic employee engagement. Employee engagement is essential in closing gaps in management systems and standard work. Employee engagement impacts work execution within organizations. Managers and leaders have a direct influence on the level of employee engagement that can translate into employee and organization improvements.

A historical view indicated that knowledge affects gaps in executing work requirements. Eighty-five percent of employees have a lack of trust that leaders' have the required knowledge to develop employee engagement (Czarnowsky as cited by Dagher et al., 2015). Analyzing the effectiveness and efficiency of the management systems allows problem-solving by methodical, systematic approaches (Vasilkov & Gushina, 2014). The analysis facilitates the establishment of agreed-upon opportunities or gaps based on the knowledge of the current management system (Vasilkov & Gushina, 2014).

When Lean Six Sigma themes such as motivating factors, benefits, limitations, and impending factors are implemented correctly, a solid strategy to deploy continuous improvement to achieve quality and operational excellence is possible (Albliwi, Antony, & Lim, 2015). Six Sigma can be considered a part of a comprehensive quality program that supports a structured method such as standard work and problem solving (Chooa, Linderman, & Schroeder, 2007). The structure method facilitates learning and knowledge creation (Chooa et al., 2007).

Implementing and sustaining the knowledge management system is dependent on the human factor or employees who are essential to achieving success and maximizing value (Asiedu, 2015). Centralized knowledge provides a more robust system that is essential for organizations and companies to meet objectives and to ensure better quality decision making. Dispersed knowledge needs to be gathered and centralized, as complete knowledge along with effective communication is the key to productive manager and employee decisions in the workplace (Abbott, 2015).

Work execution gaps can be related to behavior-based situations. Employees who can establish strong organizational ties could maintain strong performance in the organization. Employees experiencing high levels of job satisfaction had a higher commitment to their organization (Mehmet & Büşra, 2015). Leaders must help develop self-efficacy to boost employee engagement (Dagher et al., 2015). Change agents have a higher level of success by gaining employees' support and trust through listening and recognizing the reasons for resistance (Bradutanu, 2015). Management and employee engagement along with open discussion is recommended to ensure the cooperation of implementation and sustainment (Bradutanu, 2015).

Factors such as human error, equipment malfunction, or defective raw material may cause errors in the production flow. Any production error causes extra costs and disturbs the production flow. Most errors were related to human errors which can be tied to the employees or the work organization (Ollikainen & Varis, 2006). Development activities must be focused on employees skills and the work organization (Ollikainen & Varis, 2006). Organizations must take responsibility for the behavior of others in the organization and include the voice of both managers and workers when sponsoring training (Tran & Jeppesen, 2016).

Employee engagement impacts work execution within organizations. Employee performance is tied to effectiveness, efficiency, and execution of duties that affect overall business performance (Iqbal et al., 2015). Engaged employees improve the overall performance of the organization and engagement leads to increased productivity, retention, and profitability (Bhavani et al., 2015). Seventy percent of variance or gaps in employee engagement can be attributed to leaders and managers of the organization (Pollock, 2016). Top management must provide the training and a positive teamwork environment to ensure employee engagement via the quality systems and standard operating procedures exists (Manghani, 2011). Increasing supervisor knowledge of the tactics such as collaboration, consultation, appeals, ingratiation, and persuasion to seek employee commitment can increase the success of continuous improvement implementation (Lam, O'Donnell, & Robertson, 2015).

Supervisor influence has an impact on continuous improvement success (Lam et al., 2015). "Leadership, strategic planning, process management and human resource management have a direct and positive effect on three pillars of knowledge management that are knowledge acquisition, applying knowledge and knowledge distribution" (Farshid & Amir, 2016, p. 142). Performance indicators may reduce the risk of crises and improve efficiency and productivity for an organization (Gagarinskii, Kuznetcova, & Gagarinskaia, 2016).

In summary and conclusion of execution gaps, it was recognized that job satisfaction is a means to ensure employee engagement. Specific standard work and expectations allow employees to perform. Leaders and managers who are able to engage employees and create a consistent message tend to have satisfied employees. Employee engagement impacts work execution within organizations.

Performance results theme.

The performance results theme was explored as part of the literature review concept topic employee engagement. Performance, based on employee engagement, impacts customers, return on investment, the cost of poor quality, productivity, and internal results. Leaders must monitor performance to ensure correct and timely management decisions. The ability to make consistently successful decisions influences employee and organization results.

The historical view of performance confirms that relationships, employee engagement, customer satisfaction, standards, and leadership influence the results. Relationship concepts including trust, commitment, communication, and conflict are significant contributors to relationship quality and customer satisfaction (Negi & Ketema, 2013). Employee engagement has been shown to facilitate the achievement of organizational and individual objectives. Effective standards that have been written, understood, and specific as possible can motivate employee performance (Daft as cited in Teryima et al., 2016).

To be innovative and successful organizations need workers to think, otherwise, talent is wasted and opportunities are lost. Knowledge data must be validated before disseminated across the organization. Knowledge is used to help make decisions and derive theory from past experiences; without full participation, organizations do not rise to their full potential (Newell, 2015). Manufacturers and retailers should take action on products that fail or are defective to reduce the adverse effects the issues have on the relationship with their customers (Paulssen & Catenazzo, 2015).

Customer complaints have a duty to be used to improve the quality system (Hsieh, 2012). Customer satisfaction is a significant predictor of the customer relationship and understanding how the customer relationship works is relevant to ensuring long-term customer relationships

(Negi & Ketema, 2013). Leadership styles that drive engagement with customers need to be equally focused on employees to ensure customer satisfaction (Popli & Rizvi, 2015).

Leadership is the main reason for the success or failure of quality programs and people or employees' need proper training to perform tasks in a culture of trust (Hsieh, 2012). Companies that perform well on management also do well in productivity; employees who are recognized for good performance based on targets and incentives are happier and willing to go beyond to improve the organization (Klotz, 2016). Structured management is essential for continued growth and endurance, as organizations continue to collect and act on data companies continue to improve (Klotz, 2016).

Incentivizing and motivating employees improves satisfaction, performance, and commitment to the organization (Klotz, 2016). Motivating employees to go beyond job requirements and engagement developed by training, relationships, reward, and recognition is the necessary element in executing sustainable changes in an organization (Balaji, 2014). Employee performance evaluations are essential in ensuring employee training, and development programs meet the need of the organization and are effectively implemented to ensure improvements with employees and the overall organization (Nikoloski, 2016).

Organizations must have processes that deliver products and services at the desired quality for the lowest cost possible, on time, as expected and in full, to thrive in a competitive environment. Leaders must monitor performance to ensure correct and timely management decisions. Monitoring is supported by meshing strategy with reality and aligning people with goals (Gawankar, Kamble, & Raut, 2015).

Organizational success can be linked to employee engagement. Six Sigma tools can help support strategic planning, and project management to improve an organization's ability to

accomplish its mission and goals (Grover, Kovach, & Cudney, 2016). Quality and productivity are not the same or synonymous. In the past quality came in to enhance products and productivity declined, at present both quality and productivity are positioned where quality can improve productivity, and in the future productivity and quality will be equally crucial for organizational growth and excellence (Gidey, Beshah, & Kitaw, 2014).

Leaders' nonverbal gestures impact how followers interpret and react. For example, powerful positive positions that leaders should incorporate in their interactions with followers are hands palm up, hands clasped in front at waist level, and steeple hands with fingertips touching (Talley & Temple, 2015). In addition, personality type has a significant impact on productivity and managers must employ communications and intra-organizational variables on employees based on their personality to improve organizational success and employee engagement (Najam-us-Sahar, 2016).

Leadership must be held accountable for driving changes in the organization that are positive and enhance employee engagement (Thistle & Molinaro, 2016). Managers' accountability and ownership of metrics associated with improvement and for employee engagement are essential (Batra, 2016). Managers and leaders are accountable to improve engagement and thus raise the performance and results (Batra, 2016).

In summation of performance results, it was apparent that customer satisfaction, employee engagement, and organizational success are interlinked. Leadership and communications are great influencers on performance. Moreover, the leadership and communication approaches influence employee engagement levels. Results via employee engagement have been shown to achieve organizational and individual objectives.

Organizational performance is positively associated with increased employee engagement.

In summary and conclusion, concept three, employee engagement, has the themes of standard work associated with quality requirements, execution gap, and performance results. Standard work can overcome variability in work processes that otherwise may increase breakdowns, errors, and cost overruns (Feng & Ballard, 2008). Employee performance is tied to effectiveness, efficiency, and execution of duties that affect overall business performance (Iqbal et al., 2015). Leadership is the main reason for the success or failure of quality programs and people or employees' need proper training to perform tasks in a culture of trust (Hsieh, 2012).

Synthesis

The literature review provided insight into several key elements of potential reasons for inconsistent standard work execution as illustrated in Figure 2. From the literature review, it was apparent that leaders and managers have a significant influence on employee engagement. Employee engagement, in turn, relates to employee satisfaction. Employees that are engaged and satisfied tend to have better performance and productivity. When employees have better performance, the organization performs at a higher level. When organizational performance improves, customers tend to have better service and products. The completion of customer orders, on time and correct, leads to increased customer satisfaction. Overall, when organizations perform at improved levels, the cost of poor quality goes down, and financial results improve.

Figure 2. Synthesis of Literature Review

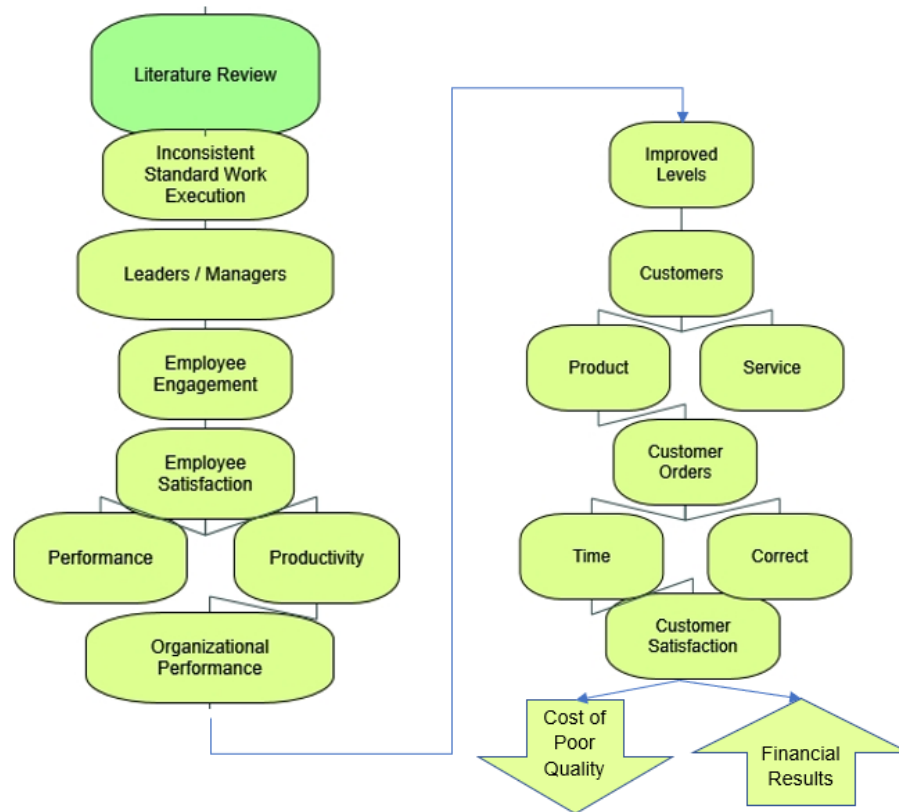


Figure 2. Flow chart of Literature Review synthesis insights for inconsistent standard work execution. This figure illustrates that leaders and managers have a significant influence on employee engagement.

The resources that have a significant impact on the findings are listed in the references.

The total resources for the Chapter 2 literature review and the full dissertation are summarized in Table 1. The summary highlights the main findings from the research. Historical findings consistently support that job training directly impacts the organization's performance (Halidu, 2015). Training that is engaging utilizes various trainee-centered instruction methods to accommodate learning styles (Arghode & Wang, 2016). When trainee-centered instruction is combined with developing a rapport with learners, knowledge sharing results are maximized (Arghode & Wang, 2016).

Table 1

Synopsis of Sources in the Literature Review

Chapter 2. Literature Review Sources			
Reference Type	Total	Less than 5 years	Greater than 5 years
Researched-based peer review journals	85	71	14
Dissertations	0	0	0
Conference and forum proceedings	5	3	2
Germinal and contemporary books	6	2	4
Websites	1	1	0
Total	97	77	20

Total Dissertation Literature Sources			
Reference Type	Total	Less than 5 years	Greater than 5 years
Researched-based peer review journals	131	102	29
Dissertations	2	2	0
Conference and forum proceedings	9	5	4
Germinal and contemporary books	15	5	10
Websites	95	93	2
Total	252	207	45

Note. Total sources for dissertation are 252 plus three computer software programs 82% of references within the last 5 years.

Summary of the Current Status of the Problem in Light of Recent Research

Positive organizational behavior influencing job satisfaction can be tied to employee performance and hence overall organizational success and competitiveness (Pouramini & Fayyazi, 2015). Employee satisfaction increases when organizations invest in training, organizations that monetarily invest in training tend to have higher profit margins (Haines & Spreen, 2015). Employees with high involvement levels can be associated with the job being essential to the individual's self-image (Kanungo as cited by Sahoo et al., 2015). Employee engagement is the necessary element in obtaining success and executing sustainable changes in an organization. Engagement is motivating employees to go beyond job requirements and engagement is developed through training, relationships, reward, and recognition (Piai-Morais et al., 2015).

To achieve top quality service and products for improved bottom line results every step and every person in the organization must engage in work quality (El Khouly & Fadel, 2016). Personal coaching, functioning through feedback, and engagement of leadership peers are essential for a value-based culture, and the momentum needs to be maintained to sustain the culture (Mash et al., 2016). The most efficient state of performance and efficiency of the organization is achieved when there is an alignment of the resources, the least amount of organizational friction, and customer requirements are achieved (Horne, 2016).

Standard work can overcome variability in work processes that otherwise may increase breakdowns, errors, and cost overruns (Feng & Ballard, 2008). Employees are the most valuable resource for improving quality, high quality is a fundamental requirement, and quality systems when appropriately executed are the means to achieve success (Manghani, 2011). Engaged

employees play a critical function in the realization of organizational objectives (Ahmed et al., 2015).

The surveys, field observations, and interviews determined the reasons for standard work gaps in the dissertation organizations. The employee, leader, manager, and cultural components were researched. The necessary data was obtained from the manufacturing organizations that the dissertation was researching. Possible directions for future research are ways to benchmark successful managers. The element that is unclear concerning managers and leaders is why they choose to lead or manage in their selected style. There perhaps is a perceived notion that managers or leaders do not understand the damage they are causing in their communication to others in the organization. Another direction for future research is why do management and employees have different perspectives of what is happening on the manufacturing floor. Several managers assume standard work and requirements are being performed, but in reality, there are gaps in execution.

CHAPTER 3. METHODOLOGY

Overview

The purpose of this qualitative method case study was to increase understanding of the causes of employees' failure to comply with standard work and to develop a grounded theory to support standard work compliance within several organizations. Work that, when performed consistently, reduces the risk of nonconformance quality escapes and the cost of poor quality that the organization and customers may experience. The content of this chapter provides the methodology utilized to perform the research to ensure the findings can be replicated. Ethical considerations were implemented before human interaction for surveys, field observations, and interviews occurred. Organization of the remainder of the chapter includes the following topics: Research Questions, Research Design, Overview of Research Approach Used in the Study, Overview of Quality Management Model Used in the Study, Population and Sample, Selection of Participants, Instrumentation, Procedures, Data Collection, Data Analysis, Reliability and Validity, Synthesis and Summary of Data.

The content of this chapter addresses the dissertation problem statement. Quality performance at manufacturing plants was inconsistent because standard work processes were not followed. Despite instructions on how to perform specific manufacturing processes that would result in defect-free products (Feng & Ballard, 2008), customer complaints have occurred in multiple organizations and in some cases at multiple sites. The investigated customer complaints were linked to gaps in executing standard work requirements.

In the organizations studied in the research, training in quality standard work has been conducted annually. In addition, communication of customer satisfaction associated with zero complaints caused by standard work variance has been provided. The knowledge sharing of

standard work expectations and customer satisfaction levels was established to convey the need to follow the quality guidelines (Asiedu, 2015), as it has been expressed that employee engagement motivates employees not only to perform but also to go beyond job requirements (Balaji, 2014). However, even with the evidence of customer satisfaction due to standard work consistency, employees did not complete the standard work requirements as expected.

A qualitative method case study was completed to gain an understanding of why there were consistency issues with executing the standard work requirements. The means (instruments) to gather data were surveys, field observations, and interviews. The specifics of how ethical considerations were implemented and honored before conducting the research are provided. The study received ethical approval from the National Graduate School (NGS) / New England College of Business (NECB) Institutional Review Board (IRB) before participants were engaged.

Ethical Considerations

Protecting Human as Research Subjects training and testing provided by the NIH Office of Extramural Research was successfully completed prior to interacting with study participants and respondents. The certificate from the NIH validating the proof of training is in Appendix A. An Institutional Review Board (IRB) application was completed for this study. An example of the IRB Application Form is in Appendix B. The study received ethical approval from the IRB National Graduate School within the New England College of Business before participants were engaged.

Several items were accomplished as stipulated in the IRB application. The identity of the individuals in the study remained anonymous to ensure peers, managers, and leaders were unable to trace responses to individuals. Individuals were volunteers and joined the study of their own

free will. Per the IRB application, individuals were not required to sign the consent. As individuals were guaranteed anonymity, the consent requirement was attached to the actual survey and interview questions. The consent information was reviewed and read prior to participants making the decision to complete the survey or participate in the interviews. Individuals who were not willing to provide consent did not participate, and those that were willing provided consent by completing the survey or participating in the interviews. The survey participant disclosure and consent statement is provided in Appendix C.

Individuals were provided the time to participate in the study during regular working hours. Participation entailed completing survey questions related to the research questions. Additional observations of work activity occurred for select participants to allow the researcher to witness the execution of the standard work in the field. As observations were a regular part of the participants' work environment, no consent information was provided or necessary. Participants observed remained anonymous.

Participant recruitment resulted in 178 survey, 10 observation, and 10 interview participants. Several organizational factors described the participant population associated with the dissertation. As shown in Table 2, the sample population included 148 hourly employees and 30 salary or leadership employees. The risk level to participants in this research was reported to be minimal on the IRB application, and no reports of harm or discomfort were received from any of the participants of this study. Finally, as stated in the IRB application, an executive summary of the results of this study was provided to all participants of this study. As individuals remained anonymous, the summary was posted in the respective breakrooms of the participating plants.

Table 2.

Research Population by Participant Category

<u>Plant Location</u>	<u>Pop. Emp.</u>	<u>Pop. Leaders</u>	<u>Sample Pop. Emp.</u>	<u>Sample Pop. Leaders</u>
PA 1	25	6	22	6
CA	12	3	12	3
KY	40	5	32	5
PA 2	60	11	53	10
PA 3	32	6	29	6
Total	169	31	148	30
Totals	N=200		n=178	

Note. Pop. = Population; Emp. = Employee; PA = Pennsylvania; CA = California; KY- Kentucky

Organization of the Remainder of this Chapter

The design of the study is described in five main sections that comprise this chapter. The first section of this chapter presents the research questions. The second section of this chapter presents the research design, which includes an overview of action research, paradigm worldview of constructivist with a qualitative method research design of a case study research, and the rationale for selecting a qualitative method methodology. The third section provides the rationale for selecting the participants for this study. The fourth section delineates the methods used for data collection, including the survey and observation and interview questions. The fifth section consists of the analysis of the data.

Research Questions

The central research questions that guided this study were:

- How does quality-focused manufacturing leadership influence employee standard work execution consistency?
- How does training and accountability influence employee standard work execution consistency?
- Do organizational culture and employee engagement factors contribute to standard work consistency?

Research Design

This is a Professional Practice Dissertation that integrated theory and practice by applying methods of research and scholarship as practitioners to a business-related problem that added to the quality management body of knowledge. Quality management is the application of formalized systems to achieve maximum customer satisfaction at the lowest overall cost to the organization while continuing to improve processes ("Quality Management," 2018). The dissertation was based on a holistic quality management model, and quality management principles and techniques were used.

The overarching methodological approach of this dissertation utilized the paradigm worldview of constructivist combined with interpretivism, which focused on understanding the meanings that social actions have for the people studied (Zhou, 2012). The research assumptions within this constructivist worldview were epistemology. Epistemology includes human element interpretation through study and field observations (Bunge, 1983). The research assumptions associated with epistemology were the acknowledgment that research is value-laden.

Epistemology is, "...what it means to know..." (Scotland, 2012, p. 9); moreover, information gathered beyond the literature research was as close as possible to the source.

A qualitative method approach was applied to execute the research associated with the dissertation. The qualitative approach was a case study to provide the researcher the ability to perform in-depth research (Creswell, 2014) on inconsistent quality performance due to standard work process execution gaps. A traditional case study approach was applied to answer research questions across three manufacturing organizations in five plant locations that operated with the same objectives for quality work standard results. These objectives were to ensure error-free supply to customers to facilitate achieving customer loyalty, reducing costs, and improving performance of the organization. The participating organizations were industry leaders of custom-made products such as electrical components and packaging containers for use across multiple markets such as automotive, food, beverage, personal care, and household. The organizations produced custom, high volume, low-cost products for well-established, stable blue-chip customers.

The research produced a grounded theory (Creswell, 2014) based on social structure and human behavior insights. The grounded theory evolved from the case study methodology that included surveys, observations, and interviews as well as literature research. The researcher applied the data triangulation approach to the data sources (Creswell, 2014). The triangulation approach on multiple data collection methods was utilized in relation to the surveys, observations, and interviews.

The grounded theory evolved from the data gathered in the natural setting, a characteristic where essential data was obtained in the field (Marshall & Rossman, 2016) at the sites where the lack of following the quality standard work occurs. The point of view from

which the problem was explored was from both the employee and the leadership perspective.

Basic qualitative research characteristics from a historical development view specify,

“...divisions of science have a qualitative side that draws on personal experience, intuition, and skepticism ... qualitative relies on human perception and understanding...qualitative thinking has been used by Newton, Curie, and Galileo...” (Stake, 2010, p. 11).

As part of the case study, the Social Cognitive Theory of human functioning developed in the 1980s by Albert Bandura (Pajares, 2004) was applied to the dissertation. The social cognitive theory rooted in agentic perspective harmonizes processes such as cognitive, self-regulatory, and self-reflective in human transformation (Bandura, 2001). As summarized by Pajares (2004) in relation to Bandura’s work, “...in an agentic perspective people are self-organizing, proactive, self-reflecting and self-regulating, not just reactive organisms shaped and shepherded by environmental forces or driven by concealed inner impulses” (para. 8).

The scope of this dissertation was limited to quality standard work that utilized human interaction and directly influenced customer satisfaction. The type of standard work explored in this dissertation resulted in customer complaints due to variation in execution which resulted in non-value-added costs and defects. The failure to perform standard work lead to customer complaints (Manghani, 2011). Customer dissatisfaction, complaints, cost of poor quality, and loss of business resulted from standard work variances. The ISO 9000 series framework ("ISO Quality 9000," 2015) was utilized for creating, validating, and executing standard work processes.

A Process Failure Mode and Effect Analysis (PFMEA) methodology was employed for customer quality complaints associated with standard work variances. The PFMEA was utilized to analyze the participating organizations confidential and proprietary customer complaints. As

part of the PFMEA process, the identified risks from both 2016 and 2017 calendar years were assessed qualitatively using the process failure and effect analysis (PFMEA) technique and prioritized for further quantitative assessment (Shah, Etienne, Siadat, & Vernadat, 2016). The PFMEA reviewed all potential ways for customer complaints to be created; however, a Pareto analysis clearly showed that most root causes were tied to standard work variation. As such, this dissertation focused on the events related to the standard work variation.

The Six Sigma Define, Measure, Analyze, Improve, and Control (DMAIC) model (Pyzdek & Keller, 2013) was applied to ensure the completion of a cohesively executed project and dissertation. The application of the Six Sigma DMAIC model fit into the stages of the dissertation project. The incorporation of the plan, do, check, and act (PDCA) cycle (Pyzdek & Keller, 2013) ensured the DMAIC steps were completed. The dissertation execution flowed through the DMAIC process. The first phase was to define the problem. The second phase was to measure using literature reviews, surveys, observations, and interviews. The third phase was to analyze the data collected which was followed by making suggestions for potential improvement. Finally, the last phase of DMAIC was to make suggestions for controlling to sustain and to execute continuous improvement activities.

The reason for the phenomena of deviating from the quality standard work requirements was not known, as it did not consistently occur for each deviation event; however, it periodically occurred across multiple locations. It was important to understand the factors that were causing the inconsistency in standard work execution, in order to increase customer satisfaction, reduce the cost of poor quality, and improve the return on investment. The qualitative research study focused on standard work process execution variances.

Overview of Research Approach Used in this Study

A qualitative method approach was applied to execute the research associated with the dissertation. The qualitative approach was a case study which provided the researcher the ability to perform in-depth research (Creswell, 2014) on inconsistent quality performance due to standard work process execution gaps. A traditional case study approach was applied to answer research questions (Yin, 2002). The qualitative case study employed the grounded theory to, "... derive a general, abstract theory of a process...in the views of participants...using multiple stages of data collection" (Creswell, 2014, p. 14).

The qualitative research approach was selected based on the criteria defined by Creswell (2014). The qualitative approach was utilized to explore and understand the human problem of executing standard work requirements as expected. The data was collected in the participants' setting. The research method included a qualitative method approach and interpretivism, which included the human element and interpretation through study.

The constructivist worldview was selected as it best fits the approach that was necessary for this dissertation topic. The topic, Quality Assurance Consistency: Execution Gaps in Manufacturing Plants explored how leadership, training, accountability, organizational culture, and employee engagement factors influence quality standard work execution consistency. Additional characteristics included epistemology and methodology assumptions. The research assumptions associated with epistemology were the acknowledgment that research is value-laden and information gathered beyond the literature research was as close as possible to the source.

This dissertation included surveys, observations, and interviews, which tied directly to the epistemology research assumption. The qualitative methodology utilized was a case study approach specifically related to multiple small size industrial locations in manufacturing

companies of custom, high volume, low-cost products for well-established, stable blue-chip customers. As part of the case study, the plan incorporated other data collection tools such as surveys, observations, and interviews. The data triangulation approach on multiple data collection methods (Creswell, 2014) was applied to the surveys, observations, and interviews.

The research design was based on identifying the factors that influenced the lack of adherence to quality standard work consistency. The design provided the researcher the ability to obtain information and insights from the main influencers, namely leaders and employees. The data collected provided the ability to gain an understanding of the relationships regarding organizational performance, productivity, customer satisfaction, and value.

The qualitative design was based on a social constructivism perspective. Research problems become research questions based on prior research or experience. Sample sizes can be as small as one. Data collection involved interviews, observations, and literature review content. Interpretation was based on a combination of researcher perspective and data collected (Biddix, 2009, para. 2). Guidelines for performing a case study with field observation can be found in *The Art of Case Study Research* (Stake, 1995).

A qualitative study can be found in Guidelines for Improving Productivity, Inventory, Turnover Rate, and Level of Defects in Thailand Plastic Industry (Piyachat & Chanongkorn, 2015). Qualitative research methods can be found in a data collector's field guide (Mack et al., 2005). A case study and qualitative research examples can be found in the various literature (Arghode & Wang, 2016); (Stake, 1995); (Stake, 2010); (Roulston, 2016), and (Yin, 2002).

The history of qualitative research was initiated after World War II by a social movement (Seale, 2004). Social and cultural research was organized in a manner that legitimized the approaches utilized for human inquiry (Seale, 2004). Before World War II, qualitative and

quantitative distinctions were not significant or highlighted. Social survey methods led by the United States began to dominate the methodological thinking and practice in human sciences around the 1950s (Seale, 2004). During this period, the qualitative and quantitative methods became more distinctive, and the qualitative method became an individualized form of research.

Qualitative research is a type of scientific research. In general terms, scientific research consists of an investigation that seeks answers to a question. It also systematically uses a predefined set of procedures to answer the question and collects evidence. The research produces findings that were not determined in advance and findings that are applicable beyond the immediate boundaries of the study. Additionally, qualitative research seeks to understand a given research problem or topic from the perspectives of the local population involved.

Qualitative research is relevant in acquiring cultural information about the values, opinions, behaviors, and social contexts of populations (Mack et al., 2005).

Overview of Quality Management Model Used in the Study

The quality management model that was utilized for this study was the ISO quality management standards ("ISO Quality 9000," 2015). The International Organization for Standardization develops, through shared knowledge, voluntary, market-relevant guidelines for quality. The current standard work, risk approach, and record creation are under an ISO structure. From a holistic approach, top management is committed to quality, and the facilities and leaders utilize the ISO quality management system to lead the organization. The organization understands how to work the quality management system as a set of processes to satisfy the needs of customers and stakeholders.

The management principals and techniques used to implement the performance improvement process for this study was based on the scientific method. DMAIC was the Six

Sigma technique utilized (Pyzdek & Keller, 2013). DMAIC is an abbreviation for Define, Measure, Analyze, Improve, and Control. The dissertation execution flowed through the DMAIC process. The first phase was to define the problem. The second phase was to measure using literature reviews, surveys, observations, and interviews. The third phase was to analyze the data collected which was followed by making suggestions for potential improvement. Finally, the last phase of DMAIC was to make suggestions for controlling to sustain and to execute continuous improvement activities.

The organizations, customers, stakeholders, and employees, are likely impacted by the implementation of the performance improvement process. Customer complaints associated with execution issues may be eliminated or significantly reduced. The reduction in the cost of poor quality, which is tied to the return on investment (Jeffery, 2003), will improve the organization. Employees are empowered to perform their required work as expected without the potential for having to make replacement production.

There were several strengths associated with this research design and process implementation. Study participants were open and honest with their responses as there were no consequences to any responses. Identities of participants were anonymous further supporting open and honest responses. Participant responses were anonymous as disclosure of names was not required on the survey form. In rare cases where a participant did include their identity, the researcher coded the survey for participant anonymity. The knowledge that participation identities and responses would remain anonymous and as such free of consequences facilitated open and honest replies.

The sites were utilizing standard work instructions for specified work that impacted customer quality. The individuals performing the required standard work reviewed the

requirements and had experience with executing the requirements. Survey responses from both the employee population and the leader population were similar in response regardless of the specific standard work task.

There were several limitations associated with this process implementation and research design. This study was restricted to three manufacturing organizations in five manufacturing plants with two distinct products in similar markets. Organizations with multiple locations were utilizing the same body of knowledge for standard work instructions. This study was limited to plants that had variance in standard work execution, which resulted in multiple personnel errors created customer complaints; as well as, plants where consistent standard work execution resulted in zero personnel error created customer complaints.

The initial confidential and proprietary PFMEA reviewed all customer complaints from the manufacturing plants. From the investigations and analysis, the complaints related to personnel created errors were caused by standard work variation. For the location with zero personnel created errors, the method of operation, financial resources, recruiting practices, and standard work methods were comparable or identical to the locations with personnel created errors. Manufacturing plant locations that were involved were also selected based on quality performance and the various markets serviced.

Standard work was utilized at the locations and has a significant impact on customer satisfaction. Standard work instructions on how to perform specific manufacturing processes result in defect-free products (Feng & Ballard, 2008). The quality performance ties directly to the customer satisfaction levels and potential growth of the organization (Manghani, 2011). The work requirements within the manufacturing organizations catered to customer needs. If individuals were not familiar with the standard work they were expected to execute, training was

highlighted as an area to focus on to the participating organizations. The outcome required a new look at culture, leadership, and standard work requirements. As such recommendations to change the current state were provided to management. Any opportunities were thoroughly reviewed and explained to leadership to ensure support for implementing change.

The standard work requirements for the United States facilities were the same for the global facilities in the organization. As such, the findings were interchangeable throughout the organizations. The results helped support additional areas of opportunity that have the same root causes. The potential for future continuous improvement can be applied at locations not only with customer complaints but with high internal rejects.

Population and Sample

The case study focused on three manufacturing organizations in five manufacturing plant locations that operated with the same objectives for quality work standard results. These objectives were to ensure error-free supply to customers to facilitate achieving customer loyalty, reducing costs, and improving performance of the organization. The participating organizations were industry leaders of custom-made products such as electrical components and packaging containers for use across multiple markets such as automotive, food, beverage, personal care, and household. The organizations produced custom, high volume, low-cost products for well-established, stable blue-chip customers. The participants were members of four manufacturing plants where variance in standard work execution has resulted in multiple personnel error-created customer complaints; as well as, members of one manufacturing plant where consistent standard work execution has resulted in zero personnel error-created customer complaints. Plants with and without standard work variances were selected to ensure participant responses spanned across all levels of quality performance for customers.

The individuals who volunteered to directly participate in the study worked in the participating organizations' manufacturing environments of the plants where standard work was being executed daily. The participants were individuals with jobs associated with production and quality responsibilities. Participants that were included in the survey, observations, and interviews were hourly production operators, quality inspectors, and end of line associates responsible for performing the quality standard work as well as salary participants who were the supervisors, managers, and leaders of the participants who were responsible for executing the standard work requirements. The same tools and data collection instruments have been used for all job classifications; however, 95% of participants were involved in only one of the three data collection methods.

The sampling method that was utilized was purposive sampling. Purposive sampling is the identification and selection of subjects or cases that have abundant information for the efficient use of minimal resources for research (Palinkas, Horwitz, Green, Wisdom, Duan, & Hoagwood, 2015). Purposive sampling of participants was selected as the research was based on preset criteria associated with the specific research questions. The preset criteria focused on individuals in manufacturing responsible for performing quality standard work and their managers. Sample sizes were dependent on the overall population of potential participants with jobs associated with production and quality responsibilities. The sample size was determined based on the population of the participating plants, data saturation point, and a margin of error within a plus or minus eight percent at a 95% confidence level. The purposive sample size was determined at the point in the data collection process where new data was not providing fresh outlooks to the research questions. Purposive sampling is best executed when data review and analysis are done in combination with data collection (Mack et al., 2005).

Purposive sampling sizes are determined by data saturation (Guest, Bunce, & Johnson, 2006). Data saturation is reached, according to O'Reilly & Parker 2012; Walker 2012 (as cited in Fusch and Ness, 2015), when enough information is obtained to replicate the research study and at "the point at which no new information or themes are observed in the data" (Guest, Bunce, & Johnson, 2006, p. 59). Data saturation is a means to ensure the research conducted has validity (Fusch & Ness, 2015). To ensure data saturation was attained, the researcher executed data triangulation or the use of multiple sources of data in this case surveys, observations, and interviews to enhance the reliability of the results (Fusch & Ness, 2015). Each data source was analyzed and then compared to the results of each other to determine where there was agreement and where there was incongruence. "There is a direct link between data triangulation and data saturation; the one (data triangulation) ensures the other (data saturation) ... data triangulation is a method to get to data saturation" (Fusch & Ness, 2015, p. 1411).

During the sample planning, the researcher also determined an acceptable margin of error with an associated confidence level to ensure reliable results. Margin of error is the largest anticipated difference between the true population and a sample estimate of the true population ("Margin of Error," n.d.). Survey researchers commonly have an acceptable margin of error between four and eight percent at a 95% confidence level ("What Every Researcher," 2008). Sampling error is the amount of variation that may exist between the population and sample result ("What Every Researcher," 2008). A confidence level is a statistical statement that expresses the probability that the result cannot be explained only by sampling error. As shown in Table 3, the research study results are reliable to within a plus or minus eight percent acceptable margin of error at the 95% confidence level. The confidence level indicates a 95% chance that if the research is repeated 100 times, 95 samples would have similar results.

Table 3

Margin of Error by Participant Category

<u>Plant Location</u>	<u>% Margin of Error</u>		
	Sample Population Total	Sample Population Employee	Sample Population Leader
Pennsylvania 1	6%	8%	0%
California	0%	0%	0%
Kentucky	7%	8%	0%
Pennsylvania 2	5%	5%	10%
Pennsylvania 3	5%	6%	0%
Over % Margin of Error	3%	3%	4%

Note. % Margin of Error calculated using (Pollfish, 2018).

The entire population included all production and quality employees of the manufacturing facilities that used standard work to drive frequently repeated work situational execution tasks. As shown in Table 4, the details of the participant population are listed by organization. In addition to the participant details, the status of the quality level was also provided. The quality level represents the performance in relation to complaints caused by standard work variation. High represents high performance and low complaints, Mid represents acceptable performance with room for improvement, and Low represents poor performance and a significant number of complaints. The Plant Status was also provided where “Established” was a plant that has been in operation for a minimum of 10 years, and “New” was a plant that has been in operation for less than three years.

Table 4

Research Population by Participant Category with Plant Information

<u>Plant Location</u>	<u>Pop. Emp.</u>	<u>Pop. Leaders</u>	<u>Sample Pop. Emp.</u>	<u>Sample Pop. Leaders</u>	<u>Quality Level</u>	<u>Plant Status</u>
PA 1	25	6	22	6	Mid	Established
CA	12	3	12	3	High	Established
KY	40	5	32	5	Low	New
PA 2	60	11	53	10	Mid	Established
PA 3	32	6	29	6	Low	New
Total	169	31	148	30		
Totals	N = 200		n=178			

Note. Pop. = Population; Emp. = Employee; PA = Pennsylvania; CA = California; KY= Kentucky Survey population by plant, leader, employee, quality level, and maturity of site.

The researcher also performed 10 standard work observations, at various participating manufacturing plant locations. The observations provided an opportunity to document the consistency or lack of consistency of the standard work performed during the observation. The participants under observation were from several of the listed job classifications that completed the study. The researcher documented observations and the recorded notes were utilized in the research as part of the qualitative analysis conducted in NVivo. Individuals observed remained anonymous. As part of the organizations' rules of employment, all employees were observed on a frequent basis as part of their job expectations. As employee observations were part of the work rules and participants were anonymous, consent for observations was not obtained as it was part of the participants' standard work requirements. The individuals being observed remained anonymous with only the location recorded. As shown in Table 5, the details of the observation and interview participant population are listed by organization.

Ten interviews were conducted. The interview method involved the participants being asked the same questions as the survey questions located in Appendix D with more opportunity for open-ended responses. The paper media survey with the consent information was handed to the participants for review. No names were collected, and only job classification and years of experience with the organization information was strongly encouraged to be submitted. The verbal interview responses to the survey questions were considered consent from the interview participants. As shown in Table 5, the details of the observation and interview participant population are listed by organization.

Table 5

Research Population Observation and Interview Participants by Category and Plant

Observations			Interviews		
<u>Plant Location</u>	<u>Sample Pop. Emp.</u>	<u>Sample Pop. Leaders</u>	<u>Plant Location</u>	<u>Sample Pop. Emp.</u>	<u>Sample Pop. Leaders</u>
PA 1	0	1	PA 1	0	5
CA	2	0	CA	1	1
KY	3	0	KY	3	0
PA 2	1	0	PA 2	0	0
PA 3	2	1	PA 3	0	0
Total N=10	8	2	Total N = 10	4	6

Note. Pop. = Population; Emp. = Employee; PA = Pennsylvania; CA = California; KY= Kentucky
Observation and Interview population by plant, employee, and leader.

Selection of Participants

In several manufacturing multi-site companies, recent customer complaints due to variation in executing standard work have resulted in non-value-added costs and defects. The defects included but were not limited to the customer receiving multiple products in a single dedicated product shipment, erroneous products, products with mixed labels, and malfunctioning products. The reason for deviating from the quality standard work requirements was not known, as it was not consistently occurring for each event; however, it had periodically occurred across multiple locations. The participants selected for this study were members of four manufacturing plants where variance in standard work execution has resulted in multiple personnel error-created customer complaints; as well as, members of one manufacturing plant where consistent standard work execution has resulted in zero personnel error-created customer complaints.

Participants were selected for this research by job title and expectations associated with the standard work requirements. The individuals who volunteered to directly participate in the study worked in the participating organizations' manufacturing environments of the plants where standard work was being executed daily. The participants were individuals with jobs associated with production and quality responsibilities. Participants that were included in the survey, observations, and interviews were hourly production operators, quality inspectors, and end of line associates responsible for performing the quality standard work as well as salary participants who were the supervisors, managers, and leaders of the participants who were responsible for executing the standard work requirements.

Participants were from manufacturing sectors that produced custom, high volume, low-cost, commodity-based products for blue-chip customers. The blue-chip customers, in turn, supplied large retail outlets for direct to consumer purchasing. Specifically, there were three

manufacturing organizations in five manufacturing plant locations that operated with the same objectives for quality work standard results. These objectives were to ensure error-free supply to customers to facilitate achieving customer loyalty, reducing costs, and improving the performance of the organization. Four of the five plant locations had customer complaints associated with variation in the execution of quality standard work requirements. The fifth location had zero complaints associated with standard work as the location has consistent standard work execution.

For the pilot study, participants were from three of the five plants as indicated in Table 6. The individuals targeted to volunteer to participate were based on the ability to ensure a balance of hourly and salary participants. The goal was to ensure a large enough sampling from various positions thus allowing for multiple levels of the team to review the questions and provide feedback for clarity.

Table 6

Survey Pilot Sample Population by Participant Category

<u>Plant Location</u>	<u>Pilot Sample Population Employees</u>	<u>Pilot Sample Population Leaders</u>
Pennsylvania 1	6	6
California	5	0
Kentucky	3	1
Pennsylvania 2	0	0
Pennsylvania 3	0	0
Totals (N = 21)	14	7

Note. Employees represent hourly participants and Leaders represent salary participants.

Instrumentation

The instruments that were utilized to collect the qualitative data were created for three basic methods which were surveying, observing, and interviewing. The first method was a Likert scale-based survey with questions utilized for several participants (Biddix, 2009). The survey instrument was created based on the research questions. A preliminary survey was created and submitted to the dissertation committee. The dissertation committee provided feedback and suggestions, which were adopted and utilized to draft the pilot study survey.

The survey instrument was validated via a pilot study. Pilot study participants provided feedback on the questions. The feedback consisted of suggesting minor wording changes to clarify the questions but not alter the intent of the questions. The feedback was direct and beneficial in ensuring the survey was straightforward and easily understood by the respondents. Minor changes were made resulting in a survey less ambiguous and more straight forward to complete in minimal time.

The responses for the survey questions located in Appendix D were tabulated utilizing a Likert-type scale from strongly disagree to strongly agree. For questions that were positive in nature, the coding was completed in ascending order with a response of strongly agree equaling a five. For questions that were negative in nature, the coding was completed in descending order with a response of strongly disagree equaling a five. Survey questions 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 16, 20, 23, 24, 25, 27, 28, 29, 30, 33, and 34 were defined by the researcher as positive in nature and survey questions 11, 12, 13, 14, 17, 19, 21, 22, 26, 31, and 32 were defined by the researcher as negative in nature. Question 18 was not coded as it was presented as an open-ended response. The coding allowed for the data to be quantitatively analyzed in the Minitab statistical software.

The second instrument method was observations for general notes. Observations for general notes were used to generate information on standard work activities (Biddix, 2009). The observations allowed the researcher to witness the standard work being executed. The researcher concentrated on the standard work tasks and the participants' adherence to executing the tasks. Observations were conducted by the researcher at the point of standard work execution. Observations were conducted using the following guidelines. The researcher was the sole individual making and documenting the observations. Individuals observed remained anonymous to help eliminate the Hawthorne effect. Observations were not announced as they were conducted as part of normal operations and visits to the production floor. The researcher was not directly involved in the standard work of the activity. The researcher was located outside of the work zone but close enough that all activity was visible. Observations were made focusing on employees performing a defined set of standard work tasks. The researcher had a copy of the standard work instructions and made handwritten notations on paper based on what was observed. Deviations and compliance to the standard work steps as well as how the employee acted during the task was noted. Information collected was entered into NVivo quantitative analysis software, coded, and analyzed for interpretation and reporting.

The third instrument was interviews with the same closed-ended survey questions designed to obtain individual participants perspectives (Biddix, 2009). The interviews also provided the participants an opportunity to offer additional commentary associated with standard work execution. The survey and interview questions were related to the research questions and themes.

The survey questions utilized a Likert type scale. The observations allowed for viewing standard work execution in the natural environment. The interview questions were the same as

the survey questions but provided the participant the ability to make commentary outside of the specific questions. The research instruments provided the necessary information regarding standard work circumvention during the execution of daily activities to address the research questions.

The survey data were coded with the participants' plant location and job classification. If the participant was willing to volunteer their gender, age, duration of employment, education level, work shift assignment, or name, the data was coded for confidentiality purposes. A Likert-type scale from strongly disagree, to strongly agree was utilized for the following questions:

1. My supervisor gives me ongoing feedback that helps me improve my performance.
2. My supervisor holds me accountable for performance.
3. My supervisor holds my co-workers accountable for performance.
4. I understand how my work directly contributes to the overall success of my company.
5. I received training on the standard work for my job.
6. I understand my responsibilities in executing standard work.
7. I understand "why" the standard work is important.
8. I understand how to execute the standard work requirements.
9. My co-workers know how to execute the standard work requirements.
10. I know where to find the standard work requirements, for example, the work instruction or form for completion.
11. Sometimes, I skip steps of the standard work.
12. I skip steps because I do not know how to do them.
13. I skip steps because I do know how to do them.
14. Standard work steps are skipped because there is not enough time to do all of them.

15. I will notify my supervisor when there is something missing from the standard work.
16. I will notify my supervisor when there is something incorrect in the standard work.
17. Standard work steps are skipped because some steps are not needed.
18. If I skip steps, it is because (please fill in the blank):
19. If standard work process steps are skipped, no one will comment or say anything.
20. I let my supervisor know if I cannot perform all of my standard work.
21. My supervisor told me to stop doing the steps of the standard work.
22. My supervisor knows that some people skip steps of the standard work.
23. Sometimes my supervisor helps complete some of the standard work steps.
24. My supervisor reviews the completed paperwork/forms.
25. Sometimes my supervisor audits the standard work process during and/or after the standard work activities have been completed.
26. I follow the standard work more closely if I know my supervisor is going to audit the area.
27. I support a quality culture.
28. Management supports a quality culture.
29. My direct supervisor acts as if quality and the customer are the top priorities after safety.
30. I can stop production if there is a quality issue.
31. Sometimes the production schedule or costs are more important than quality.
32. My supervisor recently told me to save/pack product that is out of specification.
33. Suspect product (out of specification) is always held for inspection when an issue is identified.

34. I know the customer quality requirements.

Procedures

The procedure for DMAIC (Design, Measure, Analyze, Improve, and Control) was utilized in five documented phases. DMAIC was the Six Sigma technique utilized to execute the research project (Pyzdek & Keller, 2013). Define the problem was utilized to begin the project and create the survey questions. The survey instrument was validated via the pilot study. Measure phase was accomplished with the survey questions, observations, and interview responses that were used during the research and data collection. The analysis of the data collected was performed after the data was collected. Suggestions for potential improvements were based on the data analysis. Suggestions for controlling to sustain and ensure continuous improvement activities were to ensure improvement plans are created based on the data, leadership support, and resources.

As part of the DMAIC measure phase, the data were collected from multiple sites and involved: a) surveying with an opportunity to provide open-ended commentary, b) observation, and c) interviews concerning the tasks and standard work requirements. The consent information, as shown in Appendix C, was printed on the top of the survey document. The survey method utilized a paper print copy of a Microsoft Excel created document with questions formatted on a Likert scale. Step by step actions were taken to test the instruments with a pilot group. The survey questions were emailed to a subset of direct manufacturing employees for review. The researcher called the participants and reviewed the consent information verbally over the telephone. Participants printed the survey and wrote their responses along with any feedback on the questions. The participants then scanned and emailed the survey back to the researcher. The pilot study participants provided feedback on the questions. The feedback

consisted of suggesting minor wording changes to clarify the questions but not alter the intent of the questions. The feedback was direct and beneficial in ensuring the survey was straightforward and easily understood by the participants. Minor changes were made resulting in a survey less ambiguous and more straightforward to complete in minimal time.

For the face to face sample population, the paper media final survey was distributed to all participants that volunteered. The data was collected in the participants' setting. The paper surveys were provided to participants in their break areas and meeting rooms to ensure all participant targeted groups were provided the opportunity to participate. Participants' time associated for completion of the survey, observations, and interviews did not interfere with their job requirement, duties, or work performance. The consent information was reviewed and read to the potential participants. No names were collected, and only job classification information was strongly encouraged. The survey was completed by the participants and returned to the researcher. As names of participants were not collected, completion and submission of the form was the documented consent and willingness to participate.

The observations component involved the researcher watching several participants in their natural work setting performing the work that was the focal point of the study. The manufacturing areas selected for observation were associated with production steps that required employee standard work execution which could directly impact product quality. Observations consisted of monitoring the execution performance of standard work activity during normal production compared to the requirements of the quality standard.

The researcher documented observations, and the recorded notes were utilized in the research as part of the qualitative analysis conducted in NVivo. Individuals observed remained anonymous. As part of the organizations' rules of employment, all employees were regularly

observed in the production environment as part of daily site surveillance and audits. As employee observations were part of the work rules and participants were anonymous, consent for observations was not obtained as it was part of the participants' standard work requirements.

The interview method involved the participants being asked the same questions as the survey questions with more opportunity for open-ended responses. The interview participants were volunteers who met the participant survey requirements and showed interest in providing input but due to time constraints on the days of onsite data collection were not able to participate in the survey. The paper media survey with the consent information was provided to the participants for review. No names were collected, and only job classification information was strongly encouraged. The verbal interview responses to the survey questions were considered consent by the interview participants.

The data obtained for the research was securely stored and will remain as such for five years after the study was completed. All data was stored electronically on two removable storage drives. All paper copies of data have been electronically scanned and stored on the two removable storage drives. The paper copies were destroyed after the data was converted to electronic media and saved on the removable storage drives. The two storage drives are in a secure environment in the researcher's residence. The disposal and destruction of any remaining data (electronic, paper, redundant copies) will be executed after five years from completion of the study. The data files will be erased from the two removable storage drives, and the drives will be physically destroyed.

Data Collection

Data were collected from multiple sites and involved: a) surveying with an opportunity to provide open-ended commentary, b) observation, and c) interviews concerning the tasks and standard work requirements. Paper surveys were utilized with handwritten responses. Data collection was obtained from observations through notations made by the researcher at the time of the field visits. The interview responses were written by the researcher based on the participants' responses.

Participant confidentiality was maintained through the omission by the participant and by the removal of all names in both data analysis and reports. By ensuring several locations were selected along with several individuals from several locations, enough responses were obtained to prevent the singling out of any individual. Individual responses were not shared with site teams at the individual plants; however, results, where all participants in all locations were represented, were shared.

Data was managed and controlled at all times by the researcher. The participant information was coded to protect individuals from being identified. The coding of data was based on a generic number assignment for the participants that identified the location and job classification of the participant.

Data Analysis

In this qualitative method study, the failure to consistently execute standard work across multiple manufacturing locations was researched. The qualitative analysis utilized inductive and deductive data analysis (Marshall & Rossman, 2016) for a routine of comparing themes and data. The literature research provided various themes and concepts such as employee engagement, job satisfaction, leadership, and training, among others. The data collected from the different

sources were reviewed in correlation with the themes to determine if more evidence was necessary. Data saturation was reached according to O'Reilly & Parker; Walker (as cited in Fusch and Ness, 2015) when enough information was obtained to replicate the research study. To ensure data saturation was attained, the researcher executed data triangulation or the use of multiple sources of data in this case surveys, observations, and interviews to enhance the reliability of the results (Fusch & Ness, 2015). "There is a direct link between data triangulation and data saturation; the one (data triangulation) ensures the other (data saturation) ... data triangulation is a method to get to data saturation" (Fusch & Ness, 2015, p. 1411). Once it was determined that enough data was collected, a final analysis was executed.

Qualitative data were collected from multiple sites and involved: a) surveying with an opportunity to provide open-ended commentary, b) observation, and c) interviews concerning the tasks and standard work requirements. The responses for the survey located in Appendix D were tabulated utilizing a Likert-type scale from strongly disagree to strongly agree. For questions that were positive in nature, the coding was completed in ascending order with a response of strongly agree equaling a five. For questions that were negative in nature, the coding was completed in descending order with a response of strongly disagree equaling a five. Survey questions 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 16, 20, 23, 24, 25, 27, 28, 29, 30, 33, and 34 were defined by the researcher as positive in nature and survey questions 11, 12, 13, 14, 17, 19, 21, 22, 26, 31, and 32 were defined by the researcher as negative in nature. Question 18 was not coded as it was presented as an opened response. The coding allowed for the data to be quantitatively analyzed in the Minitab statistical software.

The methodology utilized for synthesizing and summarizing the survey data was deductive and inductive in relation to the themes. Deductive analysis was utilized to review

existing or predetermined patterns, relationship, and themes. For the deductive data analysis, the literature research provided various existing notions such as employee engagement, job satisfaction, leadership, and training, as potential contributors to employee standard work variance in manufacturing plants. Inductive analysis was utilized to identify new patterns, relationships, and themes in the data. As part of the inductive data analysis, information collected from the research surveys, observations, and interviews was reviewed and triangulated to determine new concepts and perceptions. The data collected from the different sources were reviewed deductively to determine what evidence supported the existing themes until enough additional evidence was collected and reviewed inductively to allow for additional theories or themes.

The overall plant customer quality performance was collected through the confidential and proprietary PFMEA methodology exercise. The number of quality complaints was obtained and those with root causes associated with standard work variance were utilized. The more complaints, the more variance in the standard work execution. The fewer complaints, the less variance or increased standard work consistency. The number of complaints was coded cardinality to facilitate comparing the standard work consistency. Each interval on the x-axis is the same size set of elements to represent standard work consistency. As any customer complaint resulting from a standard work variance regardless of size has the potential to lead to costs, recall, or customer dissatisfaction, the severity of the complaint was not factored into the standard work consistency scale. The type of standard work variance complaint was factored into the consistency scale. The more basic or quality management system foundational the standard work variance, the more significant the complaint was considered. The scale on the x-

axis was left to right with the least standard work consistency at the zero interval to the most standard work consistency at the 10 interval.

The coded data from the survey was synthesized in Minitab using the Pearson correlation tests with scatterplots providing outcomes to address the research questions. The plants with standard work consistency gaps were analyzed with the locations without standard work consistency gaps. The data were reviewed for the locations and compared to each other and overall to determine if any like variances emerged. The data from the open-ended survey questions, observations, and interviews were entered into NVivo 12 Plus software and automatically coded as well as manually coded based on nodes according to the concepts, themes, and research questions.

The data were analyzed utilizing the systematic query-based approach within the NVivo software database. Once the selection and coding of observations and interviews commenced, the researcher engaged the NVivo Word Frequency Query function and Hierarchy Chart function. The word cloud results were the visual representation of data analysis derived from the queries with the utilized parameters for both auto and manual coding of the data collected. Chapter four and Appendixes I and J have visual representations of the results of the analysis. The data from each collection method was triangulated as part of the analysis. The information that was learned from the study was shared with the organizations, participants, and provided in the dissertation.

Reliability and Validity

Reliability is the means to protect the study researcher, "...from making errors in the data collection and analysis" (Gobeille, 2013, p. 19). During the sample planning, the researcher determined an acceptable margin of error with an associated confidence level to ensure reliable results. Margin of error is the largest anticipated difference between the true population and a sample estimate of the true population ("Margin of Error," n.d.). Survey researchers commonly have an acceptable margin of error between four and eight percent at a 95% confidence level ("What Every Researcher," 2008). Sampling error is the amount of variation that may exist between the population and sample result ("What Every Researcher," 2008). A confidence level is a statistical statement that expresses the probability that the result cannot be explained only by sampling error. The research study results are reliable to within a plus or minus eight percent acceptable margin of error at the 95% confidence level. The confidence level indicates a 95% chance that if the research is repeated 100 times, 95 samples would have similar results.

Steps were undertaken to ensure the instruments utilized in this study were reliable and repeatable tools of measurement. The survey and interview questions were created based on the problem and research questions. The questions were proposed and reviewed with the dissertation committee comprised of the DBA Chair and two committee members to ensure relationship, clarity, and feasibility. The questions were then tested in a pilot study to ensure clarity and to verify the responses obtained were related to the problem and research questions.

Steps were taken to ensure the data collected was the exact data analyzed and was not corrupted when transcribed into the data collection software involved. The researcher controlled the data at all times, which provided for one person to gather and enter the data into the software. The researcher entered the data into the software. The researcher rechecked to verify the data

entered matched the data gathered. Prior to running an analysis, the researcher again verified the data entered matched the data collected. Once the analysis was completed, the data was processed a second time to validate the first analysis.

Validity, as defined by Gobeille (2013), is the means to protect the study researcher, "...from making wrong conclusions to the answers to the research questions" (Gobeille, 2013, p. 19). Internal validity analysis was double checked to ensure the values were justified and represented what was being measured. Several quality leaders in the organization were consulted to review the analysis for accuracy. External validity results were discussed with other facilities to determine if the participant equivalent employees agreed with the analysis results.

Purposive sampling sizes are determined by data saturation (Guest, Bunce, & Johnson, 2006). Data saturation is reached, according to O'Reilly & Parker 2012; Walker 2012 (as cited in Fusch and Ness, 2015), when enough information is obtained to replicate the research study and at "the point at which no new information or themes are observed in the data" (Guest, Bunce, & Johnson, 2006, p. 59). Data saturation is a means to ensure the research conducted has validity (Fusch & Ness, 2015). To ensure data saturation was attained, the researcher executed data triangulation or the use of multiple sources of data in this case surveys, observations, and interviews to enhance the reliability of the results (Fusch & Ness, 2015). Each data source was analyzed and then compared to the results of each other to determine where there was agreement and where there was incongruence. "There is a direct link between data triangulation and data saturation; the one (data triangulation) ensures the other (data saturation) ... data triangulation is a method to get to data saturation" (Fusch & Ness, 2015, p. 1411).

The content of this chapter provided the methodology utilized to perform the research to ensure the findings can be replicated. The content of this chapter addressed the dissertation

problem and the methodology utilized to perform the research. Chapter four presents the findings and results of the research methodology. The results are explicitly shown for each research question.

CHAPTER 4. RESULTS: PRESENTATION AND ANALYSIS OF THE DATA

Overview

History shows that quality performance is a significant issue in manufacturing companies across the US. There are inconsistent quality practices due to inconsistent standard work process execution decisions (Kahneman, Rosenfield, Gandhi, & Blaser, 2016). Therefore, this study researched five manufacturing plants' ability to perform consistent quality practices. The participating organizations were industry leaders of custom-made products such as electrical components and packaging containers for use across multiple markets such as automotive, food, beverage, personal care, and household. Several locations across the organizations made similar products for the same blue-chip customers. The participating organizations have work instructions detailing the requirements of tasks that need to be performed on a routine basis to reduce the risk of quality defects and ensure customer satisfaction (Manghani, 2011).

A PFMEA methodology was performed on confidential and proprietary customer complaint data from participating plants. The PFMEA reviewed all potential ways for customer complaints to be created; however, a Pareto analysis clearly showed that most root causes were tied to standard work variation. The PFMEA results were supported by the research as the survey, observation, and interview analyses revealed that standard work variation was happening. At times without formal approval, the quality system standard work was abbreviated or circumvented, and a quality defect resulted. When deviations from standard work have occurred, customer complaints and non-value-added work have generally resulted.

Despite instructions on how to perform specific manufacturing processes that would result in defect-free products (Feng & Ballard, 2008), recent customer complaints have occurred in multiple organizations and in some cases at multiple sites. The investigated customer

complaints were linked to variances in executing standard work requirements within manufacturing companies. Annually, essential training has been conducted for employees responsible for quality standard work execution. In addition, customer satisfaction results associated with zero complaints, caused by standard work variance, has been communicated. The knowledge sharing of standard work expectations and customer satisfaction levels was established to convey the need to follow the quality guidelines (Asiedu, 2015), as it has been expressed that employee engagement motivates employees not only to perform but also to go beyond job requirements (Balaji, 2014). However, even with the evidence of customer satisfaction due to standard work consistency, employees did not complete the standard work requirements as expected.

This chapter presents the research findings. Three primary research questions that guided this study were:

1. How does quality-focused manufacturing leadership influence employee standard work execution consistency?
2. How does training and accountability influence employee standard work execution consistency?
3. Do organizational culture and employee engagement factors contribute to standard work consistency?

The first research question was related to leadership in the plants. 1) How does quality-focused manufacturing leadership influence employee standard work execution consistency?

This first question was designed to obtain the necessary information in regards to the role leadership has in influencing consistent standard work execution by employees. Leadership in

this dissertation also refers to the managers and supervisors within the organizations and plants that participated in the study.

The second research question was related to the level of understanding of employees at the plants. 2) How does training and accountability influence employee standard work execution consistency? This question was designed to obtain the necessary information in regards to the expectation and the role standard work has on consistent employee performance. Training and accountability have been linked in this question. In the organizations associated with the research, individuals must be adequately trained before they are held accountable. Once an individual is trained and their knowledge verified via observation or test, they can be held responsible or accountable for executing job requirements as expected. The accountability expectation is part of the training provided to ensure understanding not only of the necessary standard work but of the expectations for execution. As such, training and accountability are a combined factor.

The third research question was focused on organizational culture and engagement factors. 3) Do organizational culture and employee engagement factors contribute to standard work consistency? The desired culture of the organizations was for the plants to have a focus on customers satisfaction and organizational success through quality products and employee engagement for high-performance results. The question was designed to understand how organizational culture and employee engagement levels impacted standard work consistency.

Culture and employee engagement are linked as employee engagement culture, "starts with an individual taking an action and making it a habit" that results in an adopted behavior that becomes ingrained and expected across the organization as part of the culture (Vragel, 2013, p. 27). The organizational culture of the manufacturing plants was based on employee engagement

for the purpose of providing quality products that meet customer expectations. Engaged employees expose the organizational culture to customers (Bellon, Estevez-Cubilete, Rodriguez, Dandy, Lane, & Deringer, 2010). Engaged employees carry out the organizational culture of providing quality products to the customer. Standard work consistency is a means to ensure that the organizational culture of performing to meet the customer's expectations is accomplished via employee engagement (Free, 2016).

Research Findings

The purpose of this qualitative case study was to increase understanding of the causes of employees' failure to comply with standard work and to develop a grounded theory to support standard work compliance across five manufacturing plant locations that operated with the same objectives for quality work standard results. The goal of the qualitative case study was to employ the grounded theory to, "... derive a general, abstract theory of a process...in the views of participants...using multiple stages of data collection" (Creswell, 2014, p. 14). Data were collected from multiple sites and involved: a) surveying with an opportunity to provide open-ended commentary, b) observation, and c) interviews concerning the tasks and standard work requirements.

Participants were manufacturing employees and leaders across three manufacturing organizations in five manufacturing plant locations that operated with the same objectives for quality work standard results. These objectives were to ensure error-free supply to customers to facilitate achieving customer loyalty, reducing costs, and improving the performance of the organization. Involvement was voluntary, and the majority of the responses did not contain personal information with participants choosing instead to remain anonymous. The surveys were

in paper format for manual completion. The observations were performed on the production floor, and the interviews utilized the survey as the foundation for the questions and discussion.

The point of view from which this problem was explored was from both the employee and the leadership perspective. The researcher worked to obtain an understanding of how the employees assigned to execute the required quality standard work made decisions to follow the standards or bypass the standards. The understanding of why standard work was not performed as expected provides leadership with the ability to adjust and make continuous improvement changes. These changes target closing the loop on standard work variances.

In this research study, method triangulation was exercised. Method triangulation according to Polit and Beck 2012 (as cited in Carter, Bryant-Lukosius, DiCenso, Alba, Blythe, & Neville, 2014) is the process of using multiple methods of data collection for the same subject. Each data source was analyzed and then compared to the results of each other to determine where there was agreement and where there was incongruence.

The significant trends or key themes in the data and information indicates quality-focused manufacturing leadership interaction and behavior significantly impacts employee adherence to standard work. Standard work consistency is directly influenced by quality-focused manufacturing leadership via training, accountability, culture, and employee engagement. This research indicates employee inconsistency of standard work execution is directly influenced by the organization leaders and how they establish and support quality expectations and culture.

This research design has resulted in a grounded theory regarding standard work consistency in a manufacturing environment. Quality-focused manufacturing leadership is responsible for organizational training, accountability, culture, and employee engagement.

These factors controlled by leadership determine the employees' motivation to execute and follow the required standard work consistently.

Major Results

The scope of this dissertation was limited to quality standard work that utilized human interaction and directly influenced customer satisfaction. The type of standard work explored in this dissertation resulted in customer complaints due to variation in execution which resulted in non-value-added costs and defects. The failure to consistently perform standard work lead to customer complaints (Manghani, 2011). Customer dissatisfaction, complaints, cost of poor quality, and loss of business resulted from standard work variances. The ISO 9000 series framework ("ISO Quality 9000," 2015) was utilized for creating, validating, and executing standard work processes.

The three primary research questions that guided this study were:

1. How does quality-focused manufacturing leadership influence employee standard work execution consistency?
2. How does training and accountability influence employee standard work execution consistency?
3. Do organizational culture and employee engagement factors contribute to standard work consistency?

The major findings of the study indicate quality-focused manufacturing leadership, training and accountability, and organizational culture and employee engagement positively correlate with standard work consistency. As variation in standard work execution increases, quality defects of products increase. As variation in standard work execution decreases, quality defects of products decrease. As the failure to consistently perform standard work lead to

customer complaints (Manghani, 2011), improvements in quality-focused manufacturing leadership, training and accountability, and organizational culture and employee engagement will increase standard work consistency and reduce customer dissatisfaction.

Pilot Study

A pilot study was completed for the survey tool. The goal of the pilot study was to determine if the questions proposed were clear and facilitated the effective collection of participants' opinions. The pilot study functioned as a model for the planned data collection. The survey was reviewed for comprehension and linkage to the research questions. The pilot study consisted of 21 participants as shown in Table 7. The pilot participants were from the three of the five plants associated with the case study as indicated in Table 7. The recommended number of participants for a pilot study is 12 (Moore, Carter, Nietert, & Stewart, 2011). As such the sample size of this pilot study was comparable to other qualitative studies and ensured a robust number of employees who performed the standard work were solicited.

Table 7

Survey Pilot Sample Population by Plant and Participant Category

<u>Plant Location</u>	<u>Pilot Sample Population Employees</u>	<u>Pilot Sample Population Leaders</u>
Pennsylvania 1	6	6
California	5	0
Kentucky	3	1
Totals (N = 21)	14	7

Note. Employees represent hourly participants and Leaders represent salary participants.

Pilot study participants provided feedback on the questions. The feedback consisted of suggesting minor wording changes to clarify the questions but not alter the intent of the questions. The feedback was direct and beneficial in ensuring the survey was straightforward and easily understood by the participants. Minor changes were made resulting in a survey less ambiguous and more straightforward to complete in minimal time.

Appendix E, Pilot Study Results, contains scatterplot graphs and Pearson Correlation results created from Minitab statistical software analysis of the pilot study survey responses. Each scatterplot graph displays a pilot survey question associated with the research question. The goal of the pilot study was to determine if the survey questions were clear and facilitated the effective collection of participants' opinions. The pilot survey results showed positive correlations with quality-focused manufacturing leadership, training and accountability, and organizational culture and employee engagement factors with standard work execution consistency.

Data Collection

Data were collected from multiple sites and involved: a) surveying with an opportunity to provide open-ended commentary, b) observation, and c) interviews concerning the tasks and standard work requirements. Employee meetings were held at the respective manufacturing plants for the purpose of inviting participants to participate in the research. During the employee meetings, the survey intent along with the research goal of exploring the causes of inconsistent quality performance was shared. The research objectives, survey disclosure, and informed consent information was shared with participants. It was made clear that participation was voluntary, participants could elect to remain anonymous, and there would be no direct benefits

provided to the participants. A total of 200 surveys were distributed, and 178 were returned and utilized for the data analysis.

The selection criteria for participants required that their job function utilized standard work associated with customer product quality. The participants were members of four manufacturing plants where variance in standard work execution has resulted in multiple personnel error-created customer complaints; as well as, members of one manufacturing plant where consistent standard work execution has resulted in zero personnel error-created customer complaints. The total population included all individuals in the five participating plants whose job function required standard work execution that directly impacted product quality.

Participants that were included in the survey, observations, and interviews were hourly production operators, quality inspectors, and end of line associates responsible for performing the quality standard work as well as salary participants who were the supervisors, managers, and leaders of the participants who were responsible for executing the standard work requirements.

During the sample planning, the researcher also determined an acceptable margin of error with an associated confidence level to ensure reliable results. Margin of error is the largest anticipated difference between the true population and a sample estimate of the true population ("Margin of Error," n.d.). Survey researchers commonly have an acceptable margin of error between four and eight percent at a 95% confidence level ("What Every Researcher," 2008). Sampling error is the amount of variation that may exist between the population and sample result ("What Every Researcher," 2008). A confidence level is a statistical statement that expresses the probability that the result cannot be explained only by sampling error. As shown in Table 8, the research study results are reliable to within a plus or minus eight percent

acceptable margin of error at the 95% confidence level. The confidence level indicates a 95% chance that if the research is repeated 100 times, 95 samples would have similar results.

Table 8

Margin of Error by Participant Category at a 95% confidence level

<u>Plant Location</u>	<u>% Margin of Error</u>		
	Sample Population Total	Sample Population Employee	Sample Population Leader
Pennsylvania 1	6%	8%	0%
California	0%	0%	0%
Kentucky	7%	8%	0%
Pennsylvania 2	5%	5%	10%
Pennsylvania 3	5%	6%	0%
Over % Margin of Error	3%	3%	4%

Note. % Margin of Error calculated using (Pollfish, 2018).

In addition to the surveys completed, the researcher also completed 10 observations by witnessing standard work activities in the plant manufacturing areas. The manufacturing areas selected for observation were associated with production steps that required employee standard work execution which could directly impact product quality. Observations consisted of monitoring the execution performance of standard work activity during normal production compared to the requirements of the quality standard. Observations were documented and entered into the NVivo 12 Plus software for analysis.

A total of 10 interviews were conducted. The 10 interviews utilized the survey questions as the foundation of the interview. Once the survey questions were answered, the interviewee was allotted an opportunity to expand upon the responses. The interview participants were

volunteers who met the participant survey requirements and showed interest in providing input but due to time constraints on the days of onsite data collection were not able to participate in the survey. The responses from the interviews were analyzed and then compared to the results of the survey responses and observation analyses to determine where there was agreement and where there was incongruence.

Demographics

This research explored the causes of inconsistent quality performance across three manufacturing organizations in five plant locations that operated with the same objectives for quality work standard results. The organizations that participated in the survey were located throughout the United States of America. The participating organizations were industry leaders of custom-made products such as electrical components and packaging containers for use across multiple markets such as automotive, food, beverage, personal care, and household. Several locations across the organizations made similar products for the same blue-chip customers. The standard work activities required different standard work instructions. The research was not dependent on the type of products manufactured or the actual standard work activities and instructions.

As the participants were to remain anonymous, minor amounts of demographic information were provided. Overall the population within the organizations was mostly male, and all participants were full-time associates of the organizations. The participants provided their plant location, the job classification of hourly employee or salary leader, and as shown in Table 9, the number of years of experience with the organization. The level of customer satisfaction based on quality complaints with standard work variance as the root cause of the complaint was relevant.

Table 9

Survey Sample Population - Years of Experience with Organization

<u>Plant Location</u>	<u>Experience – Employee</u>					
	<u>≤ 1 Year</u>	<u>1-5 Years</u>	<u>6-15 Years</u>	<u>16-25 Years</u>	<u>26+ Years</u>	<u>Not Disclosed</u>
Pennsylvania 1	2	5	7	8	0	0
California	0	2	4	4	2	0
Kentucky	18	8	1	5	0	0
Pennsylvania 2	16	11	7	6	1	12
Pennsylvania 3	24	3	2	0	0	0
Total n=148	60	29	21	33	3	12

<u>Plant Location</u>	<u>Experience – Leader</u>					
	<u>≤ 1 Year</u>	<u>1-5 Years</u>	<u>6-15 Years</u>	<u>16-25 Years</u>	<u>26+ Years</u>	<u>Not Disclosed</u>
Pennsylvania 1	0	0	6	0	0	0
California	0	0	1	2	0	0
Kentucky	0	2	2	1	0	0
Pennsylvania 2	1	2	1	3	1	2
Pennsylvania 3	4	1	1	0	0	0
Total n=30	5	5	11	6	1	2

Note. Information obtained from the survey.

Survey Results

The instruments that were utilized to collect the qualitative data were created for three basic methods which were surveying, observing, and interviewing. The first method was a Likert scale-based survey with questions utilized for several participants (Biddix, 2009). The survey instrument was created based on the research questions.

Research Question One

How does quality-focused manufacturing leadership influence employee standard work execution consistency? Figures 3 and 4 display the scatterplot graphs based on survey questions 1, 14, 21, 22, 23, 24, 25, 30, 31, and 32 which address research question one. Survey questions:

1. My supervisor gives me ongoing feedback that helps me improve my performance.
14. Standard work steps are skipped because there is not enough time to do all of them.
21. My supervisor told me to stop doing the steps of the standard work.
22. My supervisor knows that some people skip steps of the standard work.
23. Sometimes my supervisor helps complete some of the standard work steps.
24. My supervisor reviews the completed paperwork/forms.
25. Sometimes my supervisor audits the standard work process during and/or after the standard work activities have been completed.
30. I can stop production if there is a quality issue.
31. Sometimes the production schedule or costs are more important than quality.
32. My supervisor recently told me to save/pack product that is out of specification.

The data shows quality-focused manufacturing leadership is positively correlated with standard work execution from both the employee and leader responses. Organizations with low-quality complaint levels and supportive manufacturing leaders have robust adherence to standard

work execution. As leadership support and engagement levels increase, standard work execution consistency increases and related customer satisfaction increases as quality complaints due to standard work variances decrease. The scatterplot correlation graphs in Figure 3 display the Employee responses, and Figure 4 display the Leader responses. Appendix F provides the Pearson Correlation and P Values which display the results of quality-focused manufacturing leadership positively correlated with standard work consistency.

Figure 3. Employee Sample Population - Research Question One – Quality-focused Manufacturing Leadership

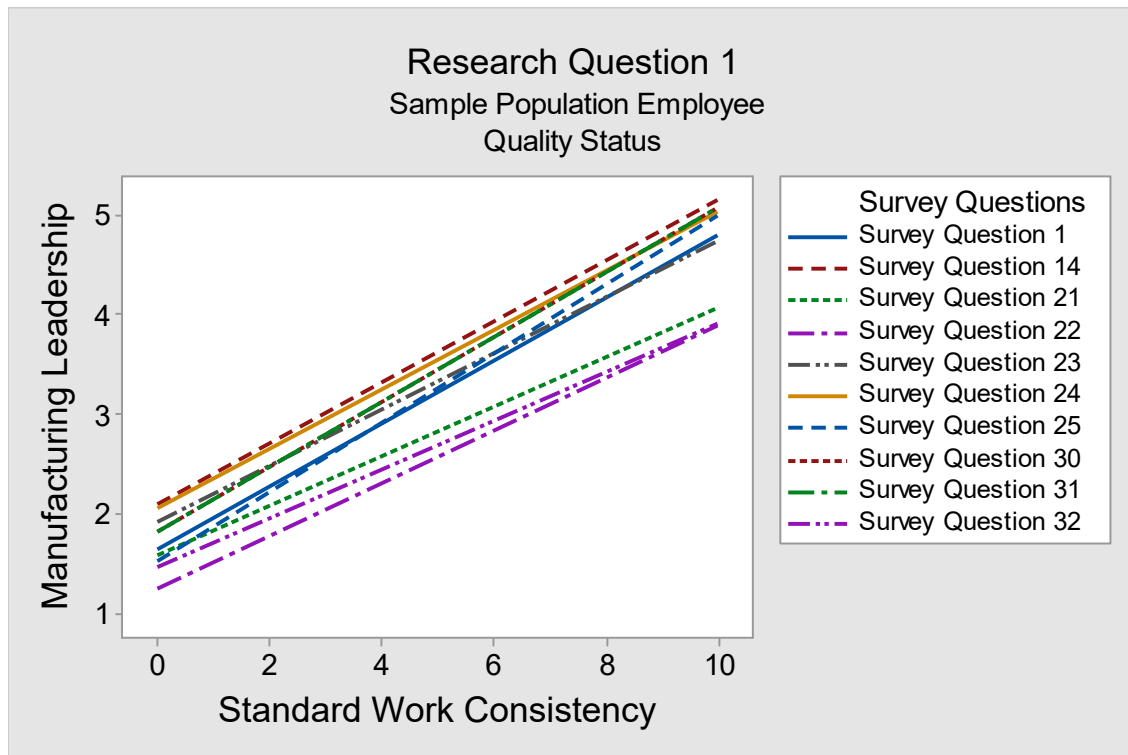


Figure 3. Scatterplot graph of the employee sample population for survey question responses associated with research question one. This figure illustrates that quality-focused manufacturing leadership is positively correlated with employee standard work execution.

Figure 4. Leader Sample Population - Research Question One – Quality-focused Manufacturing Leadership

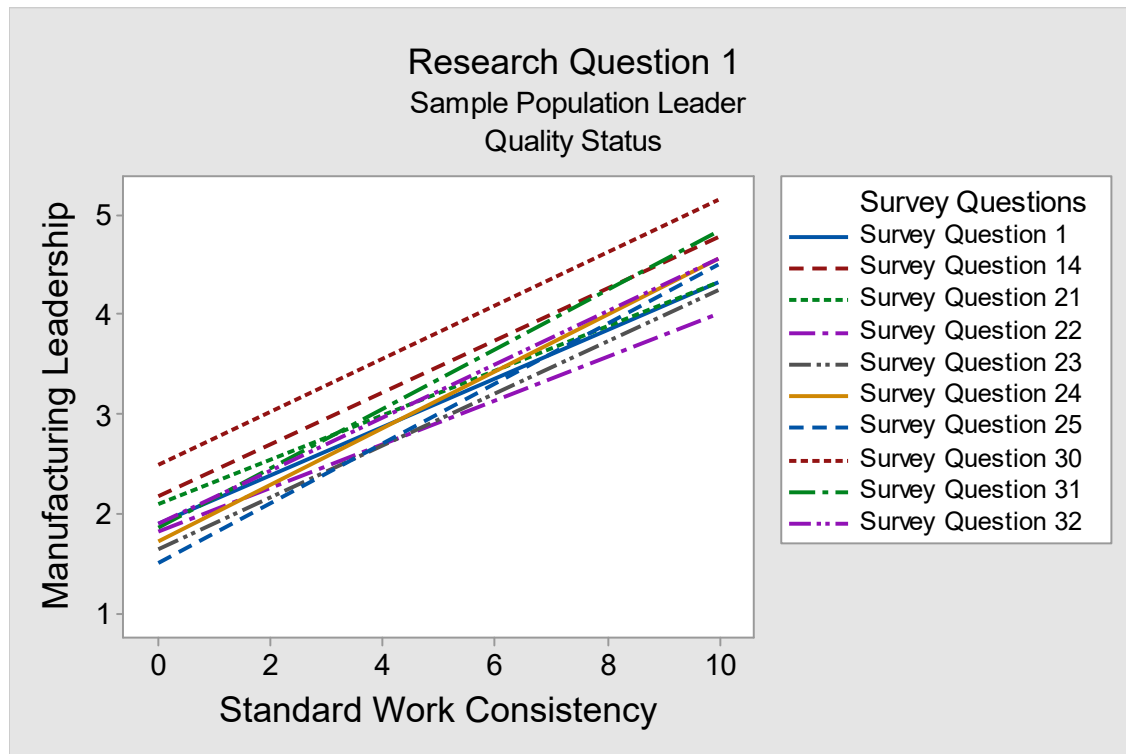


Figure 4. Scatterplot graph of the leader sample population for survey question responses associated with research question one. This figure illustrates that quality-focused manufacturing leadership is positively correlated with employee standard work execution.

In both Figure 3 and Figure 4, the y-axis represents the survey responses associated with quality-focused manufacturing leadership. The x-axis displays quality performance levels from low to high based on quality standard work consistency. Each associated survey question linked to the research question is listed in the legend and has a unique color and line sequence pattern. Figure 3 indicates that quality-focused manufacturing leadership positively correlates with consistent employee adherence of standard work from the employees' perspective. Figure 4 indicates that quality-focused manufacturing leadership positively correlates with consistent

employee adherence of standard work from the leaders' perspective. These results indicate that the more involved and supportive the leaders are the better the employee adherence to quality standard work execution.

Quality-focused manufacturing leadership focuses on achieving customer satisfaction by providing products and services that meet established expectations and provides a work environment that positively influences standard work execution consistency. Supportive leadership that believes in quality management systems and structured work processes provides employees with the knowledge and tools necessary to execute standard work consistently. Resilient, consistent, and supportive leadership provides the foundation for consistent standard work execution.

Based on the survey data, quality-oriented manufacturing leadership positively correlates with standard work and years of experience with the organization. Appendix F displays the scatterplot which indicates the tenure of leaders and employees positively correlates with quality-focused manufacturing leadership and standard work consistency. As the years of experience increases so does quality-focused manufacturing leadership in impacting standard work adherence from both a leader and employee perspective. In addition, quality-focused manufacturing leadership influence of standard work consistency for both employees and leaders positively correlate with the maturity of the manufacturing plant. The more mature the plant, the more consistent quality-focused manufacturing leadership is in relation to standard work execution. These scatterplots from both employees and leaders are also displayed in Appendix F.

Research Question Two

How does training and accountability influence employee standard work execution consistency?

Training and accountability have been linked in this question. In the manufacturing plants associated with the research, individuals must be adequately trained before they are held accountable. Once an individual is trained and their knowledge verified via observation or test, they can be held responsible or accountable for executing job requirements as expected.

Figures 5 and 6 display the scatterplot graphs based on survey questions 2, 3, 5, 6, 8, 9, 10, 11, 12, 13, 17, 19, 26, and 33 which addresses research question two. Survey questions:

2. My supervisor holds me accountable for performance.
3. My supervisor holds my co-workers accountable for performance.
5. I received training on the standard work for my job.
6. I understand my responsibilities in executing standard work.
8. I understand how to execute the standard work requirements.
9. My co-workers know how to execute the standard work requirements.
10. I know where to find the standard work requirements, for example, the work instruction or form for completion.
11. Sometimes, I skip steps of the standard work.
12. I skip steps because I do not know how to do them.
13. I skip steps because I do know how to do them.
17. Standard work steps are skipped because some steps are not needed.
19. If standard work process steps are skipped, no one will comment or say anything.

26. I follow the standard work more closely if I know my supervisor is going to audit the area.

33. Suspect product (out of specification) is always held for inspection when an issue is identified.

The data shows training and accountability is positively correlated with standard work execution from both the employee and leader responses. Organizations with low-quality complaint levels and appropriate training with accountability requirements have robust adherence to standard work execution. As training and accountability measures increase or become more relevant, standard work execution consistency increases and related customer satisfaction increases as quality complaints due to standard work variances decrease. The scatterplot correlation graphs in Figure 5 display the Employee responses, and Figure 6 display the Leader responses. Appendix G provides the Pearson Correlation and P Values which display the results of training and accountability positively correlated with standard work consistency.

Figure 5. Employee Sample Population - Research Question Two – Training and Accountability

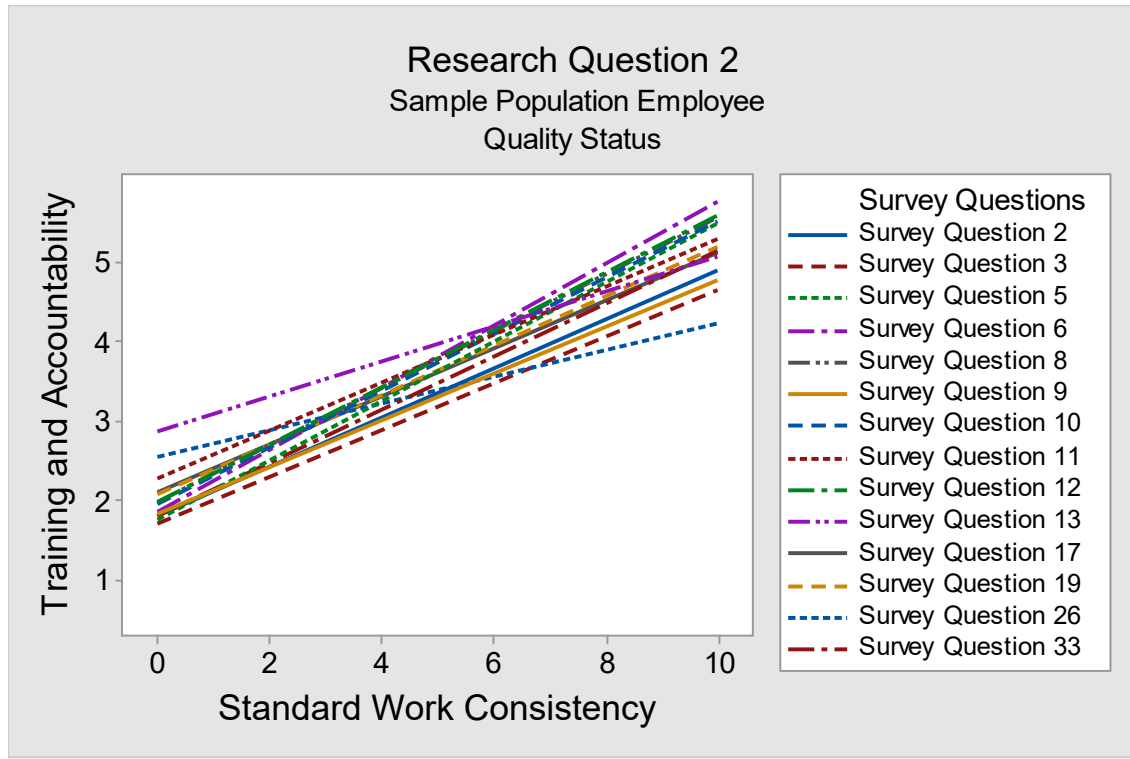


Figure 5. Scatterplot graph of the employee sample population for survey question responses associated with research question two. This figure illustrates that training and accountability are positively correlated with employee standard work execution.

Figure 6. Leader Sample Population - Research Question Two – Training and Accountability

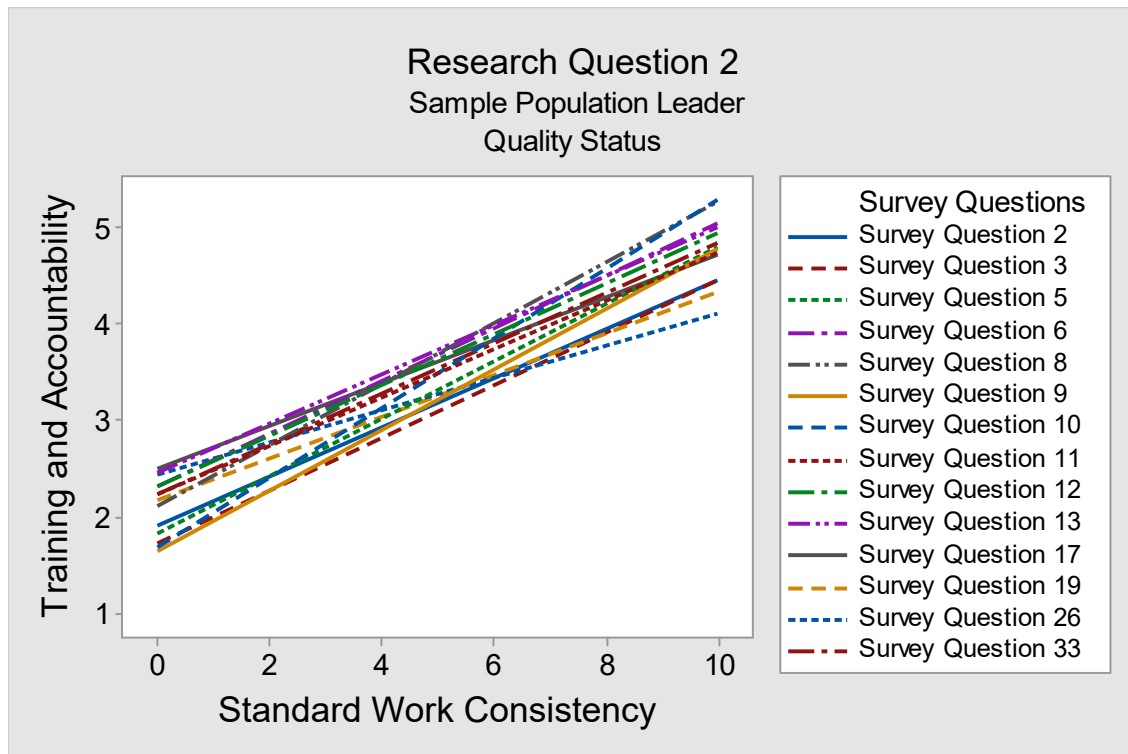


Figure 6. Scatterplot graph of the leader sample population for survey question responses associated with research question two. This figure illustrates that training and accountability are positively correlated with employee standard work execution.

In both Figure 5 and Figure 6, the y-axis represents the survey responses associated with training and accountability. The x-axis displays quality performance levels from low to high based on quality standard work consistency. Each associated survey question linked to the research question is listed in the legend and has a unique color and line sequence pattern. Figure 5 indicates that training and accountability positively correlate to consistent employee adherence of standard work from the employees' perspective. Figure 6 indicates that training and accountability positively correlate to consistent employee adherence of standard work from the leaders' perspective. These results indicate that as the levels of training and associated

accountability are increased, the better the employee adherence to the quality standard work execution.

Thus, this research indicates manufacturing organizations that take the time and expend resources to provide training on standard work requirements have a higher level of performance consistency. Organizations support training by verifying knowledge and execution through accountability. Accountability is the employees' obligation to accept responsibility for one's actions ("Accountability," 2018). Ownership of actions for standard work execution results in low amounts of quality defects. Examples of such accountability consist of supervisors counseling individuals for circumventing standard work without cause. Accountability measures such as discipline must be taken when employees who have been trained with comprehension verified take actions that are not aligned or consistent with standard work requirements. Prior to determining what if any accountability actions are to be taken, leaders must investigate and understand why the employee made the decision to deviate from the standard work. The data indicate that training and accountability positively correlate with standard work performance consistency and reduced customer complaints.

Based on the survey data, training and accountability positively correlate with standard work and years of experience with the organization. Appendix G displays the scatterplot which indicates the tenure of employees and leaders positively correlates with training and accountability and standard work consistency. As the years of experience increases so does training and accountability in impacting standard work adherence from both an employee and leader perspective. In addition, training and accountability influence of standard work consistency for both employees and leaders positively correlate with the maturity of the manufacturing plant. The more mature the plant, the more consistent training and accountability

is in relation to standard work execution. These scatterplots from both leaders and employees are also displayed in Appendix G.

Research Question 3

The desired culture of the organizations was for the plants to have a focus on customers satisfaction and organizational success through quality products and employee engagement for high performance results. The question was designed to understand how the culture and employee engagement levels impacted standard work consistency. Culture and employee engagement are linked as employee engagement culture, "starts with an individual taking an action and making it a habit" that results in an adopted behavior that becomes ingrained and expected across the organization as part of the culture (Vragel, 2013, p. 27).

Do organizational culture and employee engagement factors contribute to standard work consistency? Figures 7 and 8 display the correlation graph based on survey questions 4, 7, 15, 16, 20, 27, 28, 29, and 34 addresses research question three. Survey questions:

4. I understand how my work directly contributes to the overall success of my company.
7. I understand "why" the standard work is important.
15. I will notify my supervisor when there is something missing from the standard work.
16. I will notify my supervisor when there is something incorrect in the standard work.
20. I let my supervisor know if I cannot perform all of my standard work.
27. I support a quality culture.
28. Management supports a quality culture.
29. My direct supervisor acts as if quality and the customer are the top priorities after safety.
34. I know the customer quality requirements.

The organizational culture of the manufacturing plants was based on employee engagement for the purposes of providing quality products that meet customer expectations. Engaged employees expose the organizational culture to customers (Bellon, Estevez-Cubilete, Rodriguez, Dandy, Lane, & Deringer, 2010). Engaged employees carry out the organizational culture of providing quality products to the customer. Standard work consistency is a means to ensure that the organizational culture of performing to meet the customer's expectations is accomplished via employee engagement (Free, 2016).

The data indicates organizational culture and employee engagement is positively correlated with employee adherence to standard work. The more focused the organizational culture and employee engagement factors, the more consistent the employee adherence to the quality standard work execution. An increase in the organizational culture focused on employee engagement will, in turn, correlate to an increased in standard work execution consistency.

Figure 7. Employee Sample Population - Research Question Three – Organizational Culture and Employee Engagement



Figure 7. Scatterplot graph of the employee sample population for survey question responses associated with research question three. This figure illustrates that organizational culture and employee engagement is positively correlated with employee standard work execution.

Figure 8. Leader Sample Population - Research Question Three – Organizational Culture and Employee Engagement

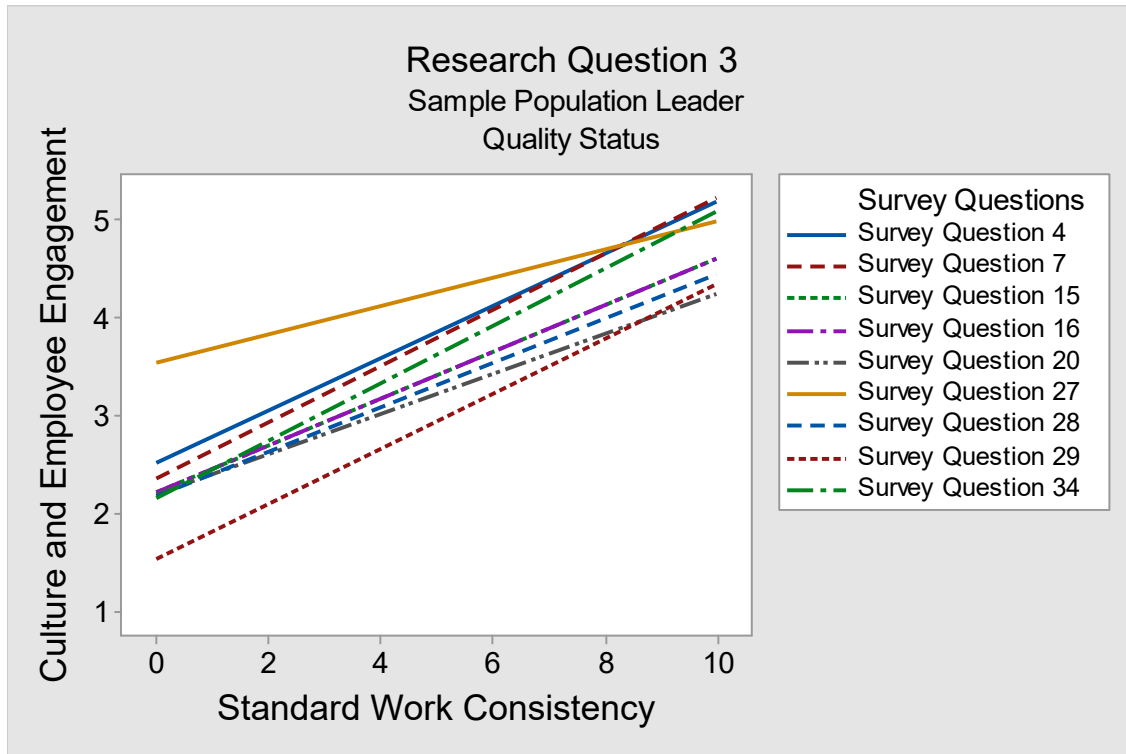


Figure 8. Scatterplot graph of the leader sample population for survey question responses associated with research question three. This figure illustrates that organizational culture and employee engagement is positively correlated with employee standard work execution.

In both Figure 7 and Figure 8, the y-axis represents the survey responses associated with organizational culture and employee engagement. The x-axis displays quality performance levels from low to high based on quality standard work consistency. Each associated survey question linked to the research question is listed in the legend and has a unique color and line sequence pattern. Figure 7 indicates that organizational culture and employee engagement factors positively correlate with consistent employee adherence to standard work from the employees' perspective. Figure 8 indicates that organizational culture and employee engagement

factors positively correlate with consistent employee adherence to standard work from the leaders' perspective. These results indicate that as organizational culture and employee engagement increases, quality standard work consistency increases.

The researcher utilized the survey information to perform correlation studies on years of experience with the organization and plant stage of development or tenure. The scatterplots of this analysis can be found in Appendices G, H, and I per the respective research questions. Additional analysis indicates years of experience positively correlates with standard work consistency for all research questions factors and sample populations. The plant stage of development also positively correlates with standard work consistency for all research questions factors and sample populations.

The Pearson correlation is utilized to examine the linear relationship between variables (Minitab Express Support, 2017). Within a coefficient range of -1 to +1, the larger the absolute value of the coefficient the stronger the relationship between variables (Minitab Express Support, 2017). When the variables increase or decrease together, the coefficient is positive and has an upward line slope on the scatterplot graph. The results of the research indicate the variables studied are positively correlated with standard work consistency. In addition to the Pearson correlation which indicates the linear relationship, the p-value determines if the correlation coefficient is statistically significant (Minitab Express Support, 2017). When the p-value is less than or equal to the significance level, the correlation is statistically significant (Minitab Express Support, 2017). The significance level utilized in this study was 0.05. The Pearson correlation coefficient along with the p-value for each of the survey questions and variables are in Appendices F, G, and H per the respective research questions.

Employee performance consists of, “executing defined duties, meeting deadlines, employee competency, and effectiveness and efficiency in doing work” (Iqbal, Anwar, & Haider, 2015, p. 2). Increased understanding of the causes associated with failure to meet expectations has provided knowledge on how to address quality standard work performance gaps within organizations. This qualitative method research contributed to the Quality System Management body of knowledge, as there was a gap in information as to how leadership, training, accountability, organizational culture, and employee engagement factors contributed to employee performance regarding standard work compliance.

Based on the survey data, organizational culture and employee engagement positively correlate with standard work and years of experience with the organization. Appendix H displays the scatterplot which indicates the tenure of leaders and employees positively correlates with organizational culture and employee engagement and standard work consistency. As the years of experience increases so does organizational culture and employee engagement in impacting standard work adherence from both a leader and employee perspective. In addition, organizational culture and employee engagement influence of standard work consistency for both employees and leaders also positively correlated with the maturity of the manufacturing plant. The more mature the plant, the more consistent quality-focused manufacturing leadership is in relation to standard work execution. These scatterplots from both employees and leaders are also displayed in Appendix H.

Observation and Interview Results

In addition to the surveys completed, the researcher also completed 10 observations by witnessing standard work activities in the plant manufacturing areas. The manufacturing areas selected for observation were associated with production steps that required employee standard work execution which could directly impact product quality. Observations consisted of monitoring the execution performance of standard work activity during normal production compared to the requirements of the quality standard. Observations focused on the execution of standard work by employees with the tools and instructions obtained from the leaders. Observations were documented and entered into the NVivo 12 Plus software for analysis.

A total of 10 interviews were conducted, six with leaders and four with employees. The 10 interviews utilized the survey questions as the foundation of the interview. Once the survey questions were answered, the interviewee was allotted an opportunity to expand upon the responses. The interview participants were volunteers who met the participant survey requirements and showed interest in providing input but due to time constraints on the days of onsite data collection were not able to participate in the survey. The responses from the interviews were analyzed and then compared to the results of the survey responses and observation analyses to determine where there was agreement and where there was incongruence.

After the survey questions associated with the respective research questions were analyzed, the data collected from the observation and interview information was analyzed. Information collected from the open-ended commentary section of the survey, observation notes, and interview responses was entered into NVivo 12 Plus computer software by QSR International. All commentary and notes were coded both automatically and manually for

analysis. Automatic coding was created based on observation and interview responses. The manual coding was created based on identifying quality-focused manufacturing leadership, training and accountability, and organizational culture and employee engagement factors associated with the standard work level of consistency.

Word Frequency Queries were performed with both automatic and manual coded data provided by the observations and interviews. The word cloud displayed in Figures 9, 10, and 11 and Appendix I provides the results indicating common themes and factors associated with standard work. Figure 9 is the word frequency cloud for the observation data that was collected in the manufacturing plant. The more prominent the word, the more often it appears in the observation data. The interpretation is that quality standard work is found during the production of customer products and supported by leadership (supervisor) and employees (employee engagement), with training of documented expectations.

Additional word frequency cloud results for both auto and manual generated coding are in Appendix I and display similar word frequency clouds. Further analysis was completed with the NVivo auto coding feature. Hierarchy charts were generated. The charts support the results of the word frequency clouds with similar themes and actions appearing in the coded results. The hierarchy charts can be found in Appendix J.

Triangulation

In this research study, method triangulation was exercised. Method triangulation according to matter Polit and Beck 2012 (as cited in Carter, Bryant-Lukosius, DiCenso, Alba, Blythe, & Neville, 2014) is the process of using multiple methods of data collection for the same subject. Each data source was analyzed and then compared to the results of each other to determine where there was agreement and where there was incongruence.

Triangulating the data was executed utilizing the survey results and the word frequency queries, and the hierarchy charts for both the observations and interviews. The researcher reviewed the Pearson correlation results which identified an overall positive correlation with standard work execution consistency and quality-focused manufacturing leadership, training and accountability, and organizational culture and employee engagement. In addition, the survey analysis indicated a positive correlation existed when the year of experience with the organization was included. The same was found with the maturing of the facility or years of operating. The finding was found to be consistent for both the employee sample population and the leader sample populations.

The analysis of the observations and interviews using the word frequency queries supports the finding that standard work execution consistency is related to quality-focused manufacturing leadership, training and accountability, and organizational culture and employee

engagement. The word frequency clouds displayed in Figures 9, 10, and 11 along with Appendix I provides the results of observations and interviews both individually and combined. The themes indicated from both NVivo auto coding and researcher manual coding are consistent with the survey results as shown in the word frequency clouds. The analysis indicated the themes associated with standard work at high, medium, and low levels of standard work execution consistency. The themes identified in the various word frequency queries are consistent as shown in the word frequency cloud figures.

Hierarchy charts generated from auto coded observation and interview data provided additional support to the findings from the Pearson correlation and word frequency clouds. Appendix J contains three charts. Figure J1 is the hierarchy chart for a combination of both observation and interviews auto coded data, Figure J2 is the hierarchy chart for the auto coded observations, and Figure J3 is the hierarchy chart for the auto coded interviews. The auto coded output provided in the hierarchy charts reflects the same general themes identified in the research questions via the survey, observations, and interviews.

The significant trends or key themes in the data and information indicates quality-focused manufacturing leadership interaction and behavior significantly impacts employee adherence to standard work. Standard work consistency is directly influenced by quality-focused manufacturing leadership via training and accountability, and organizational culture and employee engagement. This research indicates employee inconsistency of standard work execution is directly influenced by the organization leaders and how they establish and support quality expectations and culture.

Grounded Theory

The research through the triangulation of data produced a grounded theory based on social structure and human behavior insights. Grounded theory is executed when a topic has little research documented as is the case for standard work consistency in manufacturing (Ivey, 2017). The grounded theory is developed inductively from data gathered (Flick, 2018). "The design of the research is focused on the research questions, rather than on testing a hypothesis" (Ivey, 2017, p. 288). The core conventions of developing a grounded theory are several. The researcher is to remain objective and avoid preconceived beliefs regarding the subject, subjects, and culture (Ivey, 2017). The formal grounded theory considers the variations in both data and conditions (Flick, 2018).

Denscombe 2014 provided three principles (as cited in Harris, 2015) that distinguish the grounded theory. Principle one is theory construction to describe what is occurring. Principle two is the theory creation based on empirical research without bias focused on fieldwork and real-life data collection. Principle three is parallel and methodical data collection and analysis. Data is used to generate theory and hypotheses to explain the behavior identified in the research per Stern & Porr 2011 (as cited in Ivey, 2017). The outcome is a logical product based on the research.

Based on the triangulation of the survey, observation, and interview data, the employee research participants are significantly influenced by leadership actions. The failure to adhere to quality standard work is tied to the actions and support of leadership and not related to employees working to circumvent the quality standard work system. One reason for the inconsistencies is that leadership within organizations are not devoted to adopting quality techniques which influence performance (Gambi, Boer, Gerolamo, Jorgensen, & Carpinetti,

2015). A grounded theory emerged from the triangulation that leadership directly influences and has a positive correlation with an employee's ability to consistently perform to the standard work expectations. Which validates consistent execution of standard work is directly correlated with leadership.

Synthesis and Summary of Data

This research design has resulted in a grounded theory regarding standard work consistency in a manufacturing environment. The grounded theory that emerged from the study is leadership directly influences and has a positive correlation with an employee's motivation to consistently perform to the standard work expectations. Leadership that values and commits resources such as time and tools to support the training or knowledge sharing of standard work requirements enhances employee engagement and participation. Employees do not purposely deviate from standard work requirements. Leadership that is not supportive and does not provide the mechanism for fair accountability contributes to employees' inability to follow expected standard work requirements properly.

The analysis determined that a positive correlation exists between quality-focused manufacturing leadership and standard work consistency. The themes of quality-focused manufacturing leadership, training, accountability, culture, and employee engagement all have a positive correlation to employee performance in consistently executing standard work requirements. When quality-focused manufacturing leadership is not aligned and supportive of creating a culture that focuses on customer product quality, standard work consistency is negatively impacted. The lack of leadership support also undermines and prevents effective training and accountability measures. The overall lack of employee engagement creates an

environment where standard work execution is not fully supported by leadership. The quality of the customer product is compromised when standard work variance occurs.

Based on the results of the survey, observations, and interview analysis, standard work consistency positively correlated with quality-focused manufacturing leadership, training and accountability, and organizational culture and employee engagement. These factors govern, control, and influence employee quality standard work execution consistency. Organizations that increase focus on interactive leadership to promote a quality culture which supports employee engagement, and training with accountability observe increases in the execution of employee standard work consistency. Organizations with low levels of focused leadership on promoting a quality culture that does not support employee engagement, training, or accountability provide an environment for inconsistent execution of standard work.

Contribution to Applied Practice

The research utilized a qualitative method applied to execute the research associated with the dissertation. The qualitative approach was a case study that employed a grounded theory to, "... derive a general, abstract theory of a process...in the views of participants...using multiple stages of data collection" (Creswell, 2014, p. 14). A paradigm worldview of constructivist combined with interpretivism, supported understanding the connotations that social actions have for the people researched (Zhou, 2012). The research assumptions of epistemology provided for the inclusion of the human element interpretation through study and field observations (Bunge, 1983).

The Social Cognitive Theory of human functioning developed in the 1980s by Albert Bandura (Pajares, 2004) was applied. A data triangulation approach was applied to the data sources (Creswell, 2014). The survey, observation notes, and interview responses were

triangulated using Version 18 of Minitab (2017) and Version 12 Plus of NVivo (2018) analytical tools. A grounded theory (Creswell, 2014) based on the social structure and human behavior insights were developed.

The quality management model utilized for this study was the ISO quality management standards ("ISO Quality 9000," 2015). The ISO 9000 series framework ("ISO Quality 9000," 2015) is utilized for creating, validating, and executing standard work processes. The standard work was developed to align with the ISO 9000 requirements. The work instructions were developed to align with driving the culture to focus on the customer and product quality. Standard work variation indicates a systemic issue with the quality management system. The ability to define the root cause of standard work variation provides for an organization to make improvements and improve employee performance.

In addition to ISO standards, a Process Failure Mode and Effect Analysis (PFMEA) methodology were employed to validate the quality issues were related to variation in standard work adherence. The root cause for customer quality complaints was linked to variation in standard work execution. The PFMEA process assisted in identifying standard work variance as the reason for low-quality performance. The dissertation applied the Six Sigma Define, Measure, Analyze, Improve, and Control (DMAIC) model (Pyzdek & Keller, 2013) to ensure the completion of a cohesively executed project and dissertation. The researched incorporation of the plan, do, check, and act (PDCA) cycle (Pyzdek & Keller, 2013) and ensured the DMAIC steps were followed for a cohesively executed dissertation.

The first phase was to define the problem with assistance from the PFMEA. The second phase was to measure using literature reviews, surveys, observations, and interviews. The third phase was to analyze the data collected with Minitab and NVivo software. The improve phase s

followed by making suggestions for potential improvement. Finally, the last phase of DMAIC was to control the message of the results and make suggestions for future research.

This research identified that standard work consistency is significantly influenced by quality-focused manufacturing leadership. Quality-focused manufacturing leadership drives organizational culture and employee engagement. Variance in employee engagement is caused by leadership; in turn, employees are three times more engaged when leaders communicate with them on a regular basis (Pollock, 2016). Quality-focused manufacturing leadership is also responsible for providing and supporting training. Employees that are provided effective training can be held accountable by quality-focused manufacturing leadership for job execution.

Employees are not intentionally circumventing standard work requirements. Employees strive to perform but are not consistently provided the knowledge, resources, support, tools, and leadership to be successful. Quality-focused manufacturing leadership is responsible for all aspects of employee productivity and performance. As such, standard work consistency can be greatly improved by quality-focused manufacturing leadership providing the necessary attention to training with accountability and organizational culture focused on employee engagement.

Quality-focused manufacturing leaders who embrace and understand the level of influence they have on employee standard work execution consistency can significantly impact performance. When quality-focused manufacturing leadership interacts with employees and provides the necessary support, employee performance increases, standard work consistency increases, and organizational performance increases. Practitioners who seek to improve quality performance must increase quality-focused manufacturing leadership interaction and support with employees.

The content of this chapter presents the findings and results of the research methodology. The results have been explicitly shown for each research question. The grounded theory that emerged from the study is leadership directly influences and has a positive correlation with an employee's motivation to consistently perform to the standard work expectations. Chapter 5 consists of a discussion of the results, the implications of the results, and evidence-based recommendations for further addressing the problem.

CHAPTER 5. DISCUSSION, IMPLICATIONS, RECOMMENDATIONS

Overview

History shows that quality performance is a significant issue in manufacturing companies across the US. There are inconsistent quality practices due to inconsistent standard work process execution decisions (Kahneman, Rosenfield, Gandhi, & Blaser, 2016). Therefore, this study researched a total of five manufacturing plants' ability to perform consistent quality practices from three organizations. Four of the five plant locations had customer complaints associated with variation in the execution of quality standard work requirements. Of these four plants, three were located in Pennsylvania, and one was located in Kentucky. The fifth plant located in California had zero complaints associated with standard work as the location had consistent standard work execution. The participating organizations were industry leaders of custom-made products such as electrical components and packaging containers for use across multiple markets such as automotive, food, beverage, personal care, and household. Several locations across the organizations made similar products for the same blue-chip customers.

The participating organizations have work instructions detailing the requirements of tasks that need to be performed on a routine basis to reduce the risk of quality defects and ensure customer satisfaction (Manghani, 2011). At times without formal approval, the quality system standard work was abbreviated or circumvented, and a quality defect has resulted. When deviations from standard work have occurred, customer complaints and non-value-added work have generally resulted.

The themes that informed the literature review consisted of three concepts. The concepts were behavior effect, leadership interaction, and employee engagement. Behavior effects consisted of the themes of training and accountability value, the impact of behavior, and work

processes. Leadership interaction consisted of the themes of influence performance, style of approach, and organizational culture. Employee engagement consisted of the themes of standard work associated with quality requirements, execution gaps, and performance results.

Leaders and managers have a significant influence on employee engagement. Employee engagement, in turn, relates to employee satisfaction. Employees that are engaged and satisfied tend to have better performance and productivity. When employees have better performance, the organization performs at a higher level. When organizational performance improves, customers tend to have better service and products are provided as expected. The completion of customer orders, on time and correct, leads to increased customer satisfaction.

The dissertation utilized the paradigm worldview of constructivist with a qualitative method research design (Creswell, 2014). The research assumptions within this constructivist worldview were epistemology. Epistemology includes human element interpretation through study and field observations (Bunge, 1983). The methodology involved a case study that included surveys, observations, and interviews as well as literature research. The research produced a grounded theory based on social structure and human behavior insights.

Based on triangulation of the survey, observation, and interview data the research identified that leadership's actions significantly influence employee's performance. The failure to adhere to quality standard work is tied to the actions and support of leadership and not stereotypically related to employees working to circumvent the quality standard work system. A grounded theory emerged from the triangulation which validates consistent execution of standard work consistency positively correlate with quality-focused manufacturing leadership, training and accountability, and organizational culture and employee engagement.

Organizations with high levels of focused interactive leadership promoting a quality culture that supports employee engagement, training, and accountability provide consistent employee execution of standard work. Organizations with low levels of focused leadership on promoting a quality culture that does not support employee engagement, training, or accountability provide an environment for inconsistent execution of standard work.

Contribution to the Study

This doctoral dissertation has resulted in the creation of new information to add to the body of knowledge. This study has enhanced the relevant body of knowledge by developing a grounded theory. The grounded theory that emerged from the study is leadership directly influences and has a positive correlation with an employee's motivation to consistently perform to the standard work expectations. The study enhanced the body of knowledge by increasing the understanding of how the employees assigned to execute quality standard work make decisions to follow the standards or bypass the standards. Standard work consistency is positively correlated to leadership influence. As leaders are more interactive with employees, standard work consistency increases.

Research question one sought to understand how quality-focused manufacturing leadership influences employee standard work execution consistency. The data shows quality oriented manufacturing leadership has a positive correlation to the influence of employee standard work execution. Organizations with low-quality complaint levels and supportive manufacturing leaders have robust adherence to standard work execution. As leadership support and engagement levels increase, consistency in standard work and related customer product quality levels increase.

Research question two sought to understand how training and accountability influence employee standard work execution consistency. The data indicates training and accountability has a positive correlation with consistent employee adherence to standard work. As training and accountability measures increase, employee adherence to the quality standard work execution consistency increase. Manufacturing organizations that take time and resources to provide training on standard work requirements have high levels of performance. Organizations support the training by verifying knowledge and execution through accountability which results in low amounts of quality defects. Also, performance related to training and accountability of standard work results in high customer satisfaction.

Research question three sought to determine if organizational culture and employee engagement factors contributed to standard work consistency. Organizational culture and employee engagement factors positively correlate to consistent employee adherence of standard work. The more focused the organizational culture and employee engagement factors, the more consistent the employee adherence to the quality standard work execution.

The findings relate to the dissertation theoretical framework. This qualitative method case study sought to gain an understanding of why there are consistency issues with executing the standard work requirements. The means (instruments) to gather data was surveys, field observations, and interviews. Based on the triangulation of the survey, observation, and interview data leadership actions significantly influence employee standard work execution consistency associated with quality escapes.

This research identified that standard work consistency is significantly influenced by quality-focused manufacturing leadership. Quality-focused manufacturing leadership drives organizational culture and employee engagement. Variance in employee engagement is caused

by leadership; in turn, employees are three times more engaged when leaders communicate with them on a regular basis (Pollock, 2016). Quality-focused manufacturing leadership is also responsible for providing and supporting training. Employees that are provided effective training can be held accountable by quality-focused manufacturing leadership for job execution.

Quality-focused manufacturing leadership is responsible for all aspects of employee productivity and performance. As such, standard work consistency can be greatly improved by quality-focused manufacturing leadership providing the necessary attention to training with accountability and organizational culture focused on employee engagement. The failure to adhere to quality standard work is tied to the actions and support of leadership and not related to employees working to circumvent the quality standard work system.

This research design has resulted in a grounded theory regarding standard work consistency in a manufacturing environment. Quality-focused manufacturing leadership is responsible for the quality management system which encompasses organizational training and accountability, and organizational culture and employee engagement. These factors controlled by leadership determine the employees' motivation to execute and follow the required standard work consistently.

The findings are supported by the theory that increased understanding of the causes associated with failure to meet expectations will provide knowledge on how to address quality standard work performance variances within an organization. This qualitative method research contributed to the Quality System Management body of knowledge. The analysis shows a positive correlation with quality-focused manufacturing leadership, training and accountability, and organizational culture and employee engagement factors and employee performance regarding standard work execution consistency.

The findings of this study differ from findings in other studies due to the focus on standard work variation. Several studies have been found to focus on the leadership style and employee engagement but not in relation to variation of the application of standard work. In focusing on standard work adherence, the researcher was able to provide an alternate view. The view of this study provided insight on what influenced employees to adhere to standard work expectations versus on how leadership style or employee engagement factors influenced performance.

Discussion and Implications

The salient evidence-that most likely and effectively addressed quality escapes due to the standard work variance is associated with quality-focused manufacturing leadership. Employee standard work consistency is significantly influenced by quality-focused manufacturing leadership. The data analysis indicated a positive correlation between quality-focused manufacturing leadership and employee consistency in executing standard work. In addition, training and accountability components of leadership showed a positive correlation in standard work consistency. Organizational culture and employee engagement also components tied to quality-focused manufacturing leadership had a positive correlation to standard work consistency.

This research identified that standard work consistency is significantly influenced by quality-focused manufacturing leadership. Quality-focused manufacturing leadership drives organizational culture and employee engagement. Variance in employee engagement is caused by leadership; in turn, employees are three times more engaged when leaders communicate with them on a regular basis (Pollock, 2016). Quality-focused manufacturing leadership is also

responsible for providing and supporting training. Effectively, leadership is the main factor influencing employee standard work consistency.

The study enhanced the body of knowledge by increasing the understanding of how the employees assigned to execute quality standard work make decisions to follow the standards or bypass the standards. As the failure to consistently perform standard work lead to customer complaints (Manghani, 2011), improvements in quality-focused manufacturing leadership, training and accountability, and organizational culture and employee engagement will increase standard work consistency and reduce customer dissatisfaction. It can be concluded that when quality-focused manufacturing leadership is not aligned and supportive of creating a culture that focuses on customer product quality, standard work consistency is negatively impacted. The lack of leadership support also undermines and prevents effective training and accountability measures. The overall lack of employee engagement creates an environment where standard work execution is not fully supported by leadership. The quality of the customer product is compromised when standard work variance occurs.

Recommendations

It is recommended that quality-focused manufacturing leadership support and promote the standard work requirements that are part of the Quality Management System. Support from leadership provides the ability to adjust and make continuous improvement changes. These changes must target closing the loop on standard work variances through training and accountability. The leadership team must ensure the culture supports quality and customer satisfaction by providing the tools and knowledge to perform successfully. Leaderships' actions directly influence the success of employee consistency in executing standard work. To improve

customer product quality, leadership must support, fund, and engage activities in promoting standard work adherence.

Possible directions for future research are ways to benchmark successful managers. The element that is unclear concerning managers and leaders is why they choose to lead or manage in their selected style. There perhaps is a perceived notion that managers or leaders do not understand the damage they are causing in their communication to others in the organization. Another direction for future research is why management has a different perspective on what is happening on the manufacturing floor. Several managers assume standard work and requirements are being performed, but in reality, there are gaps in execution.

Additional direction for future research can be to understand what traits leaders need to have to ensure employees have the tools and knowledge to execute standard work consistently. Further opportunity could be to determine the best method to improve standard work consistency could be to understand the approach leaders should take to improve organizational culture and employee engagement. Engagement could be researched by focusing on the best training methods and materials for manufacturing environments. An alternate possibility is to identify alternate methods for creating a culture of accountability that focuses on the standard work components of the quality management system. Determining the methods to improve standard work consistency through a culture that focuses on customer expectations is also a direction for investigation.

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Appendix A

Protecting Human as Research Subjects training and testing provided by the NIH Office of Extramural Research was successfully completed prior to interacting with study participants. Completion of this training was required prior to interacting with research participants. Training was successfully completed on September 8, 2017.

Figure A. Certificate of Completion - NIH



Figure A. Certificate of Completion from The National Institutes of Health (NIH) Office of Extramural Research for the training course "Protecting Human Research Participants".

Appendix B

IRB Application Form

IRB Review Application

This application is submitted to comply with the NGS (NECB) Institutional Review Board Policy. No research shall be conducted that remotely exposes human subjects to the unreasonable risk of harm. Doctoral students must apply for and receive IRB approval prior to conducting any form of original research, regardless of the subject or scope of their dissertation projects. Master's and baccalaureate-level students must apply for and receive IRB approval only if their research involves human subjects.

Review Status (completed by IRB Reviewer)

Reviewer:		Date:	
IRB Result:	<input type="checkbox"/> Authorization approved to conduct research involving human subjects. <input type="checkbox"/> Authorization not approved . Changes required for resubmission. <input type="checkbox"/> Authorization approved . Human subjects not used in study.		
Expiration date one year following date of IRB Review approval:			

Project Details (completed by student applicant)

Student:		Date:	
Program	<input type="checkbox"/> BS <input type="checkbox"/> MS <input checked="" type="checkbox"/> DBA <input type="checkbox"/> Post Doc		
Dissertation/Project Title:			
Dissertation Chair (or BS or MS Faculty Supervisor):			

Summary (to be completed by student applicant)

Participants	Y/N	Risks	Y/N
Are human participants used in the data collection process?		Are risks to human subjects minimized?	
Are participants in a protected class (minors, prisoners, pregnant women, human fetuses, and neonates)?		Are risks to subjects reasonable in relation to anticipated benefits?	
Adequate provisions are used to maintain confidentiality of data?		Is informed consent sought and documented by having all participants sign consent to participate form prior to data collection? Attach form to this application.	

IRB Review Requirements	Student Response (Completed by Student Applicant)	IRB Recommendation (Completed by IRB)
Describe the human participants of the study.		
Describe the data collection process.		
Describe procedures that might harm subjects physically.		
Describe procedures that deprive subject of		

IRB Review Requirements	Student Response (Completed by Student Applicant)	IRB Recommendation (Completed by IRB)
necessary or accustomed resources.		
Describe procedures used for hypnosis or unusual degrees of mental stress.		
Describe the use of subjects who are not able to give free and informed consent (minors, prisoners, pregnant women, human fetuses, and neonates).		
Describe procedures for gaining consent from responsible guardian to use participants of a protected class.		
Provide additional procedures to protect participants in a protected class from both physical and mental harm or risk of harm.		
Provide explicit or implicit description of subjects in any aspect likely to be significant to them.		
Disclose the use of subjects who are available because they need professional services.		
Disclose activities that may be illegal, or are likely to offend prevailing standards of morality.		
Describe procedure for participants who want to withdraw from the study. If data was collected from a participant who withdraws, describe the destruction of data collected from this participant.		
Describe process for protecting the identity of participants.		

IRB Review Requirements	Student Response (Completed by Student Applicant)	IRB Recommendation (Completed by IRB)
Describe people other than yourself (co-researcher or research assistant) who will have access to the identity of participants and process for non-disclosure of information.		
Describe your relationship with participants (co-workers, subordinates, etc.)		
Describe monetary or material resources used to gain or reward participation.		
Describe the benefit a participant would gain from active participation in the study.		
Describe state or local laws involving studies using humans as research subjects.		
Describe procedure for secured storage of data for 5 years after study is complete.		
Describe procedure for disposal and destruction of data (electronic, paper, redundant copies) after 5 years from completion of study.		

Appendix C

Participant Disclosure Statement for Research of Data Collection

The survey consent stated:

SURVEY or INTERVIEW PARTICIPANTS:

Hello,

You are invited to participate in a study by completing this survey. The information in this survey will be utilized for a research dissertation project. The purpose of the study is to determine possible solutions to improving standard work activities. There are no foreseeable risks to participants, as all responses and identities will be confidential and anonymous only your job classification and plant location may be used. Completing the survey is voluntary. Please answer the questions honestly based on current conditions. There is no compensation for participating in this study. Based on the research, there may be some benefits to how standard work is developed and presented in the future. If you have any questions regarding the study, please contact Tara Holloway. You understand that participation is voluntary, and you may withdraw from the study at any time. Your participation in completing the survey means that you understand the information presented and are willing to participate in the study.

Thank you,

Tara Holloway, Doctoral Candidate National Graduate School of Quality Systems
Management / New England College of Business

Appendix D

Survey Document

Plant Location:				DATE:				
Job Classification/Title (please circle one):				Shift:				
Supervisor Manager Operator Inspector Auditor Other _____								
Years with Company (circle one): a. Less than 1 year b. 1-5 years c. 6-15 years d. 16-25 years e. 26+ years								
Name (optional):				Age (optional) circle one: Under 25 25-35 36-45 46-60 60+				
	Survey Questions			Response				
1	My supervisor gives me ongoing feedback that helps me improve my performance.			Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
2	My supervisor holds me accountable for performance.			Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
3	My supervisor holds my co-workers accountable for performance.			Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
4	I understand how my work directly contributes to the overall success of my company.			Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
5	I received training on the standard work for my job.			Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
6	I understand my responsibilities in executing standard work.			Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
7	I understand “why” the standard work is important.			Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
8	I understand how to execute the standard work requirements.			Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
9	My co-workers know how to execute the standard work requirements.			Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
10	I know where to find the standard work requirements, for example the work instruction or form for completion.			Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
11	Sometimes, I skip steps of the standard work.			Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
12	I skip steps because I do not know how to do them.			Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
13	I skip steps because I do know how to do them.			Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
14	Standard work steps are skipped because there is not enough time to do all of them.			Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
15	I will notify my supervisor when there is something missing from the standard work.			Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
16	I will notify my supervisor when there is something incorrect in the standard work.			Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
17	Standard work steps are skipped because some steps are not needed.			Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
18	If I skip steps, it is because (please fill in the blank):							

19	If standard work process steps are skipped, no one will comment or say anything.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
20	I let my supervisor know if I cannot perform all of my standard work.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
21	My supervisor told me to stop doing the steps of the standard work.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
22	My supervisor knows that some people skip steps of the standard work.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
23	Sometimes my supervisor helps complete some of the standard work steps.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
24	My supervisor reviews the completed paperwork / forms.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
25	Sometimes my supervisor audits the standard work process during and/or after the standard work activities have been completed.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
26	I follow the standard work more closely if I know my supervisor is going to audit the area.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
27	I support a quality culture.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
28	Management supports a quality culture.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
29	My direct supervisor acts as if quality and the customer are the top priorities after safety.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
30	I can stop production if there is a quality issue.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
31	Sometimes the production schedule or costs are more important than quality.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
32	My supervisor recently told me to save/pack product that is out of specification.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
33	Suspect product (out of specification) is always held for inspection when an issue is identified.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
34	I know the customer quality requirements.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Comments (optional) please use the back of this page if you have more comments:						

Appendix E

Pilot Study Results

The results of the data analysis for the pilot study which consisted of 21 responses are shown in Appendix E. The survey responses obtained were analyzed in Minitab statistical software. The survey question responses associated with each research question and the quality level of the plant where the participants worked were used for the analysis. The goal of the pilot study was to determine if the survey questions were clear and facilitated the effective collection of participants' opinions. The results provided the researcher with confidence that the survey tool questions were clear and straightforward to facilitate the effective collection of participants' opinions.

In reviewing research questions: 1) How does quality-focused manufacturing leadership influence employee standard work execution consistency? 2) How does training and accountability influence employee standard work consistency? and 3) Do organizational culture and employee engagement factors contribute to standard work consistency?, the associated survey question responses were analyzed with the quality levels or performance of the participating plants. The adherence to standard work reduces the likelihood of customer complaints (Manghani, 2011) which is indicated in plant quality performance. The pilot study results showed positive correlations with quality-focused manufacturing leadership, training and accountability, and organizational culture and employee engagement factors with standard work execution consistency as shown in Figure E1, Figure E2, and Figure E3 scatterplot graphs and the Pearson Correlation results are in Table E1, Table E2, and Table E3.

Figure E1 Scatterplot Pilot Study Research Question One

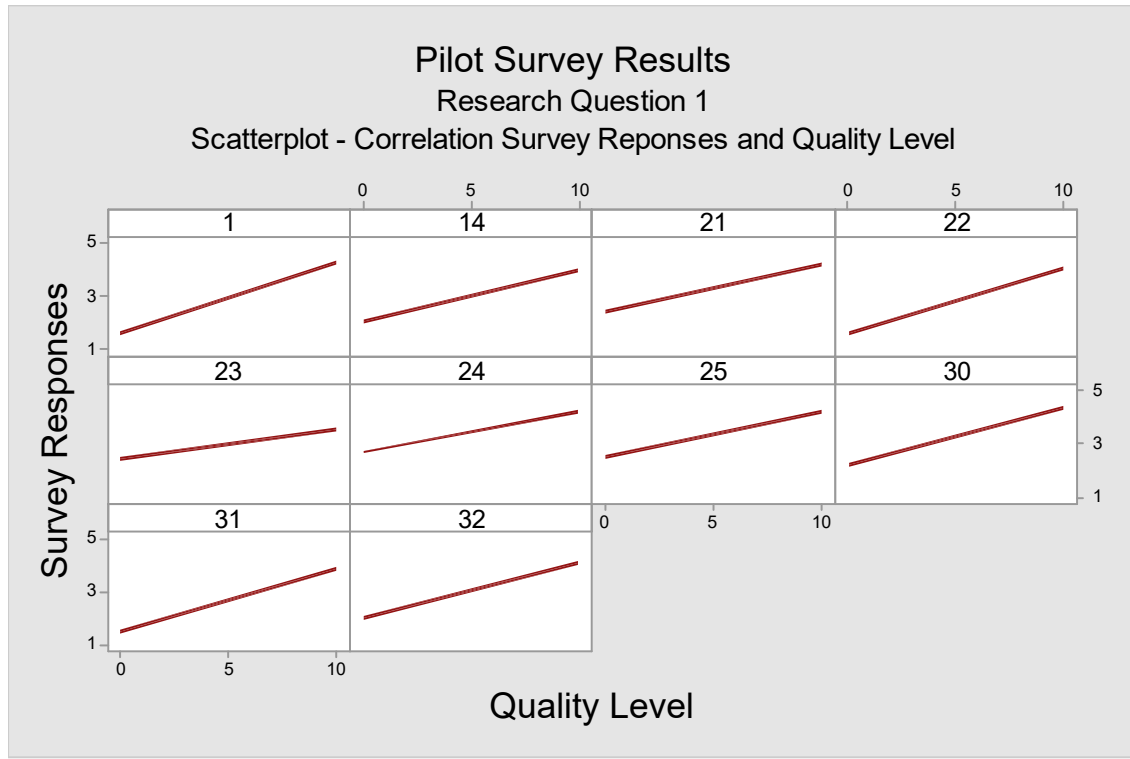


Figure E1. Research Question One pilot survey results of scatterplot for quality level shows a positive correlation. Each pilot study survey question associated with research question one is provided. The survey questions associated with research question one were 1, 14, 21, 22, 23, 24, 25, 30, 31, and 32.

Figure E2 Scatterplot Pilot Study Research Question Two

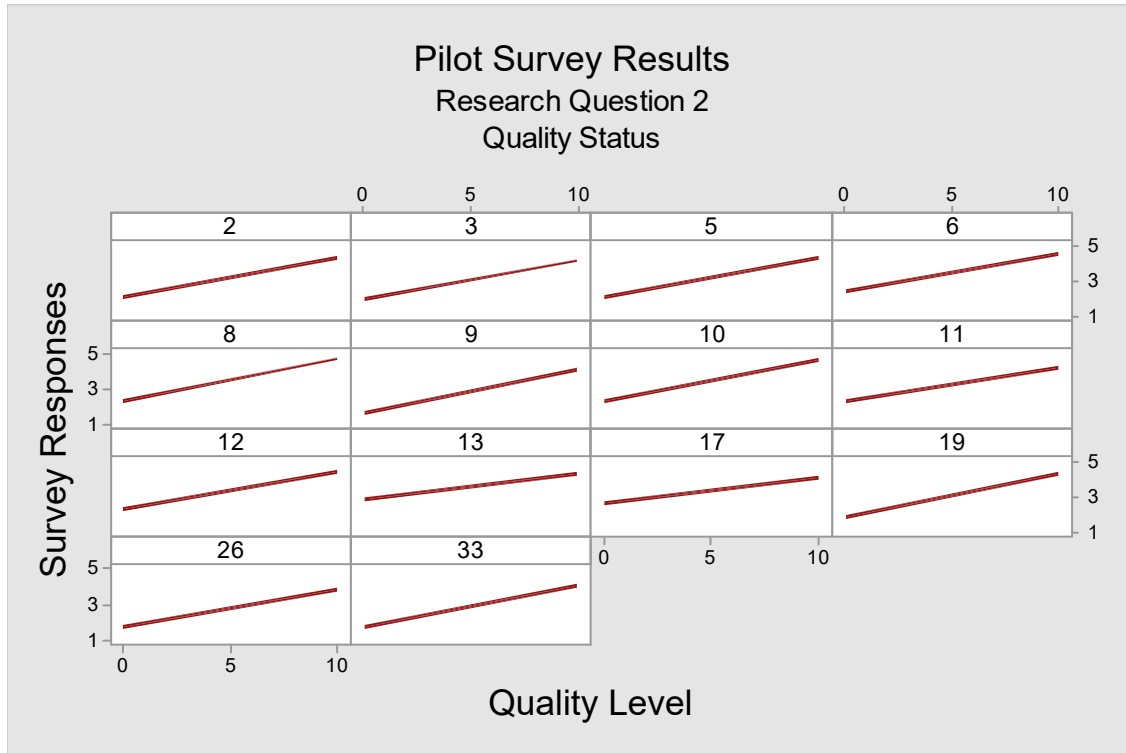


Figure E2. Research Question Two pilot survey results of scatterplot for quality level shows a positive correlation. Each pilot study survey question associated with research question two is provided. The survey questions associated with research question two were 2, 3, 5, 6, 8, 9, 10, 11, 12, 13, 17, 19, 26, and 33.

Figure E3 Scatterplot Pilot Study Research Question Three

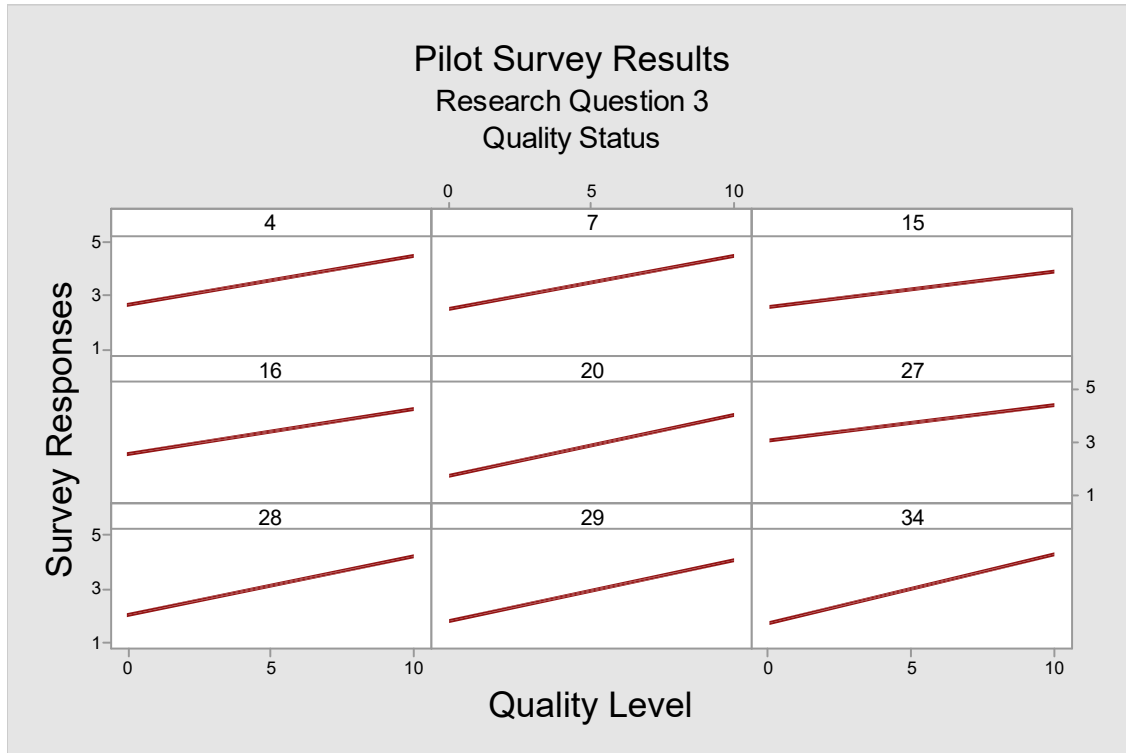


Figure E3. Research Question Three pilot survey results of scatterplot for quality level shows a positive correlation. Each pilot study survey question associated with research question three is provided. The survey questions associated with research question three were 4, 7, 15, 16, 20, 27, 28, 29, and 34.

Table E1

Pilot Study Correlation Results - Quality Level, Research Question One Survey Questions

	Quality Level	1	14	21	22	23	24	25	30	31
1	0.925									
	0									
14	0.776	0.796								
	0	0								
21	0.763	0.79	0.838							
	0	0	0							
22	0.835	0.824	0.855	0.911						
	0	0	0	0						
23	0.441	0.494	0.402	0.421	0.345					
	0.045	0.023	0.071	0.057	0.125					
24	0.642	0.765	0.776	0.817	0.661	0.587				
	0.002	0	0	0	0.001	0.005				
25	0.652	0.748	0.764	0.813	0.678	0.618	0.947			
	0.001	0	0	0	0.001	0.003	0			
30	0.737	0.8	0.874	0.752	0.764	0.386	0.666	0.664		
	0	0	0	0	0	0.084	0.001	0.001		
31	0.862	0.91	0.914	0.857	0.936	0.503	0.757	0.763	0.843	
	0	0	0	0	0	0.02	0	0	0	
32	0.765	0.79	0.881	0.876	0.875	0.525	0.776	0.794	0.761	0.906
	0	0	0	0	0	0.015	0	0	0	0

Note. Cell Contents:
 Pearson Correlation
 *P-Value

Table E2

*Pilot Study Correlation Results - Quality Level, Research Question Two
Survey Questions*

Quality Level	2	3	5	6	8	9	10	11	12	13	17	19	26	
2	0.926 0													
3	0.836 0	0.906 0												
5	0.832 0	0.898 0	0.913 0											
6	0.797 0	0.828 0	0.814 0	0.873 0										
8	0.82 0	0.822 0	0.869 0	0.942 0	0.874 0									
9	0.835 0	0.84 0	0.905 0	0.904 0	0.806 0	0.879 0								
10	0.768 0	0.718 0	0.764 0	0.871 0	0.811 0	0.937 0	0.882 0							
11	0.739 0	0.726 0	0.784 0	0.818 0	0.694 0	0.788 0	0.879 0	0.864 0						
12	0.7 0	0.748 0	0.834 0	0.926 0	0.83 0	0.933 0	0.829 0	0.894 0	0.83 0					
13	0.595 0.004	0.56 0.008	0.646 0.002	0.611 0.003	0.568 0.007	0.614 0.003	0.765 0	0.715 0	0.886 0	0.64 0.002				
17	0.634 0.002	0.639 0.002	0.72 0	0.754 0	0.719 0	0.691 0.001	0.84 0	0.781 0	0.911 0	0.748 0	0.923 0			
19	0.828 0	0.859 0	0.919 0	0.948 0	0.847 0	0.907 0	0.948 0	0.889 0	0.932 0	0.907 0	0.779 0	0.859 0		
26	0.779 0	0.742 0	0.816 0	0.73 0	0.632 0.002	0.735 0	0.9 0	0.716 0	0.793 0	0.682 0.001	0.741 0	0.707 0	0.825 0	
33	0.827 0	0.865 0	0.918 0	0.906 0	0.752 0	0.87 0	0.887 0	0.851 0	0.913 0	0.858 0	0.73 0	0.793 0	0.937 0	0.768 0

Note. Cell Contents:
Pearson Correlation
*P-Value

Table E3

Pilot Study Correlation Results - Quality Level, Research Question Three Survey Questions

	Quality Level	4	7	15	16	20	27	28	29
4	0.785 0								
7	0.708 0	0.931 0							
15	0.564 0.008	0.721 0	0.721 0						
16	0.704 0	0.725 0	0.661 0.001	0.878 0					
20	0.877 0	0.753 0	0.699 0	0.607 0.004	0.758 0				
27	0.63 0.002	0.869 0	0.802 0	0.685 0.001	0.67 0.001	0.616 0.003			
28	0.792 0	0.784 0	0.784 0	0.855 0	0.85 0	0.756 0	0.695 0		
29	0.844 0	0.813 0	0.775 0	0.874 0	0.894 0	0.824 0	0.698 0	0.961 0	
34	0.842 0	0.843 0	0.842 0	0.718 0	0.714 0	0.72 0	0.717 0	0.903 0	0.896 0

Note. Cell Contents:
 Pearson Correlation
 *P-Value

Appendix F

Research Question One

How does quality-focused manufacturing leadership influence employee standard work execution consistency?

The Pearson correlation is utilized to examine the linear relationship between variables (Minitab Express Support, 2017). Within a coefficient range of -1 to +1, the larger the absolute value of the coefficient the stronger the relationship between variables (Minitab Express Support, 2017). When the variables increase or decrease together, the coefficient is positive and has an upward line slope on the scatterplot graph. The results of the research indicate the variables studied positively correlate with standard work consistency. In addition to the Pearson correlation which indicates the linear relationship, the p-value determines if the correlation coefficient is statistically significant (Minitab Express Support, 2017). When the p-value is less than or equal to the significance level, the correlation is statistically significant (Minitab Express Support, 2017). The significance level utilized in this study was 0.05.

Research question one for both the employee sample population and the leader sample population survey results indicate quality-focused manufacturing leadership positively correlates with standard work consistency. The Pearson correlation coefficient along with the p-value for the employee sample population are in Table F1 and Table F2 for the leader sample population. All responses for research question one from both employee and leader sample populations indicate a positive correlation exists. In addition, all survey questions associated with research question one for quality-focused manufacturing leadership associated with standard work consistency were statistically significant. Based on the correlation results, a positive correlation exists between quality-focused manufacturing leadership and standard work consistency. The

results indicate that as quality-focused manufacturing leadership increases, standard work consistency increases.

Table F1

Employee Population Research Question One Correlation: Quality Level, Years of Experience with Organization, Plant Status (Stage of Development), Survey Questions 1, 14, 21, 22, 23, 24, 25, 30, 31, 32

	Quality Level	Years w Org	Plant Status	SQ 1	SQ 14
Years w Org	0.483				
	0.000				
Plant Status	0.864	0.488			
	0.000	0.000			
SQ 1	0.868	0.640	0.881		
	0.000	0.000	0.000		
SQ 14	0.735	0.408	0.826	0.870	
	0.000	0.000	0.000	0.000	
SQ 21	0.810	0.425	0.703	0.615	0.638
	0.000	0.000	0.000	0.000	0.000
SQ 22	0.835	0.453	0.716	0.679	0.663
	0.000	0.000	0.000	0.000	0.000
SQ 23	0.661	0.405	0.786	0.807	0.744
	0.000	0.000	0.000	0.000	0.000
SQ 24	0.780	0.375	0.829	0.887	0.796
	0.000	0.000	0.000	0.000	0.000
SQ 25	0.793	0.354	0.824	0.849	0.749
	0.000	0.000	0.000	0.000	0.000
SQ 30	0.772	0.453	0.808	0.890	0.828
	0.000	0.000	0.000	0.000	0.000
SQ 31	0.735	0.433	0.815	0.900	0.880
	0.000	0.000	0.000	0.000	0.000
SQ 32	0.823	0.460	0.719	0.710	0.668

	0.000	0.000	0.000	0.000	0.000
	SQ 21	SQ 22	SQ 23	SQ 24	SQ 25
SQ 22	0.897				
	0.000				
SQ 23	0.455	0.540			
	0.000	0.000			
SQ 24	0.741	0.714	0.761		
	0.000	0.000	0.000		
SQ 25	0.753	0.771	0.761	0.833	
	0.000	0.000	0.000	0.000	
SQ 30	0.638	0.754	0.772	0.752	0.762
	0.000	0.000	0.000	0.000	0.000
SQ 31	0.604	0.667	0.770	0.754	0.770
	0.000	0.000	0.000	0.000	0.000
SQ 32	0.848	0.878	0.603	0.780	0.820
	0.000	0.000	0.000	0.000	0.000
	SQ 30	SQ 31			
SQ 31	0.859				
	0.000				
SQ 32	0.754	0.707			
	0.000	0.000			

Note. Cell Contents
 Pearson correlation
 *P-Value

Table F2

Leader Population Research Question One Correlation: Quality Level, Years of Experience with Organization, Plant Status (Stage of Development), Survey Questions 1, 14, 21, 22, 23, 24, 25, 30, 31, 32

	Quality Level	Years w Org	Plant Status	SQ 1	SQ 14
Years w Org	0.481				
	0.011				
Plant Status	0.879	0.469			
	0.000	0.014			
SQ 1	0.875	0.636	0.875		
	0.000	0.003	0.000		
SQ 14	0.797	0.530	0.923	0.906	
	0.000	0.005	0.000	0.000	
SQ 21	0.885	0.564	0.885	0.978	0.903
	0.000	0.010	0.000	0.000	0.000
SQ 22	0.869	0.429	0.869	0.842	0.842
	0.000	0.059	0.000	0.000	0.000
SQ 23	0.775	0.297	0.854	0.760	0.806
	0.000	0.140	0.000	0.000	0.000
SQ 24	0.900	0.580	0.907	0.938	0.898
	0.000	0.002	0.000	0.000	0.000
SQ 25	0.921	0.501	0.897	0.888	0.877
	0.000	0.009	0.000	0.000	0.000
SQ 30	0.795	0.541	0.869	0.924	0.853
	0.000	0.004	0.000	0.000	0.000
SQ 31	0.806	0.411	0.917	0.911	0.861
	0.000	0.033	0.000	0.000	0.000
SQ 32	0.958	0.518	0.958	0.871	0.938
	0.000	0.019	0.000	0.000	0.000
	SQ 21	SQ 22	SQ 23	SQ 24	SQ 25
SQ 22	0.870				

	0.000				
SQ 23	0.775	0.839			
	0.000	0.000			
SQ 24	0.928	0.877	0.790		
	0.000	0.000	0.000		
SQ 25	0.884	0.872	0.825	0.928	
	0.000	0.000	0.000	0.000	
SQ 30	0.911	0.735	0.725	0.881	0.844
	0.000	0.000	0.000	0.000	0.000
SQ 31	0.931	0.900	0.834	0.836	0.887
	0.000	0.000	0.000	0.000	0.000
SQ 32	0.888	0.856	0.813	0.926	0.928
	0.000	0.000	0.000	0.000	0.000
	SQ 30	SQ 31			
SQ 31	0.815				
	0.000				
SQ 32	0.811	0.950			
	0.000	0.000			

Note. Cell Contents:
 Pearson correlation
 *P-Value

Based on the survey data focused on quality-focused manufacturing leadership, research question one survey results for both employees and leaders positively correlate with standard work consistency and years of experience with the organization. Also, all of the results indicate a statistically significant positive correlation with years of experience with the organization except for survey questions 22 and 23. Survey question 22 states: My supervisor knows that some people skip steps of the standard work. Survey question 23 states: Sometimes my supervisor helps complete some of the standard work steps. While there is a positive correlation, the p-value indicates it is not statically significant with these outliers. The scatterplots of this

correlation can be found in Figure F1 for employee results and Figure F2 for leader results. As the years of experience of employees increases so does quality-focused manufacturing leadership in impacting standard work adherence from both a leader and employee perspective.

Figure F1. Employee Sample Population - Research Question One – Years of Experience with the Organization

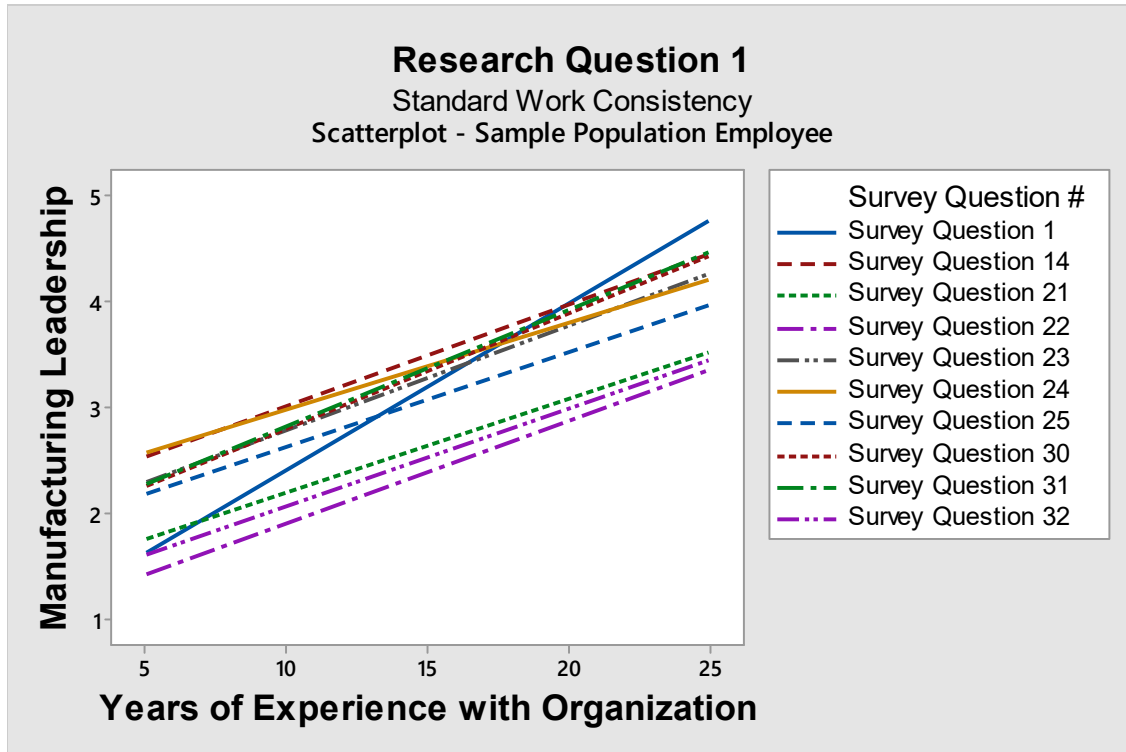


Figure F1. Research question one scatterplot graph of the employee sample population and years of experience with the organization. The graph illustrates that quality-focused manufacturing leadership is positively correlated with years of experience with the organization in relation to standard work consistency.

Figure F2. Leader Sample Population - Research Question One – Years of Experience with the Organization

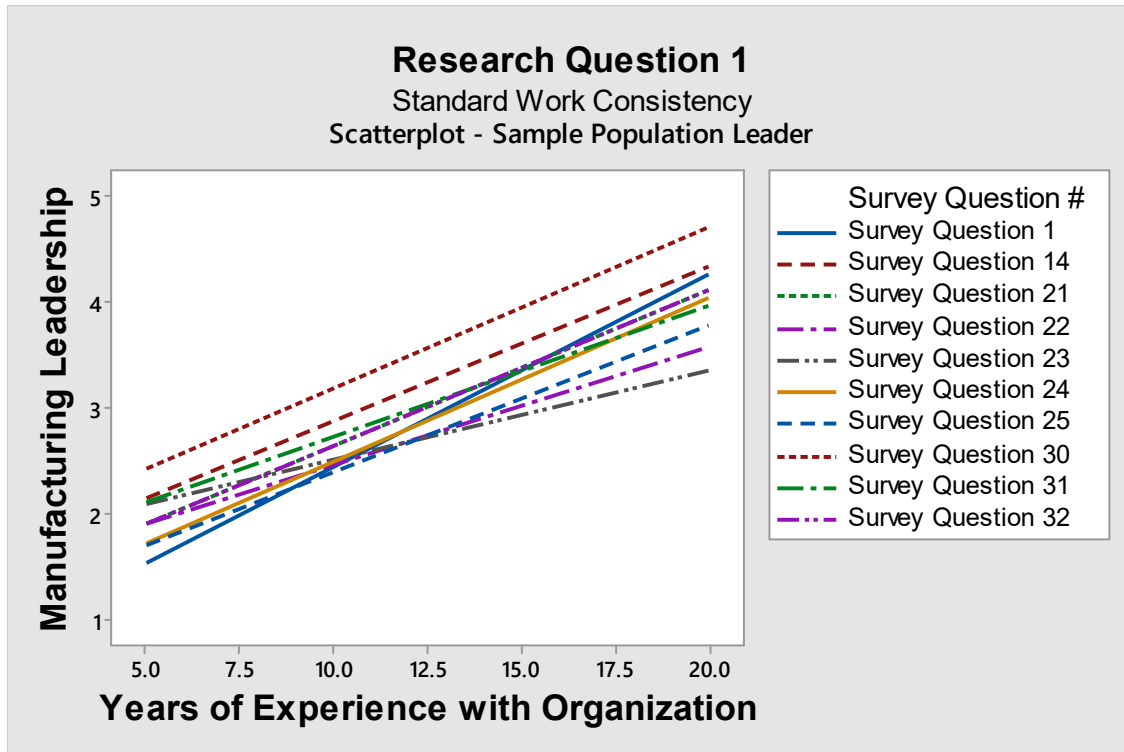


Figure F2. Research question one scatterplot graph of the leader sample population and years of experience with the organization. The graph illustrates that quality-focused manufacturing leadership is positively correlated with years of experience with the organization in relation to standard work consistency.

In addition, quality-focused manufacturing leadership influence of standard work consistency for both employees and leaders positively correlated with the maturity of the manufacturing plant. An increase in the age of the plant will have an increase in quality-focused manufacturing leadership influenced standard work consistency. The scatterplots of this correlation can be found in Figure F3 for employee results and Figure F4 for leader results. A positive correlation is found in responses from both the leader and employee sample populations. As the maturity of the plant increases so does quality-focused manufacturing leadership in impacting standard work consistency from both employee and leader perspectives.

Figure F3. Employee Sample Population - Research Question One – Plant Stage of Development

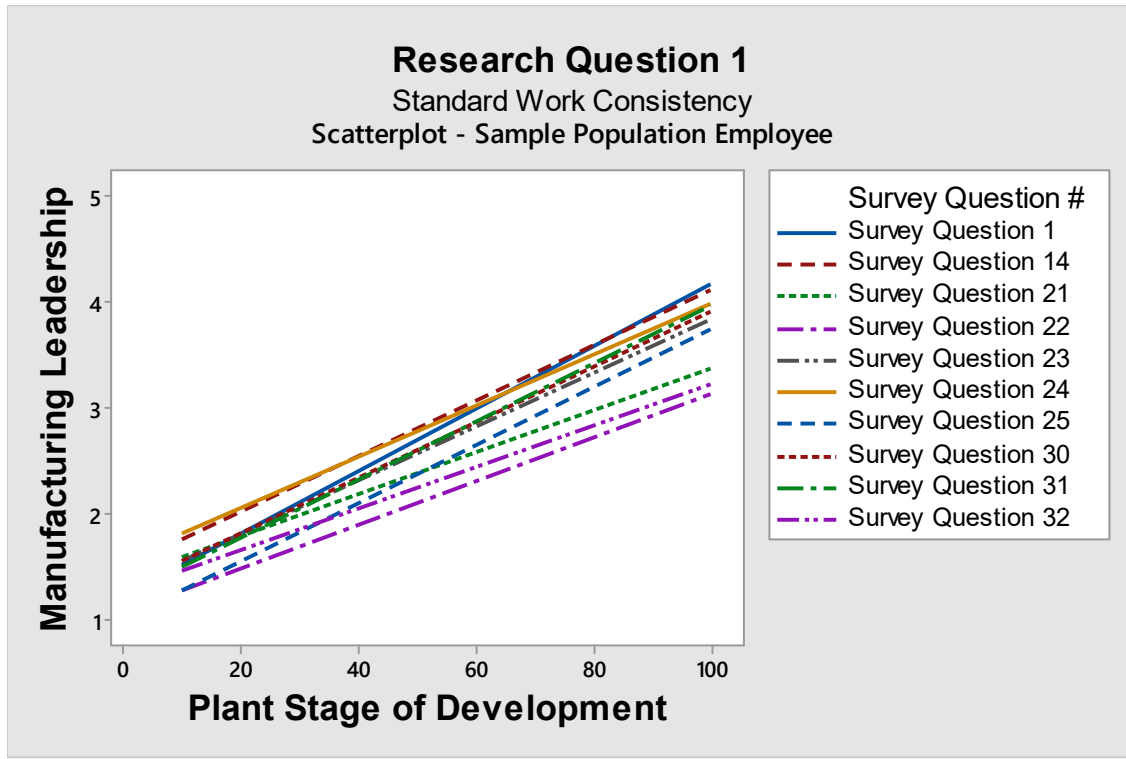


Figure F3. Research question one scatterplot graph of the employee sample population and plant tenure or stage of development. The graph illustrates that quality-focused manufacturing leadership is positively correlated with plant stage of development with the organization in relation to standard work consistency.

Figure F4. Leader Sample Population - Research Question One – Plant Stage of Development

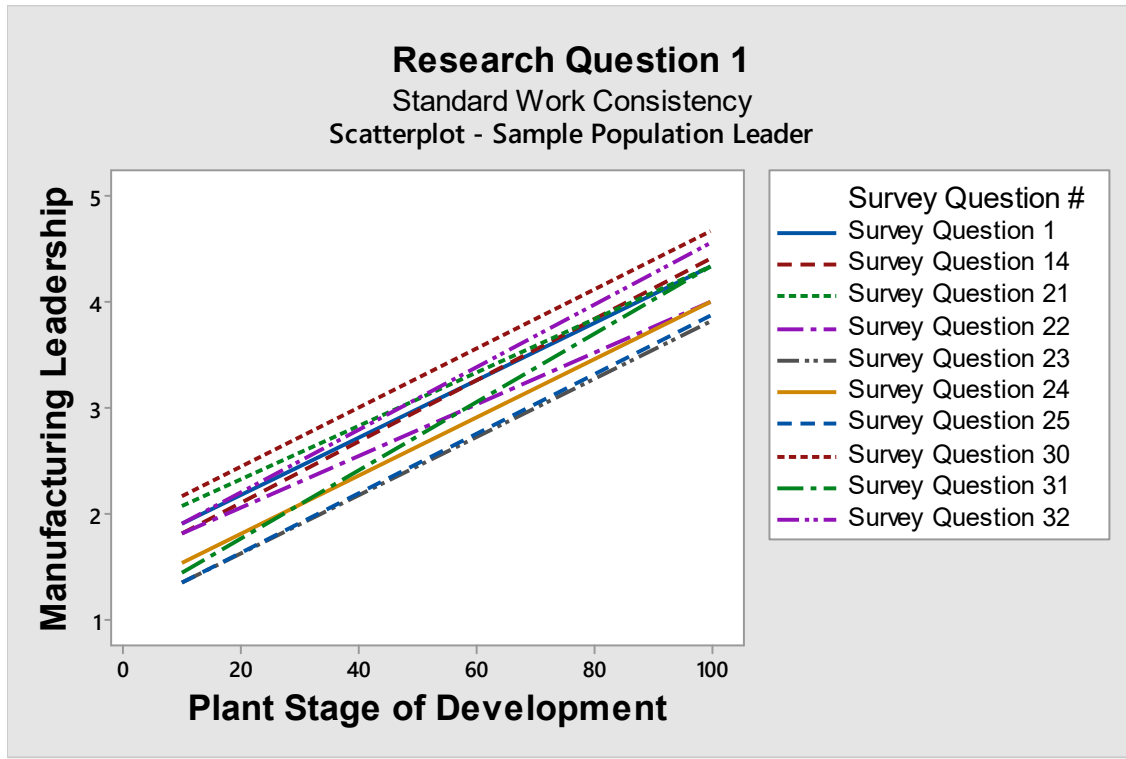


Figure F4. Research question one scatterplot graph of the leader sample population and plant tenure or stage of development. The graph illustrates that quality-focused manufacturing leadership is positively correlated with plant stage of development with the organization in relation to standard work consistency.

Appendix G

Research Question Two

How does training and accountability influence employee standard work execution consistency?

The Pearson correlation is utilized to examine the linear relationship between variables (Minitab Express Support, 2017). Within a coefficient range of -1 to +1, the larger the absolute value of the coefficient the stronger the relationship between variables (Minitab Express Support, 2017). When the variables increase or decrease together, the coefficient is positive and has an upward line slope on the scatterplot graph. The results of the research indicate the variables studied positively correlate with standard work consistency. In addition to the Pearson correlation which indicates the linear relationship, the p-value determines if the correlation coefficient is statistically significant (Minitab Express Support, 2017). When the p-value is less than or equal to the significance level, the correlation is statistically significant (Minitab Express Support, 2017). The significance level utilized in this study was 0.05.

Research question two for both the employee sample population and the leader sample population survey results indicate training and accountability positively correlate with standard work consistency. The Pearson correlation coefficient along with the p-value for the employee sample population are in Table G1 and Table G2 for the leader sample population. All responses for research question two from employee and leader populations indicate a positive correlation exists. In addition, all survey questions associated with research question two were statistically significant. Based on the correlation results, a positive correlation exists between training and accountability and standard work consistency. The results indicate that as training and accountability increases, standard work consistency increases.

Table G1

Employee Population Research Question Two Correlation: Quality Level, Years of Experience with Organization, Plant Status (Stage of Development), Survey Questions 2, 3, 5, 6, 8, 9, 10, 11, 12, 13, 17, 19, 26, 33

	Quality Level	Years w Org	Plant Status	SQ 2	SQ 3
Years w Org	0.483				
	0.000				
Plant Status	0.864	0.488			
	0.000	0.000			
SQ 2	0.887	0.609	0.907		
	0.000	0.000	0.000		
SQ 3	0.824	0.643	0.877	0.915	
	0.000	0.000	0.000	0.000	
SQ 5	0.802	0.460	0.879	0.933	0.918
	0.000	0.000	0.000	0.000	0.000
SQ 6	0.843	0.431	0.938	0.936	0.916
	0.000	0.000	0.000	0.000	0.000
SQ 8	0.820	0.423	0.915	0.892	0.904
	0.000	0.000	0.000	0.000	0.000
SQ 9	0.716	0.295	0.758	0.872	0.896
	0.000	0.000	0.000	0.000	0.000
SQ 10	0.809	0.420	0.907	0.887	0.853
	0.000	0.000	0.000	0.000	0.000
SQ 11	0.761	0.368	0.840	0.812	0.818
	0.000	0.000	0.000	0.000	0.000
SQ 12	0.784	0.439	0.896	0.830	0.876
	0.000	0.000	0.000	0.000	0.000
SQ 13	0.604	0.323	0.663	0.623	0.642
	0.000	0.000	0.000	0.000	0.000
SQ 17	0.717	0.293	0.774	0.843	0.817
	0.000	0.001	0.000	0.000	0.000

SQ 19	0.731	0.353	0.779	0.809	0.827
	0.000	0.000	0.000	0.000	0.000
SQ 26	0.449	0.360	0.412	0.490	0.505
	0.000	0.000	0.000	0.000	0.000
SQ 33	0.776	0.451	0.838	0.881	0.887
	0.000	0.000	0.000	0.000	0.000
	SQ 5	SQ 6	SQ 8	SQ 9	SQ 10
SQ 6	0.914				
	0.000				
SQ 8	0.874	0.942			
	0.000	0.000			
SQ 9	0.781	0.808	0.801		
	0.000	0.000	0.000		
SQ 10	0.873	0.920	0.912	0.787	
	0.000	0.000	0.000	0.000	
SQ 11	0.820	0.861	0.852	0.750	0.903
	0.000	0.000	0.000	0.000	0.000
SQ 12	0.873	0.890	0.880	0.754	0.910
	0.000	0.000	0.000	0.000	0.000
SQ 13	0.669	0.677	0.684	0.640	0.760
	0.000	0.000	0.000	0.000	0.000
SQ 17	0.744	0.774	0.771	0.782	0.797
	0.000	0.000	0.000	0.000	0.000
SQ 19	0.799	0.813	0.830	0.761	0.825
	0.000	0.000	0.000	0.000	0.000
SQ 26	0.436	0.443	0.466	0.387	0.526
	0.000	0.000	0.000	0.000	0.000
SQ 33	0.800	0.846	0.830	0.686	0.859
	0.000	0.000	0.000	0.000	0.000
	SQ 11	SQ 12	SQ 13	SQ 17	SQ 19
SQ 12	0.919				

	0.000				
SQ 13	0.834	0.792			
	0.000	0.000			
SQ 17	0.830	0.766	0.731		
	0.000	0.000	0.000		
SQ 19	0.832	0.809	0.713	0.724	
	0.000	0.000	0.000	0.000	
SQ 26	0.526	0.513	0.655	0.494	0.437
	0.000	0.000	0.000	0.000	0.000
SQ 33	0.839	0.836	0.652	0.738	0.765
	0.000	0.000	0.000	0.000	0.000
<hr/>					
SQ 26					
SQ 33	0.422				
	0.000				

Note. Cell Contents
 Pearson correlation
 *P-Value

Table G2

Leader Population Research Question Two Correlation: Quality Level, Years of Experience with Organization, Plant Status (Stage of Development), Survey Questions 2, 3, 5, 6, 8, 9, 10, 11, 12, 13, 17, 19, 26, 33

	Quality Level	Years w Org	Plant Status	SQ 2	SQ 3
Years w Org	0.481				
	0.011				
Plant Status	0.879	0.469			
	0.000	0.014			
SQ 2	0.881	0.663	0.881		
	0.000	0.001	0.000		
SQ 3	0.882	0.693	0.882	0.982	
	0.000	0.001	0.000	0.000	
SQ 5	0.833	0.611	0.931	0.930	0.944
	0.000	0.001	0.000	0.000	0.000
SQ 6	0.822	0.639	0.900	0.875	0.870
	0.000	0.000	0.000	0.000	0.000
SQ 8	0.854	0.602	0.909	0.879	0.888
	0.000	0.001	0.000	0.000	0.000
SQ 9	0.845	0.562	0.930	0.865	0.875
	0.000	0.002	0.000	0.000	0.000
SQ 10	0.894	0.587	0.946	0.874	0.850
	0.000	0.002	0.000	0.000	0.000
SQ 11	0.797	0.476	0.905	0.912	0.903
	0.000	0.014	0.000	0.000	0.000
SQ 12	0.789	0.499	0.882	0.978	0.966
	0.000	0.010	0.000	0.000	0.000
SQ 13	0.799	0.546	0.876	0.827	0.834
	0.000	0.004	0.000	0.000	0.000
SQ 17	0.756	0.565	0.820	0.773	0.785
	0.000	0.003	0.000	0.000	0.000

SQ 19	0.706	0.431	0.739	0.715	0.715
	0.000	0.028	0.000	0.000	0.000
SQ 26	0.626	0.266	0.680	0.766	0.775
	0.000	0.190	0.000	0.000	0.000
SQ 33	0.782	0.409	0.924	0.900	0.887
	0.000	0.034	0.000	0.000	0.000
	SQ 5	SQ 6	SQ 8	SQ 9	SQ 10
SQ 6	0.910				
	0.000				
SQ 8	0.886	0.906			
	0.000	0.000			
SQ 9	0.935	0.931	0.917		
	0.000	0.000	0.000		
SQ 10	0.894	0.938	0.945	0.951	
	0.000	0.000	0.000	0.000	
SQ 11	0.910	0.904	0.889	0.908	0.896
	0.000	0.000	0.000	0.000	0.000
SQ 12	0.896	0.882	0.881	0.850	0.867
	0.000	0.000	0.000	0.000	0.000
SQ 13	0.872	0.888	0.856	0.867	0.888
	0.000	0.000	0.000	0.000	0.000
SQ 17	0.819	0.853	0.792	0.832	0.844
	0.000	0.000	0.000	0.000	0.000
SQ 19	0.768	0.659	0.687	0.727	0.710
	0.000	0.000	0.000	0.000	0.000
SQ 26	0.664	0.625	0.627	0.669	0.640
	0.000	0.000	0.000	0.000	0.000
SQ 33	0.889	0.842	0.861	0.872	0.877
	0.000	0.000	0.000	0.000	0.000
	SQ 11	SQ 12	SQ 13	SQ 17	SQ 19
SQ 12	0.930				

	0.000				
SQ 13	0.907	0.881			
	0.000	0.000			
SQ 17	0.855	0.843	0.953		
	0.000	0.000	0.000		
SQ 19	0.761	0.722	0.742	0.794	
	0.000	0.000	0.000	0.000	
SQ 26	0.726	0.728	0.620	0.615	0.763
	0.000	0.000	0.001	0.001	0.000
SQ 33	0.961	0.913	0.852	0.822	0.812
	0.000	0.000	0.000	0.000	0.000
<hr/>					
SQ 26					
SQ 33	0.763				
	0.000				

Note. Cell Contents
 Pearson correlation
 *P-Value

Based on the survey data focused on training and accountability, research question two survey results for both employees and leaders positively correlate with standard work consistency and years of experience with the organization. Also, all of the results indicate a statistically significant positive correlation with years of experience with the organization with the exception of survey question 26. Survey question 26 states: I follow the standard work more closely if I know my supervisor is going to audit the area. While there is a positive correlation, the p-value indicates it is not statically significant with this outlier. The scatterplots of this correlation can be found in Figure G1 for employee results and Figure G2 for leader results. As the years of experience of employees increases so does training and accountability in impacting standard work adherence from both a leader and employee perspective.

Figure G1. Employee Sample Population - Research Question Two – Years of Experience with the Organization

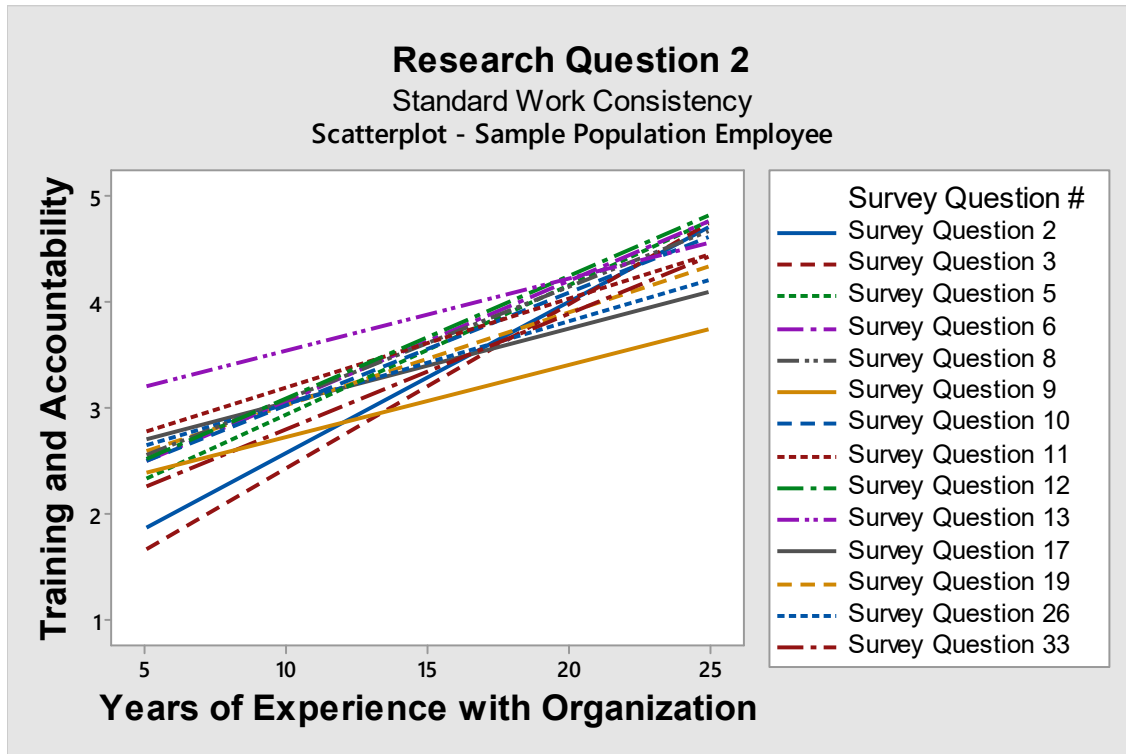


Figure G1. Research question two scatterplot graph of the employee sample population and years of experience with the organization. The graph illustrates that training and accountability are positively correlated with years of experience with the organization in relation to standard work consistency.

Figure G2. Leader Sample Population - Research Question Two – Years of Experience with the Organization

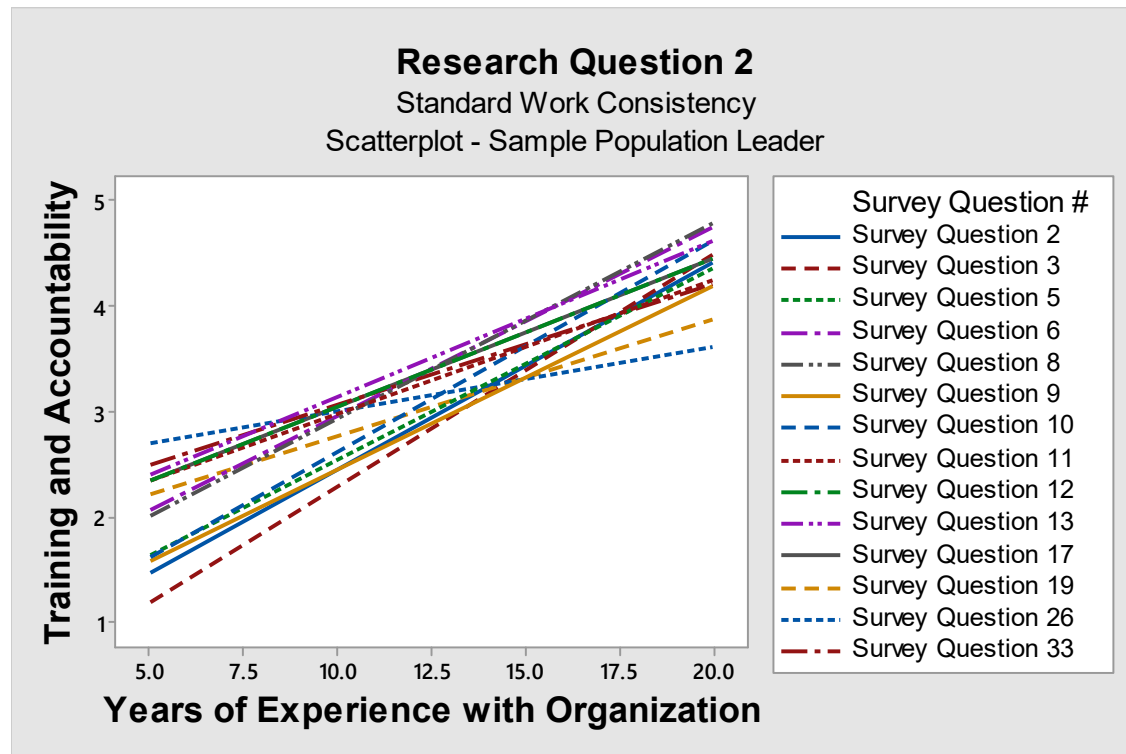


Figure G2. Research question two scatterplot graph of the leader sample population and years of experience with the organization. The graph illustrates that training and accountability are positively correlated with years of experience with the organization about standard work consistency.

In addition, training and accountability influence of standard work consistency for both employees and leaders positively correlated with the maturity of the manufacturing plant. An increase in the age of the plant will have an increase in training and accountability influenced standard work consistency. The scatterplots of this correlation can be found in Figure G3 for employee results and Figure G4 for leader results. A positive correlation is found in responses from both the leader and employee sample populations. As the maturity of the plant increases so does training and accountability in impacting standard work consistency from both employee and leader perspectives.

Figure G3. Employee Sample Population - Research Question Two – Plant Stage of Development

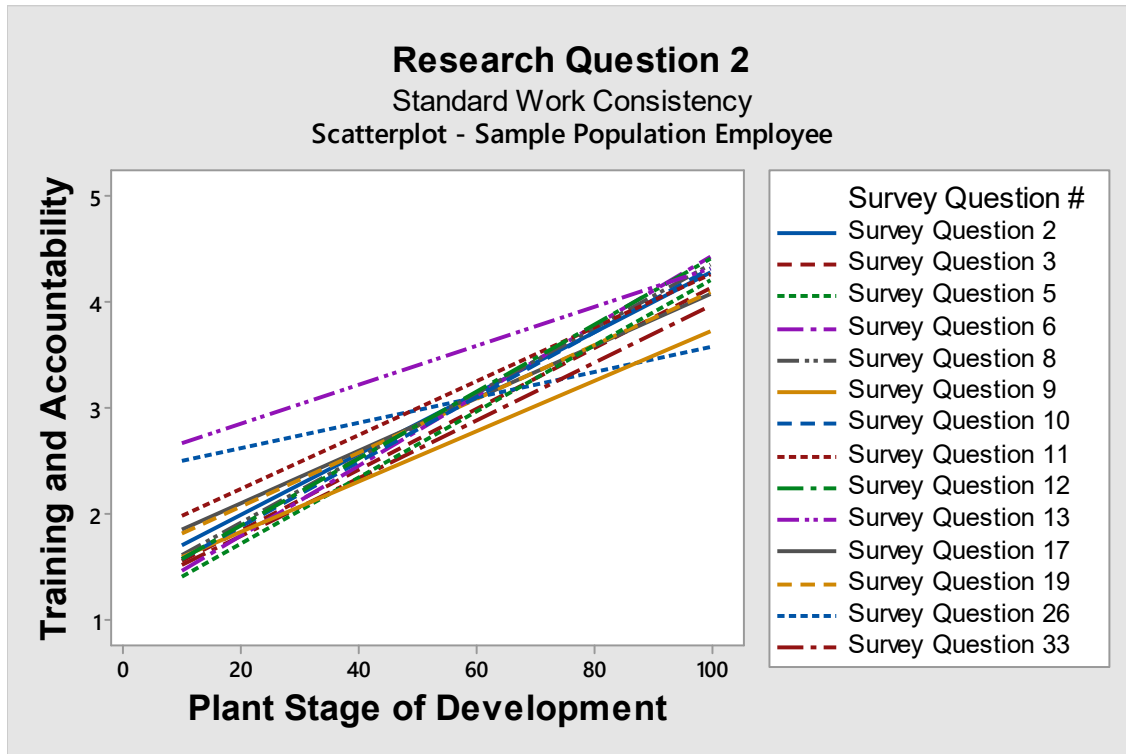


Figure G3. Research question two scatterplot graph of the employee sample population and plant tenure or stage of development. The graph illustrates that training and accountability are positively correlated with plant stage of development with the organization in relation to standard work consistency.

Figure G4. Leader Sample Population - Research Question Two – Plant Stage of Development

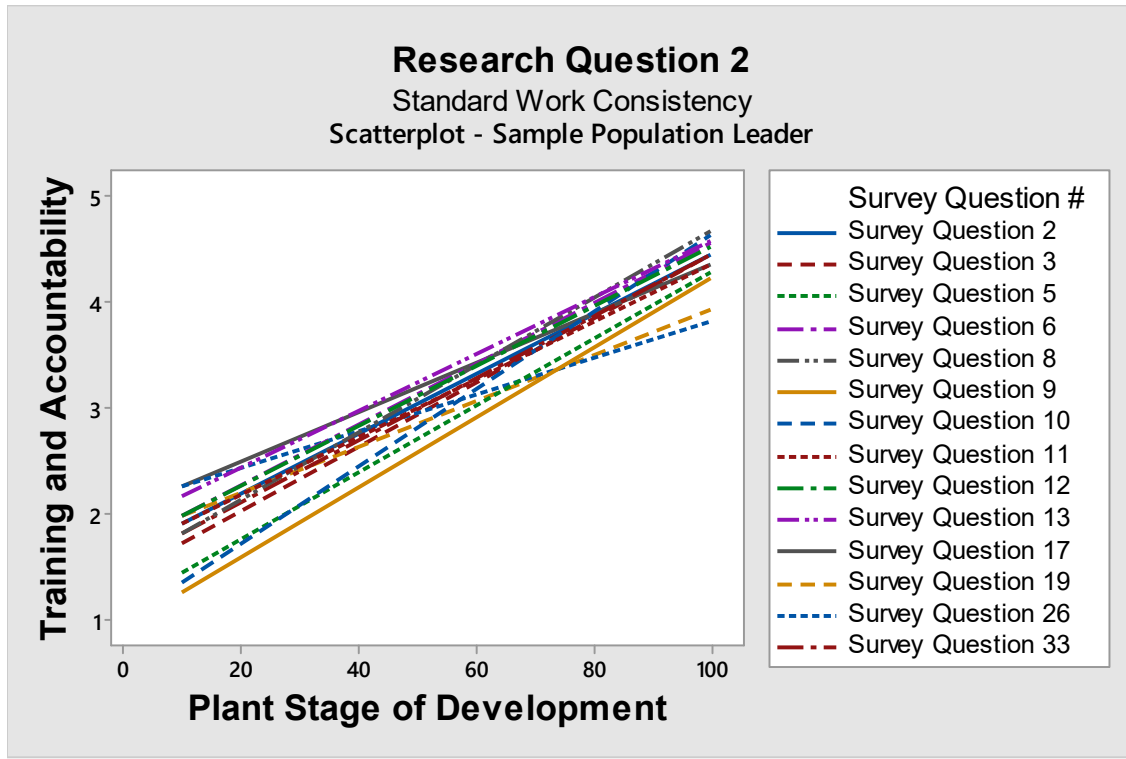


Figure G4. Research question two scatterplot graph of the leader sample population and plant tenure or stage of development. The graph illustrates that training and accountability are positively correlated with plant stage of development with the organization in relation to standard work consistency.

Appendix H

Research Question Three

Do organizational culture and employee engagement factors contribute to standard work consistency?

The Pearson correlation is utilized to examine the linear relationship between variables (Minitab Express Support, 2017). Within a coefficient range of -1 to +1, the larger the absolute value of the coefficient the stronger the relationship between variables (Minitab Express Support, 2017). When the variables increase or decrease together, the coefficient is positive and has an upward line slope on the scatterplot graph. The results of the research indicate the variables studied positively correlate with standard work consistency. In addition to the Pearson correlation which indicates the linear relationship, the p-value determines if the correlation coefficient is statistically significant (Minitab Express Support, 2017). When the p-value is less than or equal to the significance level, the correlation is statistically significant (Minitab Express Support, 2017). The significance level utilized in this study was 0.05.

Research question three for both the employee sample population and the leader sample population survey results indicate organizational culture and employee engagement positively correlates with standard work consistency. The Pearson correlation coefficient along with the p-value for the employee sample population are in Table H1 and Table H2 for the leader sample population. All responses for research question three indicate a positive correlation exists. In addition, all survey questions associated with research question three were statistically significant. Based on the correlation results, a positive relationship exists between organizational culture and employee engagement and standard work consistency. The results indicate that as organizational culture and employee engagement increases, standard work consistency increases.

Table H1

Employee Population Research Question Three Correlation: Quality Level, Years of Experience with Organization, Plant Status (Stage of Development), Survey Questions 4, 7, 15, 16, 20, 27, 28, 29, 34

	Quality Level	Years w Org	Plant Status	SQ 4	SQ 7
Years w Org	0.483				
	0.000				
Plant Status	0.864	0.488			
	0.000	0.000			
SQ 4	0.772	0.407	0.862		
	0.000	0.000	0.000		
SQ 7	0.799	0.400	0.907	0.898	
	0.000	0.000	0.000	0.000	
SQ 15	0.727	0.443	0.843	0.825	0.840
	0.000	0.000	0.000	0.000	0.000
SQ 16	0.793	0.486	0.880	0.828	0.842
	0.000	0.000	0.000	0.000	0.000
SQ 20	0.828	0.464	0.873	0.860	0.895
	0.000	0.000	0.000	0.000	0.000
SQ 27	0.614	0.368	0.674	0.773	0.690
	0.000	0.000	0.000	0.000	0.000
SQ 28	0.830	0.407	0.714	0.681	0.714
	0.000	0.000	0.000	0.000	0.000
SQ 29	0.836	0.416	0.684	0.672	0.696
	0.000	0.000	0.000	0.000	0.000
SQ 34	0.811	0.449	0.891	0.863	0.903
	0.000	0.000	0.000	0.000	0.000
	SQ 15	SQ 16	SQ 20	SQ 27	SQ 28
SQ 16	0.940				
	0.000				
SQ 20	0.804	0.862			

	0.000	0.000			
SQ 27	0.732	0.715	0.699		
	0.000	0.000	0.000		
SQ 28	0.706	0.718	0.679	0.606	
	0.000	0.000	0.000	0.000	
SQ 29	0.700	0.735	0.702	0.592	0.960
	0.000	0.000	0.000	0.000	0.000
SQ 34	0.848	0.851	0.861	0.666	0.748
	0.000	0.000	0.000	0.000	0.000
<hr/>					
	SQ 29				
SQ 34	0.740				
	0.000				

Note. Cell Contents
 Pearson correlation
 *P-Value

Table H2

Leader Population Research Question Three Correlation: Quality Level, Years of Experience with Organization, Plant Status (Stage of Development), Survey Questions 4, 7, 15, 16, 20, 27, 28, 29, 34

	Quality Level	Years w Org	Plant Status	SQ 4	SQ 7
Years w Org	0.481				
	0.011				
Plant Status	0.879	0.469			
	0.000	0.014			
SQ 4	0.715	0.629	0.797		
	0.000	0.000	0.000		
SQ 7	0.821	0.683	0.867	0.802	
	0.000	0.000	0.000	0.000	
SQ 15	0.750	0.521	0.904	0.782	0.854
	0.000	0.006	0.000	0.000	0.000
SQ 16	0.750	0.521	0.904	0.782	0.854
	0.000	0.006	0.000	0.000	0.000
SQ 20	0.648	0.513	0.857	0.746	0.812
	0.000	0.007	0.000	0.000	0.000
SQ 27	0.603	0.452	0.733	0.839	0.622
	0.001	0.018	0.000	0.000	0.000
SQ 28	0.766	0.547	0.766	0.781	0.612
	0.000	0.012	0.000	0.000	0.004
SQ 29	0.944	0.575	0.944	0.797	0.800
	0.000	0.008	0.000	0.000	0.000
SQ 34	0.832	0.550	0.865	0.808	0.818
	0.000	0.003	0.000	0.000	0.000
	SQ 15	SQ 16	SQ 20	SQ 27	SQ 28
SQ 16	0.980				
	0.000				

SQ 20	0.919	0.919			
	0.000	0.000			
SQ 27	0.703	0.650	0.652		
	0.000	0.000	0.000		
SQ 28	0.789	0.763	0.723	0.795	
	0.000	0.000	0.000	0.000	
SQ 29	0.917	0.917	0.835	0.736	0.875
	0.000	0.000	0.000	0.000	0.000
SQ 34	0.854	0.836	0.781	0.689	0.850
	0.000	0.000	0.000	0.000	0.000
<hr/>					
SQ 29					
SQ 34	0.907				
	0.000				

Note. Cell Contents
 Pearson correlation
 *P-Value

Based on the survey data focused on organizational culture and employee engagement, research question three survey results for both employees and leaders positively correlate with standard work consistency and years of experience with the organization. Also, all of the results indicate a statistically significant positive correlation with years of experience with the organization. The scatterplots of this correlation can be found in Figure H1 for employee results and Figure H2 for leader results. As the years of experience of employees increases so does organizational culture and employee engagement in impacting standard work adherence from both a leader and employee perspective.

Figure H1. Employee Sample Population - Research Question Three – Years of Experience with the Organization

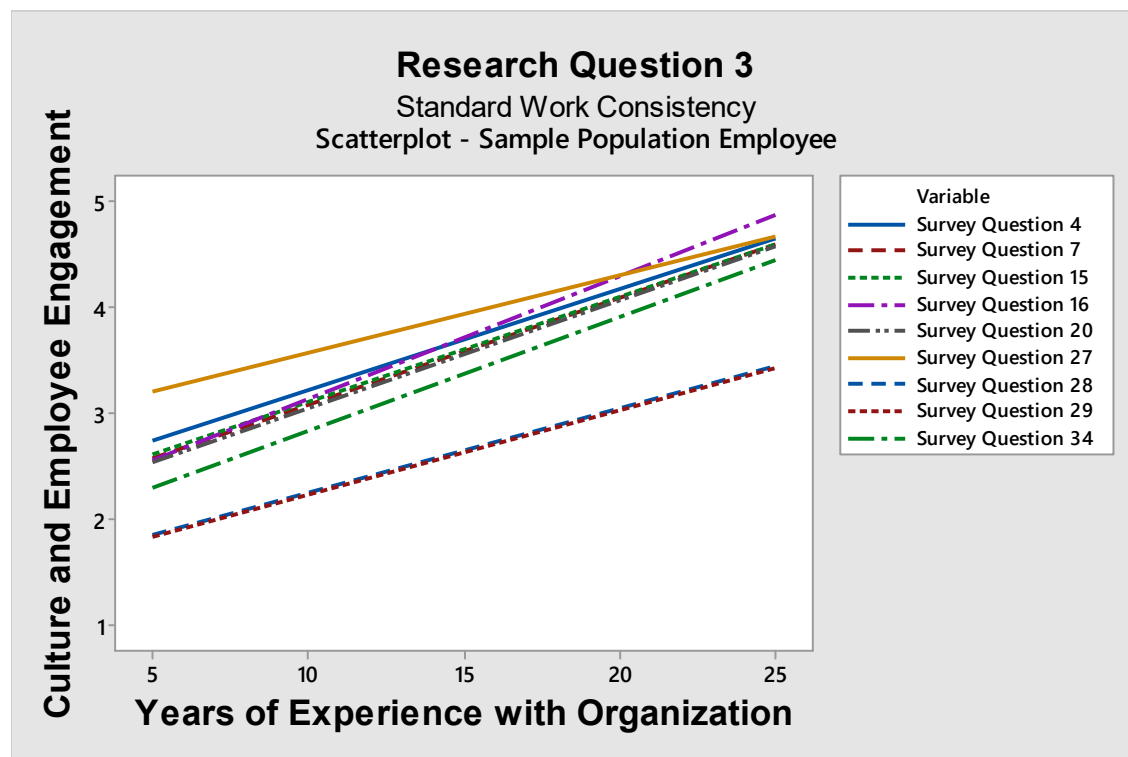


Figure H1. Research question three scatterplot graph of the employee sample population and years of experience with the organization. The graph illustrates that organizational culture and employee engagement is positively correlated with years of experience with the organization in relation to standard work consistency.

Figure H2. Leader Sample Population - Research Question Three – Years of Experience with the Organization

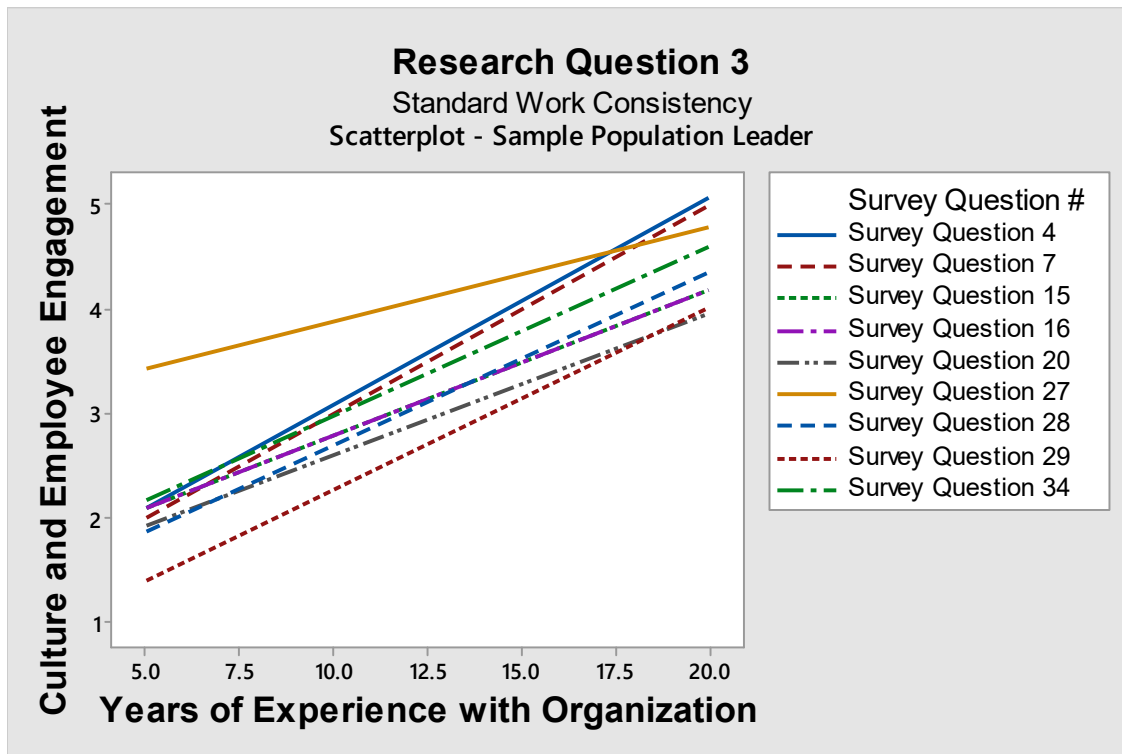


Figure H2. Research question three scatterplot graph of the leader sample population and years of experience with the organization. The graph illustrates that organizational culture and employee engagement is positively correlated with years of experience with the organization in relation to standard work consistency.

In addition, organizational culture and employee engagement influence of standard work consistency for both employees and leaders positively correlated with the maturity of the manufacturing plant. An increase in the age of the plant will have an increase in organizational culture and employee engagement influenced standard work consistency. The scatterplots of this correlation can be found in Figure H3 for employee results and Figure H4 for leader results. A positive correlation is found in responses from both the leader and employee sample populations.

As the maturity of the plant increases so does organizational culture and employee engagement in impacting standard work consistency from both employee and leader perspectives.

Figure H3. Employee Sample Population - Research Question Three – Plant Stage of Development

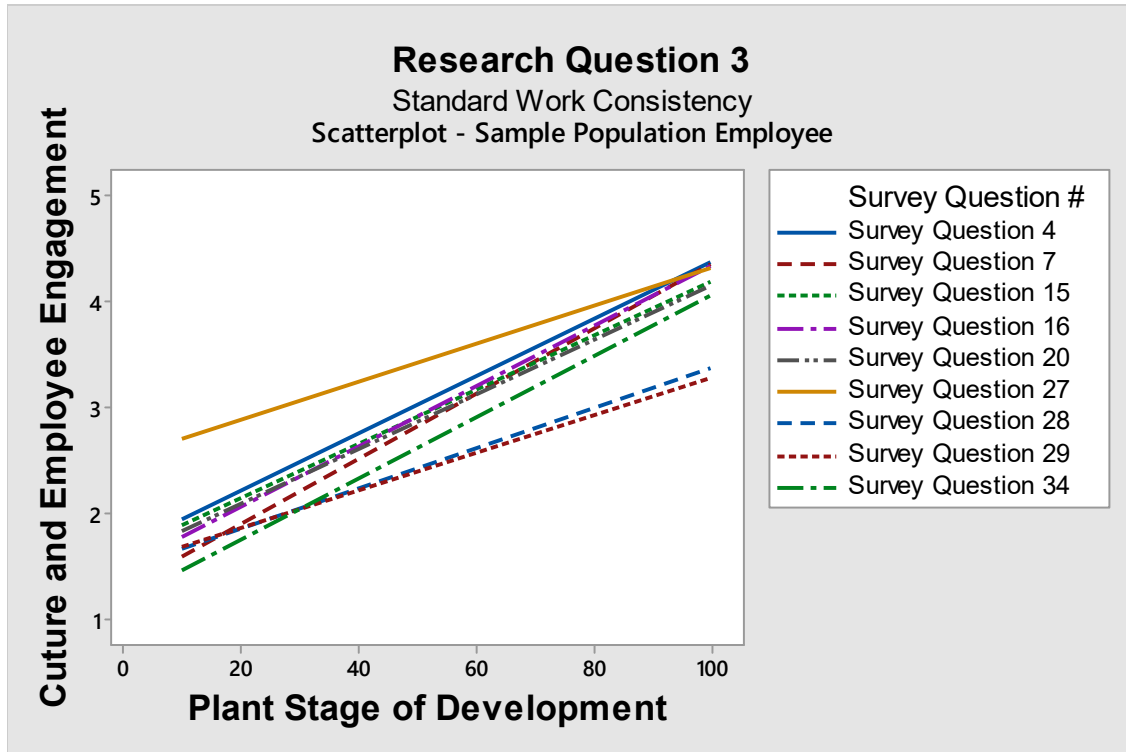


Figure H3. Research question three scatterplot graph of the employee sample population and plant tenure or stage of development. The graph illustrates organizational culture and employee engagement is positively correlated with plant stage of development with the organization in relation to standard work consistency.

Figure H4. Leader Sample Population - Research Question Three – Plant Stage of Development

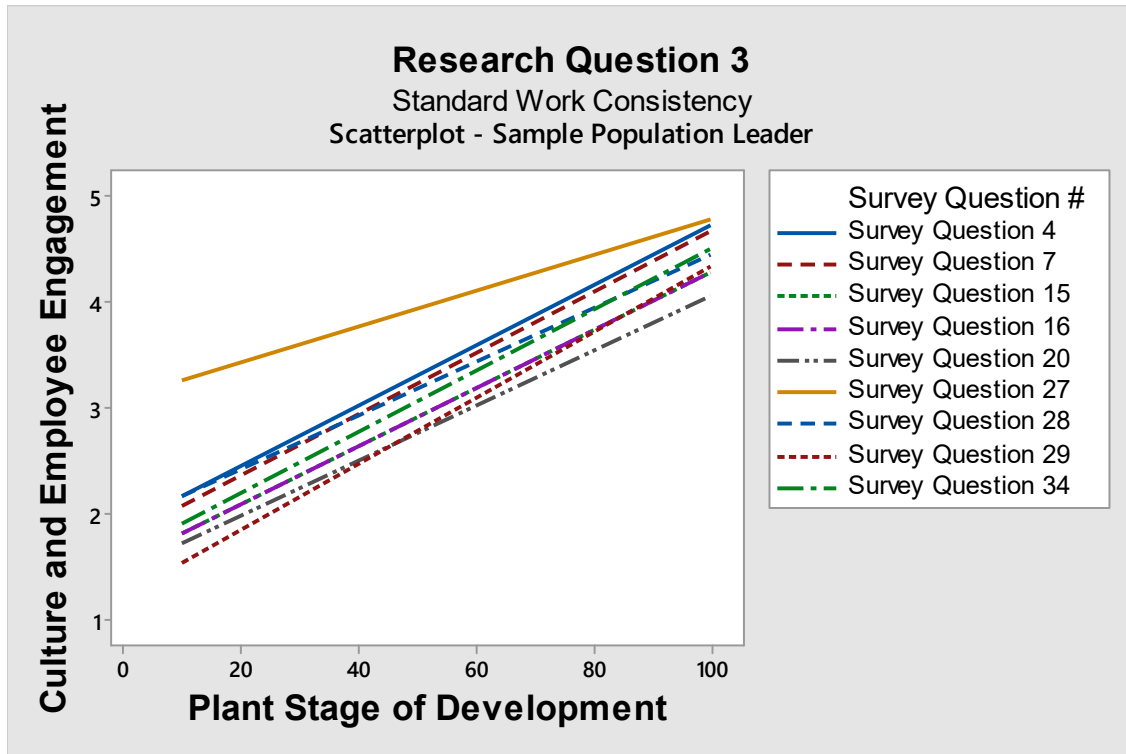


Figure H4. Research question three scatterplot graph of the employee sample population and plant tenure or stage of development. The graph illustrates that organizational culture and employee engagement is positively correlated with plant stage of development with the organization in relation to standard work consistency.

Appendix I

Word Frequency Clouds

After the survey questions associated with the respective research questions were analyzed, the data collected from the observation and interview information was analyzed. From the open-ended commentary section of the survey, observation notes, and interview responses information collected was entered into NVivo Plus. Information collected from the open-ended commentary section of the survey, observation notes, and interview responses was entered into NVivo 12 Plus by QSR International. All commentary and notes were coded both automatically and manually for analysis. The automatic coding was created based on observation and interview responses. The manual coding was created based on identifying quality-focused manufacturing leadership, training and accountability, and organizational culture and employee engagement factors associated with the standard work level of consistency.

Word Frequency Queries were performed with both automatic and manual coded data provided by the observations and interviews. The word cloud displayed in Figures 9, 10, and 11 with additional Figures in Appendix I provides the results indicating common themes and factors associated with standard work. The more prominent the word, the more often it appears in the observation data. The interpretation is that quality standard work is found during the production of customer products and supported by leadership (supervisor) and employees (employee engagement), with training of documented expectations.

The analysis of the observations and interviews using the word frequency queries supports the finding that standard work execution consistency is related to quality-focused manufacturing leadership, training and accountability, and organizational culture and employee engagement. The word clouds displayed in Figures 9, 10, and 11 with additional Figures in

Appendix I provides the results of observations and interviews both individually and combined. The themes indicated from both NVivo auto coding and researcher manual coding are consistent with the survey results as shown in the word frequency clouds. The analysis indicated the themes associated with standard work at high, medium, and low levels of standard work execution consistency. The more consistent the standard work as shown in the high execution level of Figure I5, the more prominent the 'standard work' displays in the word frequency cloud. The themes are identified in the various word frequency queries are consistent as shown in the word frequency cloud figures.

Figure I1. Word Frequency Cloud Auto Coded for Sentiment



Figure I1. Word frequency cloud created using auto-generated coding of both observations and interviews for the node sentiment which contains content that has both positive and negative emotions. Words are displayed under the criteria to display 100 of the most frequent words found in data that has a minimum string of three words with a grouping using stemmed words.

Figure 18. Word Frequency Cloud for both Observations and Interviews Auto & Manual Code



Figure 18. Word frequency cloud created using both manual and auto-generated coding of both observations and interviews. Words are displayed under the criteria to display 1000 of the most frequent words found in data that has a minimum string of three words with a grouping using stemmed words.

Appendix J

Hierarchy Charts

Hierarchy charts generated from auto coded observation and interview data provided additional support to the findings from the Pearson correlation and work frequency clouds. Appendix J contains three charts. Figure J1 is the hierarchy chart for a combination of both auto coded observations and interviews, Figure J2 is the hierarchy chart for the auto coded observations, and Figure J3 is the hierarchy chart for auto coded interview data. The auto coded output provided in the hierarchy charts reflects the same general themes identified in the research questions via the survey, observations, and interviews.

Triangulating the data was executed utilizing the survey results and the word frequency queries, and the hierarchy charts for both the observations and interviews. The researcher reviewed the Pearson correlation results which identified an overall positive correlation with standard work execution consistency and quality-focused manufacturing leadership, training and accountability, and organizational culture and employee engagement. In addition, the survey analysis indicated a positive correlation existed when the year of experience with the organization was included. The same was found with the maturity of the facility or years of operating. The finding was found to be consistent for both the employee sample population and leader the sample populations.

Figure J2. Hierarchy Chart for Auto Coded Observations

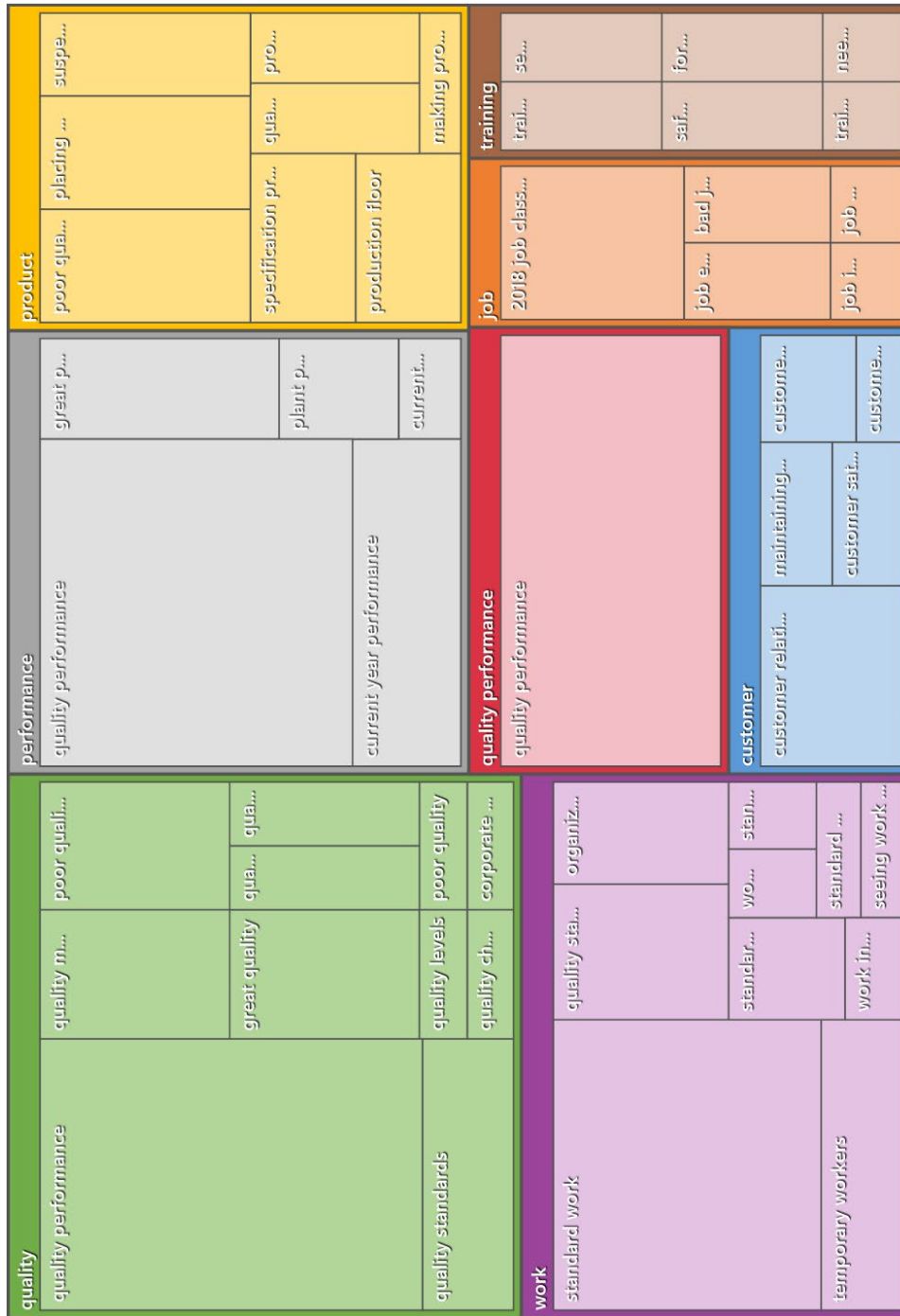


Figure J2. Hierarchy chart auto-generated from observation inputs. General themes are standard work, production, performance, quality, training, and checks. Looking at the next level this hierarchy chart supports the concept of quality-focused manufacturing leadership, training and accountability, and organizational culture and employee engagement elements are a component of standard work consistency.

