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Lean and its impact on employee empowerment within a higher education institution

Bernadette J. Barber

LEAN AND ITS IMPACT ON EMPLOYEE EMPOWERMENT WITHIN A HIGHER EDUCATION INSTITUTION

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Bernadette J. Barber

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BERNADETTE J. BARBER

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Date_____

Faculty Committee

_____
Committee Chair, Miriam Lacey, Ph. D.

_____
Committee Member, Terri D. Egan, Ph. D.

_____
Linda Livingstone, Ph. D., Dean
The George L. Graziadio School of Business and Management

Abstract

Institutions of higher education have been faced with economic challenges, funding shortfalls, endowment declines, layoffs, academic program cuts, rising tuition, and stiff global competition. These challenges are taking place at a time when students and other higher education constituencies are adding the pressure of consumer choice while expecting more responsive and comprehensive services, integrated use of technology, and managed costs. For some educational institutions, Lean—a total quality management approach—has become a tool for managing these challenges and expectations. Lean proponents also have suggested that incorporating Lean principles and processes results in higher levels of employee empowerment.

The purpose of this study was to examine the impact of Lean on employee empowerment within a higher education institution. This study was designed to discover higher education employees' attitudes toward Lean, to understand experiences and sources of empowerment, and to identify the relationship between Lean and empowerment so that higher education administration can implement Lean using best principles and practices, while preparing for related demands and outcomes.

A mixed method quantitative and qualitative research approach was utilized at a single institution of higher education. An online survey was administered to employees to collect information about the participants' background and Lean experience along with their perceptions of Lean and level of empowerment. One hundred fifteen employees responded to the survey. In addition, 10 one-on-one interviews were conducted to gather perceptions about Lean and empowerment.

This study found that employees believe Lean serves a legitimate role in higher education and is beneficial and relevant, encouraging cross-departmental collaboration, shared knowledge, and increased efficiencies. Perceptions of organizational alignment with Lean and personal buy-in and impact of Lean were found to be more strongly enhanced through direct participation in Lean rather than through simply engaging in Lean training.

Higher education employees most commonly interpreted empowerment as the authority and responsibility of owning a process or program, as well as the ability to make decisions and implement change. Lean was found to have a positive influence on the impact dimension of empowerment in a higher education setting. This study supports the assertion that Lean enhances employee empowerment by involving employees and giving them direct influence and impact in their work processes and outcomes.

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Chapter 1

Introduction

Lean is a total quality management (TQM) approach designed to identify and eliminate waste and encourage continuous improvement in organizations (Andersson, Eriksson, & Torstensson, 2006). Lean involves conducting *kaizens*, intensive team sessions intended to review work processes and make continuous, incremental improvements (Balzer, 2010; Dahlgaard & Dahlgaard-Park, 2006). The literal definition of kaizen is *change for the better* (Emiliani, 2006). Organizations choose Lean for a variety of reasons, such as reducing expenses, eliminating silos and enhancing coordination throughout the organization, improving communication and efficiency, and developing high quality products and services (Abdi, Shavarini, & Hoseini, 2006; Clayton, 1995; Comm & Mathaisel, 2005). The effects of Lean on these aspects of organizational functioning have been well researched and the evidence is strong that Lean does have a positive lasting effect in these regards (Abdi et al., 2006; Chowdhury, Paul, & Dan, 2007; Miller, 2005).

Additionally, Lean proponents claim that implementing Lean results in higher levels of empowerment throughout the organization (Dahlgaard & Dahlgaard-Park, 2006). However, research to substantiate this claim has been limited and inconclusive (Brah, Wong, & Rao, 2000; Hill & Huq, 2004; Vidal, 2007; Yeh, 2003). It is uncertain whether Lean actually causes empowerment to increase, whether any observed increases in empowerment occur by chance, or whether the impacts on empowerment are the result of some other variable (e.g., intervention design, increased leadership attention, employee involvement).

Without this clarity, a range of unexpected or adverse outcomes could result for organizations that undertake Lean initiatives. For example, if Lean does enhance empowerment, organizations implementing Lean need to be prepared for the associated demands. For example, empowerment has varying effects across employees, including job satisfaction, stress, and entitlement (Paul, Niehoff, & Turnley, 2000; Vidal, 2007). Alternately, if organization leaders expect empowerment to increase as a result of implementing Lean when empowerment is not actually an outcome, the desired effects of the Lean implementation would not be fully realized. To avoid these outcomes, it is necessary to examine the effects Lean has on empowerment.

Both Lean and empowerment are of growing interest among institutions of higher education (Comm & Mathaisel, 2005), which have been faced with economic challenges, funding shortfalls, endowment declines, academic program cuts, rising tuition, and stiff global competition (Comm & Mathaisel, 2005; Ewell, 1993; Mullen, 1993). These challenges only multiplied during the 2008 economic downturn (Fischer, 2010; Wheeler, 2008). Simultaneously, these institutions have grappled with how to meet stakeholder demands for more responsive and comprehensive services, integrated use of technology, and managed costs (Comm & Mathaisel, 2005; Ewell, 1993; Kanji, Malek, & Tambi, 1999; Mullen, 1993). Faculty and administrators alike experience this tension as they are asked to do more with less (Comm & Mathaisel, 2005; Hines & Lethbridge, 2008).

Educational institutions have employed a variety of strategies to protect their bottom line, including layoffs, downsizing, and restructuring (Mullen, 1993). An unintended consequence of these protective measures has been employees

feeling a loss of control, reduced morale, and disempowerment (Mullen, 1993). Other institutions, meanwhile, have tried initiatives such as Lean to contain costs while maximally leveraging their workforces (Comm & Mathaisel, 2005; Hines & Lethbridge, 2008). Therefore, understanding the impact of Lean on empowerment is of particular importance to higher education institutions.

Purpose of the Study

The purpose of this study was to examine the impact of Lean on employee empowerment within a higher education institution. The research questions were:

1. What are higher education employees' attitudes about Lean?
2. What are employees' interpretations of employee empowerment?
3. What are the influences of Lean on empowerment?

Research Setting

Research was conducted at ABC University, a private institution providing graduate-only education in three disciplines. Founded in 1947, the university is located in Southern California and has grown to include several West Coast regional campuses. In 2010, ABC enrolled approximately 4,000 students, with 500 faculty, administrators, and staff. The institution experienced layoffs and restructuring in 2009 as a response to the 2008 financial crisis and stock market crash, which resulted in a 25% decrease in endowments for the school. Based on employee feedback and engagement surveys conducted subsequent to that period, morale suffered and employees reported concerns regarding the future of higher education and a broader fear of the state of the economy.

Lean was introduced to ABC in 2005, began to gain momentum in 2008, and has since been implemented throughout the majority of the university. ABC

has committed to Lean business practices for the purposes of improving processes, reducing costs, eliminating waste, and enhancing services to its various customers. ABC has embraced Lean by including Lean initiatives in its strategic goals for 2009–2013. Goals include having Lean culture integrated into the organization and for managers to take ownership of Lean principles and integrate them into daily work (ABC University, 2011). In pursuit of these goals, a Lean Team was created, and over a 3-year period, ABC sent 13 employees to Lean University at the University of Central Oklahoma (UCO) to receive Lean training and a Lean Facilitator Certification. The current Lean Team includes 10 members from senior management, administrator, and staff-level positions, representing various academic and administrative divisions and departments from across the institution. Each member has committed to Lean responsibilities on top of regular job duties. Lean Team members facilitate cross-departmental kaizens that guide employees to make improvements to their work processes.

To further the goals of engaging managers, integrating Lean into the institution's culture, and applying Lean principles organization-wide, an institutional policy was created in February of 2010 that required each open job position to be reviewed using Lean principles and tools to consider how the job is structured and to provide the department an opportunity to shift workloads, improve workflow, and streamline processes. This approach was termed *functional analysis* by ABC University and consists of intensive team sessions in which Lean principles are used to review the current state of the job and department design and its functions, and to determine and put into place an

improved future state design. The functional analysis events also assist with identifying future Lean kaizen opportunities.

Significance of the Study

As Lean and employee empowerment are receiving increased attention in higher education settings, it is important to study the implications of applying Lean in higher education. Examining higher education employees' attitudes about Lean will generate principles and best practices for Lean implementation in higher education. Exploration of employees' interpretations of empowerment will provide understanding of experiences and sources of empowerment. Finally, identifying the relationship between Lean and empowerment will guide higher education administration to select the appropriate interventions and to prepare for related demands and outcomes.

Methodology

This study was conducted at ABC University using mixed method quantitative and qualitative research approaches. An online survey was created and administered to gather information about the participants' background and Lean experience along with their perceptions of Lean and level of empowerment. The survey sample consisted both of employees who had participated in the Lean effort at ABC and also those who had never been involved in Lean. For the qualitative portion of the research, a one-on-one interview script was designed and conducted to gather employee perceptions about Lean and empowerment from employees who had participated in a Lean kaizen or functional analysis. Data analysis was performed through frequency statistics, analysis of variance

(ANOVA), Spearman correlations, and identification of interview themes. Conclusions were drawn from the findings and implications discussed.

Overview of Thesis

This introduction in chapter 1 provided the context and purpose of this study—to examine the impact of Lean on employee empowerment within a higher education institution. Also included were a description of the research setting, the significance of the study, and a brief overview of the methodology.

Chapter 2 reviews research on Lean and its history and early connection to TQM, the definition of Lean, its critical success factors, and the characteristics of Lean in higher education. Chapter 2 also presents the literature on the nature of empowerment—its definition, employee-level antecedents, measurement tools, and its relationship to Lean.

Chapter 3 provides an outline of the research methods and design utilized in this study. The chapter includes the research design, sample selection, protection of human subjects, instrumentation development, data collection, data analysis procedures, and participant demographics.

Chapter 4 presents the study's findings and results. The chapter reports survey results, interview results, and synthesis of the data. Descriptive statistics, ANOVA results, Spearman correlations, and qualitative analysis were used to produce the results.

Finally, chapter 5 summarizes the findings and draws conclusions from the research. Study limitations, suggestions for further research, and recommendations for organization development practitioners also are explored.

Chapter 2

Literature Review

The purpose of this study was to examine the impact of Lean on employee empowerment within a higher education institution. The research questions were:

1. What are higher education employees' attitudes about Lean?
2. What are employees' interpretations of employee empowerment?
3. What are the influences of Lean on empowerment?

This chapter summarizes current literature on Lean, including its origins, founders and history, definitions of Lean, Lean critical success factors suggested for successful implementation, and unique applications of Lean in higher education. Literature on employee empowerment also is reviewed, including a definition of empowerment, its antecedents, tools for measuring empowerment, and Lean's effect on empowerment.

Lean History

Lean grew out of the quality movement that had its beginnings in America in the early and mid-1900s. Walter A. Shewhart, W. Edwards Deming, and Joseph M. Juran were the pioneers who developed and provided leadership to the modern quality movement. In Japan, Taiichi Ohno transformed their knowledge into what became the Toyota Production System. Following increased competition from the Japanese automotive industry, American industries began to study the Japanese quality approach, which resulted in the birth of TQM. Philip Crosby and H. James Harrington became practitioners and consultants, further defining and designing quality and business improvement approaches. An American researcher, John Krafcik, conducted an intensive study on the Toyota

Production System and in 1988 published an article describing it as “lean.” In 1991, Krafcik’s advisor, James P. Womack, picked up on this term and released a book articulating a system of lean quality and business improvement principles, resulting in the philosophy and tools of Lean. The following section provides a brief history of how Lean was created.

Pioneers of Quality

Walter A. Shewhart is known as the founder of the quality movement and the one who established statistically based quality management (Bisgaard, 2008; Sliwa & Wilcox, 2008). He developed statistical process control methods in the 1920s and his principles are captured in his book, *The Economic Control of Quality of Manufactured Product* (Shewhart, 1931). Shewhart believed that quality should be dependable and economic, which Deming (1967) referred to as quality suited to the purpose.

W. Edwards Deming was another pioneer of the quality movement and was greatly influenced by Shewhart’s work (Landesberg, 1999). A mathematician and a statistician, Deming was invited to Japan in 1950 by the Union of Japanese Scientists and Engineers, to help the country rebuild following the destruction of World War II. In Japan, Deming educated engineers about Shewhart’s statistical process control methods (Harrington, 1995). He taught the Japanese how to view production from a systems perspective and emphasized the importance of leaders managing the quality process (Harrington, 1995; Landesberg, 1999). Deming was a catalyst for Japan’s industrial rise and its entry and prominence into worldwide competition and success (Landesberg, 1999). In 1950, the Union of Japanese Scientists and Engineers created a prize to honor Deming’s

contributions. The coveted Deming Prize is awarded annually to companies that have “exerted an immeasurable influence directly or indirectly on the development of quality control and management in Japan” (The W. Edwards Deming Institute, n.d., para. 3).

In his book, *Out of the Crisis*, Deming (2000) identified “lack of constancy of purpose to plan” as a critical affliction in most businesses (p. 97). Deming emphasized the importance of managers establishing their constancy of purpose and then communicating this aim so that it is clear and supported by all employees (Deming, 2000; Landesberg, 1999). Constancy of purpose for improvement of product and service became the first of Deming’s 14 Points for Management (see Appendix A) to assist leaders to achieve quality and transform their organizations. Deming introduced the idea of applying quality improvements into manufacturing and production, as well as with service sectors, such as restaurants, hotels, banks, insurance, government, and education (Deming, 2000).

Joseph M. Juran, a contemporary of Deming, also spent years visiting Japan and teaching organizations how to manage for quality (Gaboury, 1999; Landesberg, 1999). He helped the Japanese apply statistical tools to eliminate defects, implement quality planning, and identify root causes for poor quality (Bisgaard, 2008; Leong & Eng, 1997). Juran defined quality as *fitness for use*, which is similar to Shewhart’s definition of quality suited to the purpose. Juran excelled at coaching management to set quality goals and conduct planning, and he also encouraged good group process to instigate quality improvement suggestions from employees (Juran, 1989; Lawler, 1986). The “Juran Trilogy” on

quality planning, control, and improvement, are outlined in his book, *Juran on Leadership for Quality* (Juran, 1989).

The Birth of TQM

The figure who synthesized the work of Shewhart, Deming, and Juran and translated it into what eventually became TQM and Lean is Taiichi Ohno, the chief production engineer at Toyota Motor Company. Described as a *production genius*, Ohno partnered with one of Toyota's founders, Eiji Toyoda, to design new production principles and methods that saved Toyota from economic collapse and pushed the car company to a global market quality leader (Womack, Jones, & Roos, 1991). In contrast to American mass-market assembly-line production, popularized by Henry Ford, Ohno discovered success in counterintuitive production approaches such as small batching to save costs, just-in-time inventory, and stopping the line at the point of error rather than waiting to discover mistakes during quality control checks at the end of the line (Womack et al., 1991). Ohno also developed the concept of quality circles and introduced the *kaizen*, a continuous, incremental improvement process (Dahlgaard & Dahlgaard-Park, 2006). Over a 20-year period, Ohno and Toyoda developed and implemented their production philosophy and practice. Their approach became known as the Toyota Production System (Dahlgaard & Dahlgaard-Park, 2006; Womack et al., 1991).

The two key tenets of the Toyota Production System are continuous improvement and respect for people (Emiliani, 2006). Ohno achieved continuous improvement through the technical systems he employed. He also understood the importance of respect for people when he realized that his workforce was

most productive when it was highly skilled and motivated (Womack et al., 1991). Ohno focused on developing his staff, providing task variety, increasing job involvement, and extending responsibility to employees to collectively improve their work processes. The foundation of the Toyota Production System was leadership and empowerment through education and training (Dahlgaard & Dahlgaard-Park, 2006). He believed strong leadership was required to manage Toyota's teams and to execute continuous improvement and respect for people (Womack et al., 1991).

As Toyota became a competitor and threat to the American automobile market, American corporations took notice and began to study the Toyota Production System, as well as the quality management approaches Deming and Juran had been advocating (Bisgaard, 2008; Dahlgaard & Dahlgaard-Park, 2006; Womack et al., 1991). The TQM approach that arose from these conditions became an evolving management system of values, practices, and tools, existing to increase external and internal customer satisfaction with reduced resources (Andersson et al., 2006). TQM has been defined as "a company culture characterized by increased customer satisfaction through continuous improvements, in which all employees actively participate" (Dahlgaard & Dahlgaard-Park, 2006, p. 266). TQM also is understood as a holistic management philosophy that relates to all processes in all industries, guiding organization cultures from passive and defensive to proactive and open. Flowing from the Toyota Production System approach of giving responsibility to employees to collectively improve their work processes, TQM delegates responsibility to all levels of employees providing them with the appropriate

authority and capability to manage quality improvements. The Toyota Production System and TQM also share a requirement for highly involved and supportive leadership (Dahlgaard & Dahlgaard-Park, 2006).

Philip Crosby furthered the TQM conversation through his four quality management absolutes: (a) the definition of quality is conformance to requirement, (b) the system of quality is prevention, (c) the performance standard is zero defects, and (d) the measurement of quality is the price of nonconformance (Crosby, 1995). Crosby contended that variations, deviations, rework, and corrective action are more costly to a manufacturing or service organization than leadership may realize or acknowledge and that a zero defects program is the most cost effective approach (Crosby, 1979, 1995). In his book, *Quality Without Tears*, Crosby (1995) argued that quality is about doing it right the first time and that the absolutes of quality management should be led by management and practiced by all employees of an organization, not just understood by the quality department. Crosby designed his own 14 Steps (see Appendix B) to quality improvement—guiding management and involving all employees through the process (Crosby, 1979) .

Conducting a review of Deming, Juran, and Crosby's quality philosophies and approaches, Harrington (1995) asserted that quality confusion and improvement dilemmas exist across the TQM landscape. He suggested that customers do not want *quality*, doing the job right every time, they want *perfection*, doing the right job every time (Harrington, 1991). He proposed that customers evaluate their total interface and experience with the organization, not just the delivered product or service; accordingly, examining the production

process alone is insufficient. Therefore, he argued against a single focus on quality and identified additional measurements such as improved reliability, increased response time, decreased cost, expanded market share, greater customer satisfaction, and, ultimately, increased profits (Harrington, 1991, 1995). Harrington introduced the concept of business process improvement and defined business processes as all the processes in an organization that use material, equipment, and people for various outputs and services (Harrington, 1991). Along with Deming, Juran, and Crosby, Harrington placed the burden and responsibility for improvement with management and stated that leadership must set the example and model business process improvement (Harrington, 1995).

The Birth of Lean

It is in this environment of TQM that John Krafcik, a NUMMI engineer and researcher at MIT's Sloan School of Management, returned back to the source of the Japanese automotive success, the Toyota Production System. He received training in the system, studied its practices, and then coined the term "lean" to describe its methodology. In an article entitled, "Triumph of the Lean Production System," Krafcik (1988) applied the word lean to reflect that the Toyota Production System uses fewer hours, people, and resources while creating better products (Womack et al., 1991). At the time when Krafcik coined lean in 1988, he was a member of a research team led by James P. Womack. Soon after, Womack published *The Machine that Changed the World* (Womack et al.,1991) and later *Lean Thinking* (Womack & Jones, 2003), which introduced the philosophy and tools of Lean, based on the practices of the Toyota Production System.

Lean spread from automotive and manufacturing to service industries, health care, government, and education (Abdi et al., 2006; Balzer, 2010; Hasenjager, 2006; Miller, 2005; Radnor, 2009). While initially applied in manufacturing environments, research has shown that Lean also is beneficial in service industries (Abdi et al., 2006). According to Abdi et al., all organizations, manufacturing and service, are a compilation of operations and processes designed to deliver a product and/or service. While challenges in manufacturing processes may relate to the nuts and bolts of production, challenges for both manufacturing and service organizations present themselves through people and behaviors, such as inconsistent responsiveness, inaccurate delivery of information, or disparate communication and workflow (Abdi et al., 2006, Harrington, 1991, 1995).

Lean Defined

Lean and TQM share the same origin—the quality evolution in Japan after World War II (Andersson et al., 2006). TQM has been defined as “a company culture characterized by increased customer satisfaction through continuous improvements, in which all employees actively participate” (Dahlgaard & Dahlgaard-Park, 2006, p. 266). The National Institute of Standards and Technology defined Lean as “a systematic approach to identifying and eliminating waste through continuous improvement, flowing the product at the pull of the customer in pursuit of perfection” (Andersson et al., 2006, p. 283).

According to Lean and TQM, strong leadership is critical for supporting employees’ participation in continual improvements with limited resources to improve customer satisfaction (Andersson et al., 2006; Dahlgaard & Dahlgaard-

Park, 2006). Some researchers have suggested that Lean may be viewed as an improvement approach with concepts and tools that support the overarching principles and purposes of a TQM philosophy (Andersson et al., 2006; Dahlgaard & Dahlgaard-Park, 2006). From this perspective, Lean can be used to strengthen the values of TQM inside an organization (Andersson et al., 2006). Lean can be further understood by reviewing the implications of eliminating waste, customer satisfaction, and continuous improvement.

Eliminating Waste

Reducing waste is a core activity of Lean applied to any organization. Womack and Jones (2003) defined waste as, “any human activity which absorbs resources but creates no value” (p. 15). Across Lean literature, the definition of waste is oriented to the perception of value by the customer (Abdi et al., 2006; Dahlgaard & Dahlgaard-Park, 2006; Emiliani, 2006; Emiliani & Stec, 2005). Described as the *eight wastes*, these non-value added attributes in a product or service use up significant resources without a return and often result in defects, errors, and other inefficiencies (Womack et al., 1991). The UCO created the acronym DOWNTIME to represent the eight types of waste found in service organizations: defects, overproduction, waiting, not utilizing people or resources, transportation or travel, inventory, motion, and excess processing (Balzer, 2010). Another model categorizes types of waste into four general categories: people waste, process waste, information waste, and asset waste. By eliminating waste and removing steps in the process that are not valued by the customer, organizations can save time and money, while delivering higher quality products and services to their customers (Emiliani & Stec, 2005).

Customer Satisfaction

Since waste is defined throughout the literature as non-value added activity in the eyes of the customer, the next question to consider is who the customer is, with the intention of achieving customer satisfaction. One definition of customer is the end-user of the product or service (Abdi et al., 2006; Emiliani, 2006). Others believe there are both internal and external customers that need to be identified (Leong & Eng, 1997; Mullen, 1993). Mullen expanded the definition to include "each employee in the organization who is the recipient of work completed by another employee" (p. 99). With this broad view, supervisors, subordinates, and coworkers each have an opportunity to add value and reduce waste in their work, and they also can help define what they value or need in the process. In an interview, Joseph M. Juran stated that he would like to redefine *customer* to mean "all the people who are impacted by what we do" (Gaboury, 1999, p. 31). Juran went on to argue against the view that there is only one classification of customer, and that is *the end-user*.

Quality from a Lean perspective is delivering what the customer wants, according to customer-defined specifications (Leong & Eng, 1997). It is not adequate to simply produce a product or service that is perfect but does not meet customer requirements. Within the service industry, customer service is core and organizations must determine the expectations of the customer (Abdi et al., 2006). The Lean approach of providing value in the eyes of the customer also translates into delivering that for which they are willing to pay (Emiliani & Stec, 2005). Lean guides organizations to be customer-focused and responsive. Leong and Eng (1997) argued that customer focus leads to customer satisfaction and

then, ultimately, to customer loyalty. Their research also suggests that customer satisfaction is the most important prerequisite for high performing organizations.

Pursuing Continuous Improvement

The National Institute of Standards and Technology's definition of Lean contains the phrase "in pursuit of perfection" (Andersson et al., 2006, p. 283). While perfection itself may be impossible to achieve, this pursuit guides and commits an organization to continuous improvement (Abdi et al., 2006). A desire to achieve perfection provides hope, motivation, and discipline to continually look to reduce waste and to understand what the customer values. Continuous improvement leads to constant examination and monitoring of processes and services (Leong & Eng, 1997). Instead of this responsibility resting solely in a quality department, a continuous improvement methodology demands extensive employee involvement. When applying Lean, organizations train and encourage their employees to continually look to reduce waste, improve their work, and maximize the quality of the product or service as it is handed to the next customer. The rule is to only accept work products that conform to all specifications, without exception. When everyone complies with this rule, only quality products are produced throughout the system.

Lean Critical Success Factors

A review of Lean literature reflects mixed results on the success of Lean implementation. However, the literature is consistent in highlighting the factors that are present in organizations where Lean reduces waste, improves processes, and cuts costs. Critical success factors can be summarized by the

overall culture of the organization, the strength of leadership, and the involvement of teams and frontline staff.

Culture

For Lean to penetrate, organizations must be committed to creating a Lean culture and philosophy, not just to applying Lean techniques (Aiqiang, 2010; Atkinson, 2010). Nothing short of an enterprise-wide, comprehensive deployment of Lean can lead to organizational transformation (Bhasin & Burcher, 2006). This transformation changes how things are done and what people believe about getting things done—"as much mindset as method, and many believe it is a new management philosophy" (Mullen, 1993, p. 93). According to Bhasin and Burcher (2006), long-term commitment to the philosophy and practices of Lean is required and it can take medium-sized organizations 3 to 5 years to achieve results.

A Lean culture is a cooperative culture, infused with trust, open communication, collaboration, problem solving, and empathy (Bhasin & Burcher, 2006; Dahlgaard & Dahlgaard-Park, 2006). In a Lean organization, emotional competencies are valued as much as technical competencies (Dahlgaard & Dahlgaard-Park, 2006). Implementing Lean requires change management skills to transform processes, behaviors, and culture, and to obtain buy-in and support from organization members (Aiqiang, 2010; Bhasin & Burcher, 2006). Atkinson (2010) stated, "Change is not just a technical-rational process. It is a behavioral, emotional and political process" (p. 37). Achieving employee alignment is critical for successful implementation (Gagnon & Michael, 2003). Lean cannot be viewed as a canned program and there is not a single "best system" to deploy

(Schoengrund, 1996). When applying Lean, practitioners must recognize that "taking into consideration and acting upon the cultural specificity of the organization is central to a successful outcome" (Jones & Seraphim, 2008, p. 304).

Leadership

There are many cultural blocks that can limit Lean's influence on an organization. Silos and turf wars are primary obstacles for Lean (ASQ, 2008; Atkinson, 2010). A lack of leadership, vision, and planning also are key Lean inhibitors (Emiliani & Stec, 2005; Lucey, Bateman, & Hines, 2005). Strong leadership is a requirement to manage these obstacles and to develop a Lean culture across an organization (Pepper & Spedding, 2009). Psychological, financial, and political support are all necessary, and transformation is most effective when leadership connects the changes to an organization's vision, mission, and goals (Atkinson, 2010; Dahlgaard & Dahlgaard-Park, 2006).

Consistent with the teachings of Deming, Juran, Ohno, Crosby, and Harrington, leadership must not only guide the Lean changes but also model the behavior and teach the philosophy (ASQ, 2008; Chowdhury et al., 2007). Effective Lean implementations require high commitment from top management (Chowdhury et al., 2007; Pepper & Spedding, 2009). It is leadership's challenge to balance the human and economic objectives: positive, stable long-term growth is the goal (Emiliani & Stec, 2005). Lean demands both a top-down and bottom-up strategy, and sustained, proactive, two-way communication is central to support these strategies (Dahlgaard & Dahlgaard-Park, 2006; Lucey, Bateman, & Hines, 2004).

Employee Involvement

As part of the top-down strategy, leadership sets the Lean vision and puts the appropriate resources and structures in place. Leadership should communicate and engage employees in education and understanding of Lean (Gagnon & Michael, 2003). When leaders design the bottom-up strategy, Lean success is dependent on every employee's participation and commitment to reducing waste, satisfying the customer, and continually making improvements (Dahlgaard & Dahlgaard-Park, 2006). Lean is designed for all employees to participate, acquire new knowledge, contribute their expertise, make improvements to their processes, increase their self-respect, realize their full potential, take ownership of quality, and increase their commitment to the organization (Chowdhury et al., 2007; Emiliani & Stec, 2005). A culture of quality requires that frontline employees have the responsibility, accountability, and ownership of continuous improvement work (ASQ, 2008). Through their involvement in Lean, employees learn more about their organizations and customers—feeling a stronger connection to the mission (Brigham, 1993).

In some industries, it has been shown that employee involvement is a predictor of product quality (Chowdhury et al., 2007). Joseph M. Juran believed that those who produce the services and goods should be responsible for producing quality (Gaboury, 1999). Lean's predecessor, the Toyota Production System, was a human-based system that involved employees in creating continuous improvements, while maintaining a focus on leadership and empowerment through education and training (Dahlgaard & Dahlgaard-Park, 2006). In line with Taiichi Ohno's concept of respect for people, employees must

also be certain that their jobs are not at risk when creating organizational efficiencies (Emiliani, 2006). To engage employees in Lean and quality improvement, management must provide employees with tools, training, and the desire to improve their jobs (Leong & Eng, 1997). Using Lean to trim jobs undercuts the entire Lean process, reduces trust, and prevents employees from fully participating—thus, missing the opportunity for employee empowerment and organizational culture change (Pepper & Spedding, 2009).

Lean in Higher Education

Institutions of higher education have been faced with economic challenges, funding shortfalls, endowment declines, layoffs, academic program cuts, rising tuition, and stiff global competition. These challenges are taking place at a time when students and other higher education constituencies are adding the pressure of consumer choice while expecting more responsive and comprehensive services, integrated use of technology, and managed costs (Comm & Mathaisel, 2005; Ewell, 1993; Kanji et al., 1999; Mullen, 1993). For some educational institutions, Lean has become a tool for managing these challenges and expectations.

Fox Valley Technical College (in 1985), Oregon State University (in 1990), and then the North Dakota University System were among the first in higher education to adopt a quality improvement program (Mullen, 1993). Outside of the U.S., the United Kingdom's Aston University implemented quality circles in 1987 (Clayton, 1995). Another early adopter, the University of Wisconsin-Madison, maintains a well-defined continuous improvement process and established an Office of Quality Improvement (Hines & Lethbridge, 2008). The UCO took Lean a

step further and along with applying Lean principles across their own campus, the UCO also began Lean University, a program designed to teach Lean to other institutions of higher education (Balzer, 2010; Hines & Lethbridge, 2008). Lean has been implemented in both public and private institutions, working to balance the reality of limited resources with the demand for robust services.

Lean in the higher education context highly resembles its application in other industries. The use of the term *customer* and the specific structures of higher education are the primary differentiators for Lean in educational environments compared to traditional Lean environments. The literature consistently points out that higher education holds a discomfort and an aversion to the concept of customer (Ewell, 1993; Gaboury, 1999). And yet, identifying the customer is a core concept of Lean. Although hesitant to use customer, the broader definition of the term that is regularly used for Lean applies perfectly to higher education. Marchese (1993) described *external customers* as funders, donors, employers, and other learning institutions, and *internal customers* as students and employees. Put even more simply, customers are “the people down the hall who receive my work” (p. 10). Ewell (1993) suggested that *customer* be redefined to mean those who the faculty, administrators, and staff serve.

Brigham (1993) suggested that higher education requires its own framework when applying quality management. Higher education, steeped in traditional structures and systems, appears to be more change resistant than conventional Lean environments (Hines & Lethbridge, 2008). Comm and Mathaisel (2005) went as far as describing higher education as “one of the most immutable of institutions” (p. 134). Historically, higher education has been

hierarchical with complicated and complex structures, including tiered departments and disciplines, a multitude of committees, and fixed silos (Hines & Lethbridge, 2008; Marchese, 1993; Roffe, 1998). In his case study of TQM applied at Lehigh University, Likins (1993) described American universities as *multiuniversities*, operating with "diverse and conflicting purposes and objectives" (p. 23).

It is in this context of structural complexity that certain authors have questioned the applicability of Lean to higher education. They have warned against direct application of approaches learned from other industries, and have inquired whether Lean has the ability to make changes to higher education's core processes—education and research (Ewell, 1993; Koch & Fisher, 1998; Roffe, 1998). Across the literature, most acknowledge that Lean is regularly applied to administrative and operations systems but not to classrooms or curricula (Brigham, 1993; Comm & Mathaisel, 2005; Marchese, 1992; Mullen, 1993). Only believing Lean to be marginally useful to higher education, Koch and Fisher (1998) described these administrative improvements as pedestrian and lacking meaningful significance. In contrast, Marchese (1992) believed that administrative quality improvements resolve long-term problems, improve quality and efficiency, and increase morale.

Others have suggested that it is exactly because of the silos and complex structures in higher education that Lean is beneficial and significant. Lean has the possibility to breakdown silos or to at least work across them, as Lean transformation engages cross-functional teams in decision-making and change work (Comm & Mathaisel, 2005; Mullen, 1993). Mullen (1993) aptly described

this work style in the higher education setting as “people crossing departmental boundaries to bring a synergy of expertise and experience to the problem-solving table” (p. 102). The synergy of cross-functional work teams leads to the empowerment of people as employees have the opportunity to change their own processes and experience benefits from these improvements (Likins, 1993). Empowerment also comes from Lean’s broader directive to “generate ideas, make decisions, and effect organizational improvement” (Brigham, 1993, p. 42). Lean and higher education share the values of people, knowledge, and continuous improvement, with an understanding of people as the critical resource (Marchese, 1993; Mullen, 1993).

Strong leadership and effective communication are vital for achieving a successful Lean implementation. This critical success factor is not unique to higher education but true across all industries. In the higher education setting, the leadership charge must come from the top—university presidents or chancellors must act to champion the Lean cause and to provide the necessary resources (Comm & Mathaisel, 2005). Higher education also mimics other organizations in requiring top-down and bottom-up strategies. As Lean strategy is implemented, higher education should expect to apply creativity and adaptation in its approach, working from within its own culture and circumstances (Marchese, 1992).

Employee Empowerment

Empowerment grew out of participative management and employee involvement (Spreitzer, Kizilos, & Nason, 1997), leading some critics to argue that empowerment “is nothing more than employee involvement ‘in borrowed

clothes'" (Hill & Huq, 2004, p. 1039). The basic idea underlying empowerment is moving authority and responsibility down to the lowest levels in the organization (Grigg, 2010; Lawler, 1994, 1999; Paul et al., 2000). This means providing employees with the authority, tools, and rewards to take initiative, apply creativity, make decisions, implement change, and cultivate responsibility (Birdi et al., 2008; Bowen & Lawler, 1992; Comm & Mathaisel, 2005). The following sections examine empowerment in more detail, including its definition, employee-level antecedents, and measurement tools used to assess its presence. The claimed effects of Lean on employee empowerment also are discussed.

Definition

The term *empowerment* first appeared in the field of religion in 1966 (Bartunek & Spreitzer, 2006). Since then, it has been used across various disciplines, including social work, psychology, sociology, education, and management. The wide use of the term has led to ambiguity in its actual meaning (Menon, 2001), resulting in "a family of somewhat related meanings" (Thomas & Velthouse, 1990, p. 666). Further complicating matters, the construct of empowerment has changed and shifted over the 40-year period since its initial introduction (Bartunek & Spreitzer, 2006). Bartunek and Spreitzer concluded based on their review of the literature that empowerment refers to three concepts:

1. Sharing real power. This refers to having power, strengthening power for the underrepresented, political participation, gaining control over one's destiny, and connectedness. This definition is typically used in the fields of religion, sociology, and social work.

2. Fostering human welfare. This refers to improving lives of people, increasing self worth, expanding knowledge, increasing dignity and respect, and providing resources. This definition is most typically used in the fields of education, psychology, and social work.

3. Fostering productivity. This refers to participation in decision making, taking responsibility, sense of ownership, enabling others, and working in teams. This definition is most typically used in the fields of management and organization behavior.

Employee-Level Antecedents

Several authors have concluded that empowerment arises from the individual employee's psychological state and perceptions of oneself, one's work, and one's relationship to the work (Menon, 2001; Spreitzer, 1995; Thomas & Velthouse, 1990). These researchers constructed models that focus on the cognitive variables, employee-level antecedents, that give rise to empowerment and its behavioral effects.

Thomas and Velthouse (1990) explained that intrinsic motivation could be viewed as *power*, where power consists of having authority to complete the task, capacity to accomplish the task, and energy to work on the task. Their model outlines four cognitive attributes of motivation: (a) impact, the extent to which an individual can influence or impact a task in terms of accomplishing the purpose of the task; (b) competence, the extent to which an individual has the skills to perform a task; (c) meaning, the value of the task to the individual; and (d) choice, the individual's level of self-determination or ability to make decisions about the task. Each of these components feeds motivation, thus, contributing to

a self-reinforcing cycle. Spreitzer (1995) added that in addition to producing motivation, these elements also give rise to empowerment.

Spreitzer's (1995) model of empowerment is based on Thomas and Velthouse's (1990) work. Her model consists of impact, competence, meaning, and self-determination (versus choice). *Self-determination* refers to the workers' choice in initiating and regulating work processes (Spreitzer, 1995; Spreitzer et al., 1997). Spreitzer posited that empowerment hinges upon the individual's perspectives; that is, workers' perception of their impact is more important to empowerment than their actual impact, their belief in their own competence is more relevant than their actual competence, and so on. Additionally, according to Spreitzer's model, the meaning of the task is evaluated in relation to their own beliefs and values. Spreitzer elaborated that empowerment exists when workers have an active (rather than passive) orientation toward work (Spreitzer, 1996). Thus, empowerment shifts based on employees' perceptions of themselves in relation to their specific work context and environment. It is not a static or global construct. Empowerment directly influences the degree to which employees are active and willing to shape their own work role and processes (Spreitzer, 1995).

In response to these models, Menon (2001) argued that empowerment needs further clarification, as intrinsic motivation is already a well-documented construct on its own. Menon (1995, 1999) argued that at the heart of empowerment is employee-experienced power, which he viewed as occurring in three forms: (a) perceived control, which is the drive to control or influence others; (b) perceived competence, which is belief in one's ability to carry out the task; and (c) goal internalization, which is being energized toward achieving

valued goals. In Menon's (1999) perspective, empowerment results from both intrinsic and extrinsic influences.

Measurement Tools for Empowerment

According to Menon (2001), "the absence of widely available standardized measures of empowerment has precluded the systematic study of the empowerment process and its effect on employees" (p. 174). Spreitzer (1995) and Menon both created and tested empowerment instruments. Spreitzer developed a multidimensional measure of psychological empowerment based on Thomas and Velthouse's (1990) model and validated the measure in a workplace context. The instrument shows evidence for construct validity, internal consistency, and test-retest reliability. Spreitzer recommended using the empowerment scale in other organizational settings, such as nonprofit or government organizations. She also suggested testing the link between TQM and empowerment.

Menon (2001) developed his own measurement of empowerment that assessed employees' perceived control, perceived competence, and goal internalization. He added that Spreitzer's (1995) self-determination and impact scales correspond to his perceived control scale, whereas Spreitzer's competence scale corresponds to his competence scale. He pointed out that his concept of goal internalization was missing from Spreitzer's model and measurement tool.

Lean's Effects on Empowerment

Lean is believed to have a substantial effect on employee empowerment. These claims are generally based on the alignment between the basic

characteristics of Lean initiatives (e.g., encouraging involvement, building capability, supporting decision making) and the core elements of empowerment (i.e., impact, competence, meaning, self-determination or choice, and goal internalization). Carroll (2001) asserted that for continuous improvement to be possible and effective, power must be granted to those doing the work. Therefore, by its very nature, Lean empowers employees, as employees are granted the authority and equipped with the capability to detect and make needed changes.

Empowerment can be further encouraged during Lean initiatives by giving rewards for performance, administering training on group process and problem-solving techniques, and convening quality circles on a regular basis (Lawler, 1986). In particular, quality circles play a key role in enhancing employees' competence because they allow members to develop a broader understanding of the product or service, which translates into improved decision making about needed improvements.

Advocates of Lean also argue that empowerment results from the practices of delegating responsibility to those who do the work, as this action leads to pride, job satisfaction, and better work control (Wilkinson, Godfrey, & Marchington, 1997). Lawler (1986) added that employees want to be associated with high-quality products and services to satisfy their needs for competence and self-esteem. He posited that employee motivation (and, thus, empowerment) also can be enhanced when employees have influence and choice in how they carry out their work activities.

The aspects of Lean described above point to linkages with the elements of empowerment defined in earlier sections. For these reasons, several authors have argued that empowerment is the foundation for TQM and Lean (Brah et al., 2000; Dahlgaard & Dahlgaard-Park, 2006). Ultimately, Lean may empower employees by shifting certain responsibilities away from management, therefore, institutionalizing empowerment.

Despite these arguments, Lewchuk and Robertson (1997) warned that Lean's connection to improved decision making or a better quality of working life was simply a statement of faith and had not been tested. Others suggested that while Lean initiatives have been widely implemented, empowerment of employees has not been well documented and that few quality initiatives have resulted in empowerment (Yates, Lewchuk, & Stewart, 2001). Critics further emphasized that Lean takes back power and control from employees, ultimately undermining empowerment by increasing managerial control and surveillance (Wilkinson et al., 1997; Yates et al., 2001).

As a result, TQM and Lean initiatives might, at best, provide only the illusion of empowerment. For example, while a kaizen event can expand employees' span of responsibility in a limited way, the employees still do not control their own work environment. Further, participation in the kaizen is structured by management and management controls the process (Lewchuk & Robertson, 1997). Randeniya, Baggaley, and Rahim (1995) concluded based on their own work that although empowerment and Lean share some characteristics, such as a need for employee development, strong leadership,

employee dignity, and well-being, empowerment and Lean actually do not share much in common.

Mohrman, Lawler, and Ledford (1996) further explained that TQM and Lean focus more on work process and customer outcomes, whereas employee involvement initiatives emphasize design of work and organization for improved business involvement and employee motivation. Thus, although a strong correlation exists between involvement and Lean, these authors could not conclude that Lean caused involvement or empowerment to increase.

Summary

The review of literature reveals Lean's widespread usage across a diversity of industries. Lean's origin, the Toyota Production System and TQM, were designed with the central purposes of continuous improvement and respect for people. Lean's approach of participative management and employee involvement creates opportunities for employees to work in teams, participate in decision making, and experience a sense of ownership in their work processes. Each of these attributes was highlighted in the empowerment literature as contributors to empowerment. Some Lean literature suggested employee empowerment as a byproduct and outcome of Lean. However, literature to test the hypothesis that Lean impacts employee empowerment was limited and inconclusive. This study intended to research this hypothesis and discover the relationship between Lean and employee empowerment in a higher education institution.

This chapter summarized current literature on Lean, including its origins, founders and history, definitions of Lean, Lean critical success factors suggested

for successful implementation, and unique applications of Lean in higher education. Literature on employee empowerment also was reviewed, including a definition of empowerment, its antecedents, tools for measuring empowerment, and Lean's effect on empowerment. Chapter 3 describes the research design, sample selection, protection of human subjects, instrumentation development, data collection, data analysis procedures, and participant demographics.

Chapter 3

Methods

This study examined the impact of Lean on employee empowerment within a higher education institution. The research questions were:

1. What are higher education employees' attitudes about Lean?
2. What are employees' interpretations of employee empowerment?
3. What are the influences of Lean on empowerment?

This chapter describes the research design, sample selection, protection of human subjects, instrumentation development, data collection, data analysis procedures, and participant demographics.

Research Design

A mixed method design was used for this research. Mixed method research is a blend of quantitative and qualitative research approaches (Johnson & Onwuegbuzie, 2004). This pluralistic approach combines the hypothesis testing and statistical analysis of quantitative research with the exploration and context-nuanced descriptions available through qualitative research. By employing mixed method research, the survey data can point to statistical relationships between concepts tested, while interviews describe themes and provide additional meaning to the numbers. Results from the converging methods are compared and integrated, further testing data received, and conclusions are then drawn and corroborated.

As with any type of research, a mixed method approach introduces risks of researcher bias. Mixed method studies also can be more time consuming and

involve additional complexity to develop, conduct, analyze, and integrate quantitative and qualitative instruments and data.

A mixed method approach was used in this study to allow for both broad and deep insights to be drawn. This allowed the researcher to statistically analyze relationships among the variables using quantitative survey data and gather interpretations and descriptions of the constructs through qualitative interviews. Conducting this study using mixed-methods provided the possibility for richer results and corroborated conclusions.

Sample Selection

This study was conducted at ABC University, where Lean business principles have been introduced over the past few years. All 215 full-time employees (including senior leadership, administrators, and staff) who regularly use computers as part of their primary work duties were invited to participate in the online survey. The sample was comprised both of employees who had participated in the Lean effort at ABC and also those who had never been involved in Lean.

The interview sample for this study consisted of 10 participants. These participants were randomly drawn from the 45 full-time employees (including senior leadership, administrators, and staff) who had participated in a Lean kaizen or functional analysis over the previous 2 years. The selection process began with the researcher creating the list of potential participants, randomly drawing 10 individuals, and inviting these individuals to participate in the study (see Appendix C). Each individual was contacted one time by email to invite

participation. One individual declined and so one more was randomly selected so that a total of 10 interviews were completed.

Protection of Human Subjects

Institutional approval to conduct the proposed research study was obtained through ABC University on November 16, 2010, and through Pepperdine University's Institutional Review Board on December 20, 2010. In addition, the researcher completed the Protecting Human Subject Research Participants course sponsored by the National Institute of Health on October 8, 2009 (see Appendix D).

Participation in the study was voluntary in that employees chose whether or not to participate and had the right to discontinue the survey or interview at any time without risk or penalty. All raw survey and interview data were kept confidential and were stored securely in the researcher’s password-protected computer and in a locked file cabinet. The data will be stored for 3 years, after which time it will be destroyed. An abstract of the study results will be provided to participants upon request.

In lieu of a signed consent form, consent to participate in the survey was obtained through the first page of the online survey, which described the study, the terms of participation, and participant rights (see Appendix E). Participants were asked to click on a box that provided their consent and acknowledgement of conditions. Participants were not able to access the survey unless they clicked the consent box. Participation in the survey was anonymous and voluntary.

Consent to participate in the interview was obtained using an informed consent form sent by email (see Appendix F), which participants were required to

review, sign, and return before the interview. Participation was voluntary. Interviewees were not individually identifiable on the recordings and their participation and responses were kept confidential. The transcription service that was used maintains a privacy policy to protect the confidentiality of the participants. Only aggregate data was reported by the researcher.

Instruments

Two instruments were used in this study: an online survey and a one-on-one interview script. These instruments are described in detail below, after which the primary reference material sourced for the questions is presented.

Survey

The survey (see Appendix G) was designed to gather information about the participants' background and Lean experience along with their perceptions of Lean and level of empowerment. The survey was organized into 11 scales (see Appendix H):

1. Demographics. The first six questions gathered information about the participants' background, including tenure, position in the organization, division, gender, age, and education.

2. Lean experience. The next two questions gathered information about participants' experience with Lean at ABC University and before joining ABC. First, they were asked to record the number of training sessions, functional analysis events, and kaizen events they attended. Lean was defined as a continuous improvement approach that guides teams to review their work processes to find areas that can be improved. An aim of these events is to observe the process or system design from the customer's or recipient's point of

view. Functional analyses were described as intensive team sessions intended to apply Lean principles to review departmental structure and job design. Kaizens were described as intensive team sessions intended to apply Lean principles to review work processes. Participants also were asked if they had experience with Lean prior to working at ABC.

3. Application of Lean. Next, participants were asked to indicate the degree to which Lean had been applied at ABC. Answer choices ranged from “Not Applied” to “Fully Applied.”

4. Quality of organization’s services. Participants then were asked to rate the overall quality of services provided by ABC on a scale from “Poor” to “Excellent.”

5. Perceived organizational alignment with and support for Lean. Seven questions were used to assess participants’ belief that Lean was supported and aligned with the organization. For example, participants were asked to indicate their agreement with “The goals of Lean are consistent with the goals of ABC University.” These items were rated on a seven-point Likert scale from strongly disagree to strongly agree.

6. Personal buy-in and impact of Lean. Seven questions were used to assess participants’ personal commitment and outcomes related to Lean. For example, participants were asked to indicate their agreement with “Participating in Lean is personally energizing to me.” These items were rated on a seven-point Likert scale from strongly disagree to strongly agree.

The remaining five scales evaluated participants' level of empowerment. These items were rated on a seven-point Likert scale from strongly disagree to strongly agree:

7. Meaning. Three items were used to measure the amount of meaning participants' work held for them. For example, participants were asked to indicate their agreement with "My job activities are personally meaningful to me." These items were adapted from Spreitzer's (1995) empowerment measure.

8. Competence. Three items were used to gauge participants' sense of confidence and competence in their work. For example, participants were asked to indicate their agreement with "I am self-assured about my capabilities to perform my work activities." These items were adapted from Spreitzer's (1995) empowerment measure.

9. Self-determination. Three items assessed participants' degree of autonomy in their work. For example, participants were asked to indicate their agreement with "I have considerable opportunity for independence and freedom in how I do my job." These items were adapted from Spreitzer's (1995) empowerment measure.

10. Impact. Three items assessed participants' sense of having control over and making an impact through their work. For example, participants were asked to indicate their agreement with "I have a great deal of control over what happens in my department." These items were adapted from Spreitzer's (1995) empowerment measure.

11. Goal internalization. Three items appraised participants' degree of being energized or inspired in their work. For example, participants were asked

to indicate their agreement with “I am inspired by what we are trying to achieve as an organization.” These items were adapted from Menon’s (1995) empowerment measure.

The items for scales 3 through 6 above were adapted from three studies. One of these studies had created and validated a TQM institutionalization scale (Sainfort, Mosgaller, Van Rensselaer, & Smith, 1996). This study used the Malcolm Baldrige Award criteria and then inquired into employee perceptions of TQM implementation and impact, which were both shown to be functions of institutionalization. The second of these studies had examined employee adoption and strategic alignment when implementing a Lean program (Gagnon & Michael, 2003). The third study had explored critical factors in organizations that impact employee participation in and experience with TQM activities (Yeh, 2003).

The items from scales 7 through 10 above were drawn from the Psychological Empowerment in the Workplace instrument developed by Spreitzer (1995). This scale of 12 questions measures the extent to which employees believe they are empowered in their jobs (Fields, 2002; Spreitzer, 1995). Spreitzer (1995) defined empowerment as intrinsic motivation through meaning, competence, self-determination, and impact. Previous studies confirmed that all 12 questions loaded on the four corresponding factors (Fields, 2002). Spreitzer gave permission to the researcher to use her validated survey.

Scale 11 was adapted from the goal internalization subscale on the Menon Empowerment Scale (nine-item version), developed by Menon (1995). Menon (2001) defined empowerment as “a cognitive state characterized by a sense of perceived control, competence, and goal internalization” (p. 161) and

described goal internalization as relating to the act of being energized or inspired. The researcher included Menon's goal internalization subscale along with Spreitzer's Psychological Empowerment in the Workplace survey because according to Menon (2001), "there is no strict parallel to the goal internalization dimension" (p. 175) found in the Spreitzer instrument. Including the Menon sub-scale allowed the researcher to test for Lean correlation along various empowerment characteristics. Menon granted the researcher permission to use his validated survey.

The survey closed with two open-ended questions that gathered qualitative data related to participants' reflections on the topic of Lean in the workplace and their feedback about the survey instrument.

Interview

The qualitative portion of this study gathered employee perceptions about Lean and empowerment at ABC University. The one-on-one interview tool was organized into four categories of questions (see Table 1):

1. Application of and involvement with Lean. Three questions asked participants to describe their involvement with Lean and their suggestions for improving its application in the organization. For example, Question 7 asked participants, "What suggestions do you have for improving the application of Lean at ABC University?" These questions were designed based on two studies' contentions that a need exists to improve Lean processes (Bhasin & Burcher, 2006; Emiliani & Stec, 2005) and that leadership support plays a vital role in the success of Lean.

Table 1

Interview Questions

Interview Category	Interview Question
Application of and involvement with Lean	1. What role have you played with Lean at ABC University? 5. Are there ways your supervisor could better support your involvement with Lean? 7. What suggestions do you have for improving the application of Lean at ABC University?
Attitudes toward Lean	2. From your perspective, what is most valuable about Lean at ABC University? 6. What challenges have you experienced with Lean at ABC University? 13. Any other thoughts or comments on Lean or on empowerment?
Perceived impacts of Lean	3. How has Lean influenced your ability to make changes in your department? 4. How has Lean influenced your ability to make changes across departments? 11. How has your involvement with Lean influenced your feeling of empowerment?
Empowerment experiences	8. How would you define empowerment? 9. Tell me about a time when you felt most empowered while working at ABC University? 10. Describe a situation when you felt disempowered while working at ABC University? 12. What would it take for you to feel more empowered at ABC University? 13. Any other thoughts or comments on Lean or on empowerment?

2. Attitudes toward Lean. Three questions solicited participants' opinions about Lean. For example, Question 2 asked participants, "From your perspective, what is most valuable about Lean at ABC University?" These questions were created due to two studies' findings that Lean results in certain organizational core values (Bhasin & Burcher, 2006; Dahlgaard & Dahlgaard-Park, 2006).

3. Perceived impacts of Lean. Three questions examined the impacts the participant has witnessed regarding Lean. For example, Question 3 asked, “How has Lean influenced your ability to make changes in your department?”

These questions were created due to study findings that Lean results in enhanced employee involvement and participation in making improvements (Bhasin & Burcher, 2006; Chowdhury et al., 2007; Hines & Lethbridge, 2008). A focus of this study also was to measure the impact of Lean on empowerment.

4. Empowerment experiences. Five questions gathered data about the participants’ experiences of feeling empowered and disempowered. For example, Question 9 asked participants, “Tell me about a time when you felt most empowered while working at ABC University?” These questions were created to validate Spreitzer’s (1995) and Menon’s (1995) findings about empowerment.

Expert Review

An expert panel reviewed the instruments used in this study to offer the researcher with feedback and revisions. The expert panel consisted of three Lean experts. The first was an adjunct faculty member at the UCO who had more than 20 years of experience in educational assessment and process improvement, served as a board member of the National Consortium for Continuous Improvement, and was the director of the UCO’s Lean University, which certifies Lean facilitators from other higher education institutions. The second expert was a certified Lean facilitator who has a master's in educational psychology with an emphasis in research, measurement, and evaluation; an Ed.D. specializing in program evaluation; 22 years of experience in higher education administration; and was the vice president for enrollment management

and student affairs. The final expert was a certified Lean facilitator who had spent several years conducting Lean in a higher education setting and had served as a program manager working to standardize and improve processes across various regional campuses.

As a result of the expert review, a few survey questions were revised, one question was removed, and the question order was modified. A few interview questions also were revised, several questions were removed, and the question order was modified. The final survey is presented in Appendix G and the final interview script is presented in Appendix I.

Data Collection

The survey was conducted using Survey Monkey, an online tool that administers surveys and houses data. An email was sent to 215 employees that described the purpose of the study, provided a link to the survey, and invited their participation. The survey was open for a 2-week period and reminder emails were sent to the entire sample group 1 week after the initial email and 1 day before the close of the survey. A total of 115 employees responded to the survey, yielding a 53% response rate.

The interviews were conducted in person in an ABC University conference room or by telephone. Each interview lasted 11 to 60 minutes and was audio recorded to facilitate accuracy in data collection. A third party transcription service produced verbatim transcripts of the interviews.

Data Analysis Procedures

Data analysis was performed in three stages: analysis of the survey data, analysis of the interview data, and synthesis of the combined data. These steps are described in detail in the sections below.

Survey Analysis

Frequency statistics were calculated for the demographic variables. Descriptive statistics were calculated for each of the remaining 10 survey scales. To gain further insight, an ANOVA was performed to determine whether the scores for the 10 survey scales varied based on (a) demographic groupings by tenure, position in the organization, division, gender, age, and education; (b) understanding of Lean principles; and (c) exposure to Lean, based on the groupings of no training or experience, training only, and experience (with or without training).

Spearman correlations were performed to determine the nature and significance of the relationships among the measured variables. In particular, the relationships among the following variables were tested: (a) empowerment variables, (b) empowerment based on exposure to Lean, and (c) empowerment based on understanding of and perceived alignment with Lean.

The qualitative responses from the two open-ended questions were reviewed to identify themes. Data were coded according to the identified themes and then reorganized by theme. A second rater reviewed the analysis to confirm the credibility of the analysis. As a result of input from this rater, who holds a master's of science in organization development and Ph.D. in psychology, a few themes were revised and the grouping of themes was modified.

Interview Analysis

The qualitative interview transcripts were reviewed to identify themes for each question and category. The researcher used the following steps to analyze the data:

1. Relevant pieces of data were extracted from the transcripts for each question.

2. The extracted data was reviewed in entirety to gain a sense for the nature of the data.

3. Themes evident in the data were identified for each question.

4. Data for each question were coded according to the identified themes and then reorganized by theme.

5. Themes were revised or recoded, as needed.

6. A second rater reviewed the analysis to confirm the credibility of the analysis. As a result of input from this rater, who holds a masters of science in organization development and a Ph.D. in psychology, a few themes were revised and the grouping of themes was modified.

Synthesis of the Data

Following analysis of the survey data and the interview data, the combined data was examined to determine the findings for each research question. Table 2 reports how the data and data analyses were used to answer the research questions.

Participant Demographics

This section describes the participant demographics. Survey respondent demographics are provided first, followed by interviewee demographics.

Table 2

Data Analysis Plans

Research Question	Data
1. What are higher education employees' attitudes about Lean?	Survey: Application of Lean, perceived organizational alignment with and support for Lean, personal buy-in and impact of Lean Interview: Application of and involvement with Lean, attitudes toward Lean
2. What are employees' interpretations of employee empowerment?	Survey: Correlations among empowerment variables and participant demographics Interview: Empowerment experiences
3. What are the influences of Lean on empowerment?	Survey: ANOVA of empowerment by exposure to Lean, understanding of Lean; correlations among empowerment variables and exposure to Lean, understanding of Lean, perceived alignment with Lean Interview: Perceived impacts of Lean

Survey Demographics

The survey sample consisted of 115 employees (see Table 3). Of these, 54% were female. The sample was diverse in age with more than half between the ages of 18 and 39 years. Close to one-third of the participants were between 30 and 39 years of age. Nearly all participants had bachelors or advanced degrees, with more than half having attained a master's degree. In general, the sample was representative of the total organization population.

In terms of professional demographics, participants' years of service ranged from 0 to 34 years (see Table 4). More than one-third (38.3%) of the participants had worked for the organization between 0 and 4 years and nearly all (83.5%) had worked at the organization for less than 15 years. More than half

the respondents were administrators and 40.9% were staff level. All divisions of the organization were well represented.

Table 3

Personal Demographics for Survey

Demographic	Sample %	Population %	Demographic	Sample %	Population %
Gender			Educational attainment		
Female	54%	52%			
Male	43%	48%	High School or equivalent	1.7%	NA
Unspecified	3%				
Age			Associates	1.7%	NA
18-29 years	20.9%	15%	Bachelors	27.8%	NA
30-39 years	32.2%	28%	Masters	53.9%	NA
40-49 years	15.7%	20%	Doctorate	11.3%	NA
50-59 years	18.3%	21%	Not specified	3.6%	
60 and over	9.6%	15%			
Not specified	3.3%				

N = 115; NA = not available

Table 4

Professional Demographics for Survey

Demographic	Sample %	Population %	Demographic	Sample %	Population %
Organizational Tenure			Division Employed		
0-4 years	38.3%	39%	Enrollment and student affairs	14.8%	12%
5-9 years	28.7%	29%			
10-14 years	16.5%	15%	Finance	14.8%	24%
15-19 years	6.1%	9%	Library and information technology	11.3%	12%
20-24 years	2.6%	4%			
25-29 years	1.7%	2%			
30-34 years	2.6%	2%	President/Provost	7.8%	8%
Not specified	1.8%	NA	School of A	10.4%	7%
Position Level			School of B	7.8%	7%
Administrator	55.7%	47%	School of C	11.3%	7%
Staff	40.9%	53%	Advancement	7.0%	15%
Not specified	3.4%	NA	Vice Provost	10.4%	15%
			Not specified	4.4%	NA

N = 115; NA = not available

A wide array of experience with Lean was reported among participants (see Table 5). Only 9.6% of respondents had experience with Lean before joining the organization. Participants also reported their experience with Lean since joining the organization. Within the organization, Lean experience was defined as Lean training, Lean kaizens or functional analyses (1- to 2-day events), and Lean

kaizens or functional analyses (3- to 5-day events). Nearly half (42.6%) of participants had never attended a Lean training course, whereas 37.4% had attended between one and three training sessions. Half of all participants reported they had never attended any Lean events. Only 28.7% of participants had attended one or more 1- to 2-day Lean events and 34% had attended one or more 3- to 5-day Lean events.

Table 5

Lean Experience

Lean Experience	%
Experience with Lean before joining the organization	
No	79.1%
Yes	9.6%
No answer	11.3%
Experience with Lean at the organization	
Lean Training	
0 sessions completed	42.6%
1 sessions completed	21.7%
2 sessions completed	8.7%
3 sessions completed	7.0%
No answer	20.0%
Lean kaizen or functional analysis (1- to 2-day events)	
0 events	50.4%
1 events	20.9%
2 events	5.2%
3 events	1.7%
4 events	0.0%
5 events	0.9%
No answer	20.9%
Lean kaizen or functional analysis (3- to 5-day events)	
0 events	50.4%
1 events	23.5%
2 events	2.6%
3 events	6.1%
4 events	0.0%
5 events	0.9%
6 events	0.0%
7 events	0.9%
No answer	15.6%

N = 115

Interview Demographics

Ten full-time employees (five male, five female) were randomly selected to participate in an interview (see Table 6). Six participants were at an administrator level and four were staff level. Eight were located at the primary Southern California campus and two were at regional campus locations.

Table 6

Personal Demographics for Interview

Gender	Respondents
Female	5
Male	5
Position Level	
Administrator	6
Staff	4
Campus Location	
Pasadena	8
Regional Campuses	2

N = 10

All 10 employees had previously participated in at least one Lean event (see Table 7). Eight had been involved in at least one kaizen, seven had participated in at least one functional analysis, and five had attended both a kaizen and a functional analysis.

Table 7

Interviewees' Involvement with Lean

Involvement in the Lean process	Respondents
Kaizen participation	8
Functional Analysis participation	7
Both Kaizen & Functional Analysis participation	5
Lean Team Involvement	
Lean Team members	2
Lean participants (not members of the Lean Team)	8

N = 10

Two of the 10 participants were members of ABC University's Lean Team (in addition to their regular full-time duties). These two individuals had completed Lean facilitator training through Lean University at the UCO, which certified them to facilitate and lead Lean. The other eight participants were not members of the Lean Team, which means they had not received the Lean facilitator certification training, but had been participants in Lean events. It is likely that the eight Lean participants had different levels of buy-in and understanding of Lean processes as compared to the two Lean Team members.

Summary

This chapter described the methods used to examine the impact of Lean on employee empowerment within a higher education institution. Included were the research design, sample selection, protection of human subjects, instrumentation development, data collection, data analysis procedures, and participant demographics. Chapter 4 describes the study findings and analysis.

Chapter 4

Results

This study examined the impact of Lean on employee empowerment within a higher education institution. The research questions were:

1. What are higher education employees' attitudes about Lean?
2. What are employees' interpretations of employee empowerment?
3. What are the influences of Lean on empowerment?

This chapter reports the results of the study. Survey results are reported first, followed by interview results and synthesis of the data. Survey results include descriptive statistics and ANOVA results, correlational analyses, and an analysis of the qualitative responses. The interview results section includes themes related to participants' Lean experiences and themes related to participants' experiences of empowerment. The final section synthesizes relevant data regarding attitudes about Lean, interpretations of employee empowerment, and the influence of Lean on empowerment.

Survey Results

The survey collected information about participants' experiences with and attitudes about Lean. The following sections report the descriptive statistics and ANOVA results, correlational analyses, and an analysis of the qualitative responses.

Descriptive Statistics

Descriptive statistics were calculated for the 11 survey scales based on levels of Lean experience, classified as (a) no training or experience, (b) training only, and (c) experience with Lean events with or without training (see Table 8).

A one-way ANOVA also was performed to determine whether the variance in mean scores by group were statistically significant.

Table 8

Descriptive Survey Statistics

	No Training or Experience *N* = 24 Mean (SD)	Training Only *N* = 15 Mean (SD)	Experience (with or without training) *N* = 62 Mean (SD)	ANOVA
Lean Experience (Scale: 1 = low, 5 = high)				
Extent to which Lean has been applied	3.04 (0.91)	2.67 (0.72)	3.03 (0.78)	F(2,96) = 1.34, sig. = .27
Quality of organization's services	3.25 (0.74)	3.21 (0.97)	3.37 (0.71)	F(2,97) = .38, sig. = .68
Lean Experience (Scale: 1 = low, 7 = high)				
Perceived organizational alignment with and support of Lean	4.06 (1.80)	5.10 (0.92)	5.39 (0.96)	F(2,99) = 10.76, sig. = .00**
Personal buy-in and impact of Lean	3.74 (1.61)	4.99 (0.85)	5.32 (1.11)	F(2,99) = 14.94, sig. = .00**
Empowerment (Scale: 1 = low, 7 = high)				
Meaning	5.91 (0.99)	5.44 (1.42)	6.03 (0.98)	F(2,98) = 1.82, sig. = .17
Competence	6.36 (0.50)	6.16 (0.63)	6.20 (0.62)	F(2,98) = .77, sig. = .46
Self-determination	6.02 (0.73)	5.56 (0.98)	6.04 (0.94)	F(2,98) = 1.82, sig. = .17
Impact	5.01 (1.51)	4.93 (1.56)	5.71 (1.15)	F(2,98) = 3.73, sig. = .03*
Goal Internalization	5.96 (1.06)	5.98 (0.94)	5.98 (0.95)	F(2,98) = .00, sig. = 1.00

*significant at .05 level; **significant at .01 level

Perceived organizational alignment with and support of Lean displayed an increasing trend as Lean exposure increased. Participants with no training or experience reported a mean of 4.06 (neutral), participants with training only reported 5.10 (somewhat agree), and participants with Lean experience reported 5.39 (a stronger somewhat agree). These differences were statistically significant: F(2,99) = 10.76, sig. = .00. Personal buy-in and impact of Lean also

exhibited an increasing trend with mean scores ranging from 3.74 (somewhat disagree) for no training or experience, 4.99 (somewhat agree) with training only, and 5.32 (a stronger somewhat agree) with Lean experience. These differences also were statistically significant: F(2,99) = 14.94, sig. = .00.

Participants at all levels of Lean exposure reported mean scores in the somewhat agree range for empowerment—meaning (5.44-6.03), empowerment—self-determination (5.56-6.04), and empowerment—goal internalization (5.96-5.98). Participants at all levels of Lean exposure reported mean scores in the agree range for empowerment—competence (6.16-6.36). The differences in these mean scores were not significant. For empowerment—impact, participants with no training or experience (mean = 5.01) and those with training only (mean = 4.93) exhibited neutral to some agreement that this type of empowerment existed, whereas participants with Lean experience (mean = 5.71) exhibited more agreement that this type of empowerment existed. These differences were statistically significant: F(2,98) = 3.73, sig. = .03.

The survey data also were analyzed by demographic groupings to determine whether the mean scores varied by group. Statistically significant differences in means emerged by level for two variables. First, administrators reported higher perceived organizational alignment with and support of Lean than staff members—5.28 versus 4.66, respectively (see Table 9). The ANOVA results suggested that this difference was statistically significant: F(1,101) = 5.73, sig. = .02. Administrators also reported higher empowerment along the impact dimension than staff—5.04 versus 4.68, respectively. This difference was statistically significant: F(1,100) = 7.54, sig. = .01.

Table 9

Analysis of Variance Results by Position

	Administrator *N* = 60 Mean (SD)	Staff *N* = 43 Mean (SD)	ANOVA
Perceived organizational alignment with and support of Lean	5.28 (0.90)	4.66 (1.69)	F(1,101) = 5.73, sig. = .02*
Empowerment—Impact	5.71 (1.28)	4.98 (1.35)	F(1,100) = 7.54, sig. = .01**

ANOVA = analysis of variance; Scale: 1 = low, 7 = high; *significant at .05 level; **significant at .01 level

Mean scores for the meaning dimension of empowerment were found to be significantly different based on age group (see Table 10). Generally, the meaning dimension was successively higher for each age group. For example, 18 to 29 year olds reported 5.55 (*SD* = 1.34), whereas 60 years and above reported 6.48 (*SD* = 0.46). One exception to this trend was 40 to 49 year olds, who reported a spike at 6.25 (*SD* = 0.83) that was higher than the mean for 50 to 59 year olds (mean = 6.17, *SD* = 0.71). These differences were statistically significant: F(4,97) = 2.81, sig. = .03.

Table 10

Analysis of Variance Results: Empowerment—Meaning

By age	N	Range	Mean (*SD*)	ANOVA
18-29	23	2.33-7.00	5.55 (1.34)	F(4,97) = 2.81, sig. = .03*
30-39	35	3.00-7.00	5.66 (1.12)	
40-49	17	4.00-7.00	6.25 (0.83)	
50-59	16	5.00-7.00	6.17 (0.71)	
60 and above	11	6.00-7.00	6.48 (0.46)	
Scale: 1 = low, 7 = high; *significant at .05 level				

Perceived organizational alignment with and support of Lean as well as personal buy-in and impact of Lean increased as perceived understanding of

Lean principles increased (see Table 11). That is, the greater the mean scores for understanding the principles of Lean, the higher the perceived organizational alignment or personal buy-in. The ANOVA results indicated that these differences were statistically significant: F(4,91) = 6.48, sig. = .00 (perceived organizational alignment with and support of Lean) and F(4,91) = 20.27, sig. = .00 (personal buy-in and impact of Lean).

Table 11

Analysis of Variance Results: Understanding of Lean

	I understand the principles of Lean	*N*	Range	Mean (*SD*)	ANOVA
Perceived organizational alignment with and support of Lean	Strongly Disagree	0			F(4,91) = 6.48, sig. =.00**
	Disagree	0			
	Somewhat Disagree	7	2.57-5.29	4.39 (1.04)	
	Neutral	4	3.29-5.67	4.42 (0.99)	
	Somewhat Agree	30	2.86-6.71	5.05 (0.88)	
	Agree	38	3.29-6.71	5.19 (0.89)	
	Strongly Agree	18	4.86-7.00	5.98 (0.59)	
Personal buy-in and impact of Lean	Strongly Disagree	0			F(4,91) = 20.27, sig. =.00**
	Disagree	0			
	Somewhat Disagree	7	2.57-5.00	3.78 (0.88)	
	Neutral	4	3.00-4.57	3.79 (0.64)	
	Somewhat Agree	30	3.43-5.86	4.82 (0.66)	
	Agree	38	3.29-6.71	5.22 (0.78)	
	Strongly Agree	18	4.71-7.00	6.14 (0.58)	

Scale: 1 = low, 7 = high; **significant at .01 level

Correlational Analysis

Spearman correlations were calculated for the survey variables to determine the nature and significance of the relationships among them. Table 12 displays the correlations among the empowerment variables of meaning, competence, self-determination, impact, and goal internalization. All the variables were significantly and positively correlated to all the other variables ($p < .05$), with the exception of competence. Competence was not significantly correlated to self-determination, impact, or goal internalization. Having a significant positive

relationship means that these variables are associated with each other. However, correlation does not suggest causation or a direction of influence among these variables.

Table 12

Correlations among Empowerment Variables

	Meaning	Competence	Self-Determination	Impact	Goal Internalization
Meaning	1				
Competence	.27 (.01)**	1			
Self-Determination	.29 (.00)**	.07 (.49)	1		
Impact	.22 (.03)*	.09 (.35)	.50 (.00)**	1	
Goal Internalization	.50 (.00)**	.16 (.11)	.31 (.00)**	.26 (.01)**	1

*significant at .05 level; **significant at .01 level

Spearman correlations also were used to determine the relationships among empowerment and Lean training and events (see Table 13). Only two significant relationships were found: impact was positively correlated to participation in 1- to 2-day Lean events (r = .30, p = .01) and participation in 3- to 5-day events (r = .26, p = .01). This suggests that respondents' sense of the impact of their work increases as participation in these events increases (or vice versa). Importantly, correlation does not suggest causation, meaning it is unclear whether (a) participation in these events increases participants' sense of impact, (b) participants' sense of impact inspires them to participate in more in more events, or (c) some other variable causes these variables to increase together.

Spearman correlations were conducted to determine the relationships among empowerment and understanding of and alignment with Lean (see Table 14). Significant relationships were found for competence and impact. Competence was positively correlated to understanding of Lean (r = 0.21, p =

.04) and also with personal alignment with Lean (r = 0.22, p = .03). Impact had a positive correlation with both organizational alignment (r = 0.33, p = .00) and personal alignment (r = .35, p = .00). This suggests that participants' sense of competency in their work increases as they gain more understanding of Lean and more personal alignment with Lean and vice versa.

Table 13

Correlations of Empowerment to Lean Training and Events

	Training	1-2 day	3-5 day
Meaning	-0.01 (.94)	0.18 (.09)	0.09 (.40)
Competence	0.11 (.32)	0.04 (.69)	0.08 (.44)
Self-Determination	-0.13 (.22)	0.19 (.08)	0.09 (.41)
Impact	0.03 (.76)	0.30 (.01)**	0.26 (.01)**
Goal Internalization	0.15 (.16)	0.17 (.11)	0.06 (.57)

*significant at .05 level; **significant at .01 level

Table 14

Correlations of Empowerment to Understanding of and Alignment with Lean

	Understanding	Perceived organizational alignment with and support of Lean	Personal buy-in and impact of Lean
Meaning	0.13 (0.22)	0.08 (0.42)	0.12 (0.22)
Competence	0.21 (0.04)*	0.15 (0.13)	0.22 (0.03)*
Self-Determination	0.08 (0.45)	0.14 (0.15)	0.11 (0.27)
Impact	0.16 (0.13)	0.33 (0.00)**	0.35 (0.00)**
Goal Internalization	0.10 (0.34)	0.11 (0.29)	0.15 (0.13)

*significant at .05 level; **significant at .01 level

Table 15 shows the results of the Spearman correlations, which identified significant positive relationships occurring among the variables of exposure to Lean through training or events, understanding of Lean, and personal and organizational alignment with Lean ($p \leq .01$). Significant positive relationships mean that these variables are associated with each other.

Table 15

Correlations among Lean Training and Events, Understanding of Lean, and Alignment with Lean

	Training	1-2 day	3-5 day	Understanding	Perceived organizational alignment with and support of Lean	Personal buy-in and impact of Lean
Understanding	0.43 (.00)**	0.39 (.00)**	0.40 (.00)**	1		
Perceived organizational alignment with and support of Lean	0.28 (.01)**	0.28 (.01)**	0.30 (.00)**	0.43 (.00)**	1	
Personal buy-in and impact of Lean	0.42 (.00)**	0.34 (.00)**	0.38 (.00)**	0.67 (.00)**	0.84 (.00)**	1

*significant at .05 level; **significant at .01 level

Table 16 presents a summary of the significant relationships among the variables. All the empowerment variables were significantly related to each other, with the exception of competence, which was significantly related only to meaning, at the .01 level. Only competence and impact were significantly related to Lean exposure and alignment. All the Lean exposure and alignment variables were significantly related to each other at the .01 level.

Table 16

Summary of Significant Relationships

	Significance at the .01 level	Significance at the.05 level
Empowerment Variable		
Meaning	Competence Self-determination Goal internalization	Impact
Competence	Meaning	Lean understanding Personal buy-in and impact of Lean
Self-determination	Meaning Impact Goal internalization	
Impact	Self-determination Goal internalization 1- to 2-day event 3- to 5-day event Perceived organizational alignment with and support of Lean Personal buy-in and impact of Lean	Meaning
Goal internalization	Meaning Self-determination Impact	
Lean Exposure or Alignment Variable		
Understanding	Training 1- to 2-day event 3- to 5-day event Perceived organizational alignment with and support of Lean Personal buy-in and impact of Lean	
Perceived organizational alignment with and support of Lean	Training 1- to 2-day event 3- to 5-day event Lean understanding Personal buy-in and impact of Lean	
Personal buy-in and impact of Lean	Training 1- to 2-day event 3- to 5-day event Lean understanding Perceived organizational alignment with and support of Lean	

Qualitative Data

Fifty out of 115 participants also provided qualitative responses on two open-ended questions on the survey (see Table 17). Regarding organizational alignment with and support of Lean, 10 respondents voiced that Lean is critical for the organization. Sample comments were: “I think Lean is a very worthwhile endeavor” and “I do believe that the Lean program at ABC is positive and needed to achieve goals for ABC’s future.”

Table 17

Survey Responses about Organizational Alignment with and Support of Lean

Theme	Respondents
Lean is critical for the organization	10
We should focus on our mission, not solely on efficiency	2

N = 50

Participants commented on Lean outcomes (see Table 18). Ten participants indicated that Lean is an aid to efficiency. Sample comments were: “I love the Lean idea, and when full-blown week-long kaizens have been done, I have seen significant change” and “I appreciate how it is helping us improve certain administrative processes.”

Another six participants suggested that Lean delivers a poor return on investment. Participants commented,

> I think part of the problem with Lean is that it slows the process of getting things done sometimes. I feel that too many people are involved and too much time.
>
> I find Kaizens that run a week and take people out of critical roles to be not very Lean at all. I understand it is working toward a Lean conclusion but the process is wrong and sends the wrong message.

Table 18

Survey Responses about Comments on Lean Outcomes

Theme	Respondents
Lean aids efficiency	10
Lean delivers a poor return on investment	6
Lean is not enough to achieve results	2

N = 50

Feedback was provided on the implementation of Lean (see Table 19). Six participants offered that Lean is still in its infancy or not yet applied in their area. For example, one of these six participants commented,

> I believe the university is just beginning to build momentum with regard to Lean and its principles. We are currently in a very critical time in the history of Lean, which I think will determine whether it is accepted or rejected by the culture.

Three respondents suggested that senior leadership should implement Lean principles and become more involved.

Table 19

Survey Responses about Comments on the Implementation of Lean

Theme	Respondents
Lean is still in its infancy or not yet applied in my area	6
Senior leadership should implement Lean principles	3

N = 50

Participants commented on their exposure to Lean (see Table 20). Nine participants cited a lack of communication or exposure to Lean. One shared,

> More communication between the Lean Team and their projects would be great. Especially for the feeling towards Lean projects that may be getting blamed for slowing things down when the fault could be something else. The more we heard about successful projects on campus, the more excitement there would be.

Two other themes were identified. Three people stated they were already utilizing Lean principles prior to Lean's introduction to the organization. Three people also voiced a fear of Lean due to connotations of job loss.

Table 20

Survey Responses about Exposure to Lean

Theme	Respondents
Lack of communication or exposure to Lean	9
Was already utilizing Lean principles	3
People fear Lean (connotations of job loss)	3

N = 50

Qualitative Data Summary

Several themes emerged in the qualitative survey (see Table 21). Of 50 respondents, 10 stated that Lean is critical for the organization, suggesting organizational alignment with and support of Lean. Ten participants commented that Lean aids efficiency. Lack of communication or exposure to Lean was cited by nine respondents, expressing an interest in receiving more information about Lean projects and an opportunity to participate. Six participants posited that Lean is still in its infancy, has not yet been fully applied in the organization, and is just building momentum. Finally, six respondents stated that Lean delivers a poor return on investment and emphasized that the process consumes too much time.

Table 21

Survey: Qualitative Data Summary

Dominant Theme	Respondents
Lean is critical for the organization	10
Lean aids efficiency	10
Lack of communication or exposure to Lean	9
Lean is still in its infancy	6
Lean delivers a poor return on investment	6

N = 50

Interview Results

The following sections report findings related to participants' application of and involvement with Lean, attitudes toward Lean, perceived impacts of Lean, and empowerment experiences.

Application of and Involvement with Lean

Participants provided suggestions on how Lean could be improved in the organization (see Table 22). Six suggestions were identified. Four participants emphasized that Lean needs to be embedded in the culture and given more visibility. Sample comments were: "I would hope that [Lean] would continue on as truly part of our culture here" and "[Lean is still] a little bit hidden. [There's a need for] just getting out the word as to what Lean is."

Three participants suggested that communication about Lean should be improved, particularly regarding Lean opportunities and the changes that have resulted from Lean projects. Three participants also described the need to improve follow up. One of the three elaborated, "I mean one of the big principles is continuous improvement, so unless we're following up, we're not continually improving."

Table 22

Suggestions for Improving Lean

Suggestion	Respondents
Embed in culture and achieve more visibility	4
Improve communication	3
Follow up on processes	3
Leadership support and involvement in Lean process	2
Expand training and opportunities to participate in Lean	2
Stay true to applying Lean principles	2

N = 10

Participants were given an opportunity to identify any additional support they needed related to Lean processes. Five participants responded they felt fully supported by their supervisors and that no additional support was needed and three participants desired more tools and training (see Table 23). One of the five who felt fully supported commented,

> [My supervisor] has been very, very supportive right from the very beginning. When I first came to him with the idea of joining the Lean Team, he was extremely supportive, saw the value in it right away and just fully supports all of my activities that I do for Lean and supports it in our department.

Table 23

Desired Support for Involvement with Lean

Type of Support	Respondents
No additional support needed	5
Need more tools and training	3
Supervisors need more experience and knowledge of Lean	2

N = 10

Attitudes toward Lean

Participants provided general feedback about their Lean experience (see Table 24). Four participants commented that the Lean process was enjoyable. One of the four participants explained,

> I think [Lean kaizens] are great; I've enjoyed the process. Like I said, I think it's interesting. . . . I have enjoyed the opportunity to do it, I mean I would do it all over again or both of them, the 2 weeks that I was part of."

Table 24

General Feedback on Lean

Feedback	Respondents
Lean was enjoyable	4
Need improved access to Lean training and opportunities	2

N = 10

Participants described the most valuable aspects of Lean (see Table 25). Eight valuable Lean attributes were identified. While most attributes were cited by only two participants, a theme cited by five participants was that Lean enhances cross-departmental understanding and collaboration. A participant shared,

> I think [Lean] helps understanding and relationship building across different departments. And it helps us see things from different perspectives that we may not be aware of. And, I think, for me that was probably one of the most valuable things to come out of it with some of the relational aspects, because then it does help us work together better moving forward.

Four participants stated that Lean helps identify redundancies and increase efficiencies. One of these four described Lean's value in this way: "I think [Lean] is trying to streamline things that we might do double of or triple of—that multiple places are doing—so, trying to just have one place do it."

Table 25

Most Valuable Aspect of Lean

Most Valuable Aspect	Respondents
Enhances cross-departmental understanding and collaboration	5
Helps identify redundancies and increase efficiencies	4
Improves business processes	2
Employees are empowered	2
Creating space to make change	2
Allows for the safe sharing of perspectives	2
Increases buy-in	2

N = 10

Participants commented on challenges they have experienced through Lean (see Table 26). Four participants cited lack of follow-up after a Lean event as one of their challenges. A participant explained,

> I'd probably also enlist follow-up on that, the idea that Lean needs to be an incremental process. We don't tend to come back and evaluate the effectiveness of our efforts and then further refine, which, definitely, ideally that would be the case.

Three participants stated that when Lean was introduced, they perceived that Lean was connected with job loss, but that this fear reduced after participating in Lean. Another challenge (identified by three participants) is lack of communication, specifically around what kaizens and functional analyses are in process and which ones have been completed. In particular, participants wanted to know what changes had occurred as they relate to their work responsibilities.

Table 26

Challenges Experienced with Lean

Challenge	Respondents
Lack of follow-up	4
Lean is perceived to be connected to job loss	3
Lack of communication; not knowing recent changes	3
Non-supportive supervisor and lack of leadership clarity	2
Implementing change is slow	2
Processes are oversimplified in order to implement Lean	2

N = 10

Perceived Impacts of Lean

Participants were asked if Lean influenced their ability to make changes to their own department (see Table 27). Participants identified five positive impacts. Five participants explained that Lean provided them with the ability to improve efficiency and effectiveness within their departments. One of these five participants stated,

> It's made such a difference. When I first did the kaizen that I was a part of, before I even went through the training or was part of the team, I took the things that I learned in that and I could actually bring them back to my office. I changed ways I did processes in my own setting, as well as it gave me an opportunity to look at things we do in our office and make suggestions.

Three participants noted they did not have enough experience with Lean to be able to use it to make changes in their own departments.

Table 27

Influence of Lean on Ability to Make Changes in Department

Influence	Respondents
Positive influence	
Ability to improve efficiency and effectiveness	5
Apply systematic changes	2
Proactive customer focus	2
Ability to rearrange job duties and departmental structure	2
Provides common direction and tools for change	2
No influence or uncertain of influence	
Not enough experience with Lean to comment	3
Not sure it has made a difference	2

N = 10

Participants shared how Lean influenced their ability to make changes across departments (see Table 28). Four participants described Lean as an effective tool to share knowledge across departments. One of these four participants stated,

> I do think that Lean is going to and has, at least most recently, provided an avenue to [share knowledge]. I think, again, giving us a common tool, since it's been something that has been, at least we've been trying to push it out across campus. It's given us a common language to talk about changes and improvements, and it's also just given us a reason to look at things. I would say that's the one area that we have improved on most at ABC University is the across-departmental changes.

Additionally, four participants stated that Lean enhanced cross-departmental collaboration. A participant shared, "As part of the team, I've been able to work with other departments that I normally wouldn't spend a whole lot of time interacting with."

A third theme (mentioned by three participants) was that Lean improves quality and consistency across departments. Participants provided examples of how Lean allowed them to improve the quality of reports, simplify cross-departmental processes, streamline communication, and create better programs for students.

Table 28

Influence of Lean to Make Changes across Departments

Influence	Respondents
Tool to share knowledge across departments	4
Cross-departmental collaboration	4
Improves quality and consistency across departments	3
Builds relationships and appreciation for others' responsibilities	2

N = 10

Central to this study, participants described how Lean influences feelings of empowerment (see Table 29). Three themes emerged to describe how Lean has a positive influence. Seven participants stated that Lean gave them the ability to participate and make decisions. Participants elaborated, "We all have the ability to participate in [Lean] and to own that decision" and "I felt like I was part of making positive change."

Table 29

Influence of Lean on Feelings of Empowerment

Influence of Lean	Respondents
Positive influence	
Ability to participate and make changes	7
Bring people together to share perspectives and increase understanding	6
Break down barriers and build trust	2
No influence	
Lean has no impact on empowerment	2

N = 10

Six participants emphasized that Lean brought people together to share perspectives and increase understanding. One of these six commented, “An employee that feels empowered, that feels like their input is important, is going to accomplish so much more because they have a bigger view of what’s going on.”

Empowerment Experiences

Interview participants provided four definitions of empowerment (see Table 30). Six participants described empowerment as the ability to make decisions and implement changes. One of these six described,

> I think when you empower an employee, they have the ability to make the changes they need to make in their environment in order to work to the best of their ability, in order to exercise their strengths in order to downplay their weaknesses, maximize morale.

Equipping employees properly to do their work and providing freedom were each cited four times by participants as definitions to empowerment. Participants spoke about wanting people “to be equipped, confident, to have the authority” and also about “giving people the freedom and the tools to accomplish whatever task is at hand.” Finally, three participants defined empowerment as receiving support—often in reference to support for making changes, receiving the appropriate tools, and maintaining freedom.

Table 30

Definitions of Empowerment

Definition	Respondents
Ability to make decisions and implement change	6
Equipped to do job	4
Freedom	4
Receiving support	3

N = 10

Participants shared their experiences of times when they felt empowered (see Table 31). Nine of the 10 participants cited the authority to implement and have responsibility for a process or program as the source of their experience of empowerment. Participants described,

> They told me what my job was and gave me all the tools I needed to get it done and then let me run with it. And if I ran into areas where I needed help, I got the help I needed. So that was a fun time, and I felt very empowered during that time.
>
> My boss was like, you're in charge of this. Set it up, research it, figure out what you need to do. So instead of kind of micro-managing the process, I was given free range to do whatever I wanted to make it work, because I was the one responsible for it. And my boss was always there if I had questions about it, but he let me build this entire process all by myself.

Four participants cited the experience of participating in a safe and supportive environment where ideas could be shared and valued. A participant shared, "[Empowerment occurred for me when] there was a commitment to listen to everybody around the table."

Table 31

Experiences of Feeling Empowered

Experience	Respondents
Authority to implement and own a process or program	9
Safe and supportive environment to share ideas	4
Accomplishing a task or project	2

N = 10

Participants were asked to speak about a time when they felt disempowered (see Table 32). Five participants stated they felt disempowered when their ideas or suggestions were not valued or supported. Participants shared their stories:

> It was never any serious opposition to it, but rather the things that needed to happen just fizzled and died rather than actually get any kinda momentum behind it.
>
> So you go from a year and a half of on-and-off effort to back to square one, and you hear about it incidentally, and you think everyone's on the same page and suddenly they're not. That, yeah, I think that's pretty textbook dis-empowering. It's, you know, the kind of thing that makes you just want to throw up your hands and, you know, give up on the process.

Three participants shared examples of disempowerment that came from pressure to accomplish a task or project without appropriate support. One of these three stated, "Where it's like a high expectation that I'm supposed to get this done but I'm not feeling the support to help me do that."

Three participants expressed that disempowerment resulted from required compliance to policies and systems that obstruct their ability to serve the customer. A participant expressed, "I feel disempowered when it's very hard to make a change . . . and the systems seem to be ingrained and it may not make sense particularly for the student."

Table 32

Experiences of Feeling Disempowered

Experience	Respondents
Ideas or suggestions not valued or supported	5
Pressure to accomplish a task or project without support	3
Compliance with policies and systems obstruct ability to serve the customer	3
Micromanaged/lack of trust	2

N = 10

While there was no majority point of view shared by participants, interviewees provided suggestions for improving empowerment (see Table 33). Four participants proposed increased leadership support and understanding as a method to improve empowerment. One of these four participants elaborated,

“Someone respecting me, trusting me, really glad that I do the work that I do. That to me is empowering. . . . Coming alongside as opposed to constantly being over me.”

Modifying job duties and responsibilities was another suggestion offered to improve empowerment (cited by three participants). Participants explained their suggestions:

> Removing some things from my plate of responsibilities and letting me focus more deeply on what remains.
>
> [I would] like to be able to work with people at higher-level leadership in getting stuff done, and being a part of that process.

Table 33

Suggestions for Improving Empowerment

Suggestion	Respondents
Leadership support and understanding	4
Modify job duties and responsibilities	3

N = 10

Interview Summary

Table 34 shows the dominant themes that emerged from the interview data. Out of 10 participants, nine reported that they experienced empowerment when they had the authority to implement and take responsibility for a process or program. When describing Lean’s influence on empowerment, seven interviewees articulated the ability to participate and make changes and six described bringing people together to share perspectives and increase understanding. Empowerment was defined as having the ability to make decisions and implement change by six interviewees. Regarding their participation with Lean, five respondents felt fully supported by their supervisors. There were five participants identifying each of the following characteristics of

Lean: (a) Lean enhances cross-departmental understanding and collaboration, and (b) Lean creates the ability to improve efficiency and effectiveness within departments. Finally, five interviewees described an experience of disempowerment when their ideas or suggestions were not valued or supported.

Table 34

Interview: Qualitative Data Summary

Dominant Theme	Respondents
Empowerment experienced as authority to implement and own a process or program	9
Lean influence on empowerment: Ability to participate and make changes	7
Lean influence on empowerment: Bring people together to share perspectives and increase understanding	6
Empowerment defined as ability to make decisions and implement change	6
No additional support needed for Lean work	5
Lean enhances cross-departmental understanding and collaboration	5
Lean creates ability to improve efficiency and effectiveness in departments	5
Disempowerment experienced when ideas or suggestions are not valued or supported	5

N = 10

Synthesis of Survey and Interview Data

The combined quantitative and qualitative data were examined to consider what findings were produced related to each research question. The following sections report the combined findings for attitudes about Lean, interpretations of employee empowerment, and influence of Lean on empowerment.

Attitudes about Lean

The first research question asked: What are higher education employees' attitudes about Lean? The quantitative and qualitative research data suggest that participants are supportive of Lean business practices at ABC University. Although Lean is still in the first few years of its rollout and has not yet been

applied to all areas of the organization, participants reported that ABC needed Lean and believed it would be a better organization as a result of implementing this strategic initiative.

Survey participants on average agreed that the goals of Lean are consistent with the organization's goals (mean = 5.65). Interviewees reported that the most valuable contributions of Lean are cross-departmental collaboration, shared knowledge and understanding, and increased efficiencies. Participants expressed the desire for more exposure to Lean, which would provide improved communication about Lean, greater visibility, additional tools and training, increased support from supervisors, and enhanced follow-up.

It appears that increased exposure to Lean is associated with enhanced perceptions of organizational alignment with Lean and personal buy-in and impact of Lean. Those with actual Lean experience exhibited higher scores for these attitudes than did those with only Lean training. In turn, those who had completed Lean training had higher scores for perceptions of organizational alignment with Lean and personal buy-in and impact of Lean than did those with no Lean training or experience. The correlational analysis revealed significant positive relationships between Lean exposure and these attitudes

Additional analysis indicates that administrators displayed stronger connections (mean = 5.28) than staff-level employees (mean = 4.66) to perceived organizational alignment with and support of Lean. No significant relationship was connected to personal buy-in and impact of Lean.

Interpretations of Employee Empowerment

The second research question asked: What are employees' interpretations of employee empowerment? Research participants provided descriptions and examples of employee empowerment through the survey and interview process. The qualitative research data suggested that employees feel most empowered when they have the ability to make decisions and implement change. Having the authority and responsibility to own a process or program was another common experience of empowerment. Other related factors include having the right tools and being equipped to do the job, leadership support, and freedom to get the job done.

In contrast to their experiences of empowerment, participants expressed loss of empowerment when their ideas or suggestions were not valued, when they received pressure to accomplish a task without support, or when they experienced constraints such as policies, systems, micromanagement and distrust, or lack of tools or training.

The quantitative data were based on the Empowerment at Work survey, representing five scales that were used to measure empowerment: meaning, competence, self-determination, impact, and goal internalization. Participants generally agreed they felt empowered across all variables. Correlational analysis of these scales found significant positive relationships between each of these scales with the exception of competence. Competence correlated with meaning but not with the other three scales.

Position level displayed a statistically significant difference between administrators (mean = 5.71) and staff (mean = 4.98) on the impact scale.

Administrators rated a higher score on average than staff respondents. Another demographic trait, age, exhibited a positive relationship with the meaning scale. As age increased, the meaning score increased.

Influences of Lean on Empowerment

The third research question asked: What are the influences of Lean on empowerment? The quantitative and qualitative research data suggest that participation in Lean has a positive influence on employee empowerment. In general, the participants' empowerment level was consistent no matter the exposure to Lean, with the exception of the impact dimension. Those with Lean experience had a significantly higher sense of impact than those with training only and those with no exposure to Lean. The connection between Lean and empowerment was further supported through interview data, which suggests that Lean positively affected employee empowerment, in terms of giving employees the ability to participate and make changes to their work and processes and bringing people together to share perspectives and increase understanding.

Positive relationships were found among the impact dimension and (a) Lean experience, (b) perceptions of organizational alignment, and (c) perceptions of personal buy-in and impact. The competence dimension was significantly and positively related to (a) understanding of Lean principles and (b) perceptions of personal buy-in and impact. No other correlations existed between empowerment and other aspects of Lean training or experience.

Summary

In conclusion, this chapter reported the results of the study. Survey results were reported first, including descriptive statistics, correlational analyses, and

qualitative responses. The second section reported the interview results, including themes related to participants' application of Lean, attitudes toward Lean, perceived impacts of Lean, and empowerment experiences. The last section synthesized the qualitative and quantitative data related to each research question. The next and final chapter provides a summary of findings and discusses conclusions drawn from the research, limitations, suggestions for further research, implications for organization development practitioners, and significance of the study.

Chapter 5

Conclusions

This study examined the impact of Lean on employee empowerment within a higher education institution. The research questions were:

1. What are higher education employees' attitudes about Lean?
2. What are employees' interpretations of employee empowerment?
3. What are the influences of Lean on empowerment?

This chapter summarizes the findings and draws conclusions from the research. Study limitations, suggestions for further research, and implications for organization development practitioners, and the significance of the study also are explored.

Summary of Findings and Conclusions

A summary of research findings and conclusions drawn are described below. A summary and set of conclusions are provided for each research question.

Attitudes about Lean in Higher Education

Three conclusions were drawn regarding employee attitudes about lean in higher education:

1. Lean serves a legitimate role. Higher education settings have been described as having complicated and complex organizational structures steeped in silos, separation, and hierarchy, and resistant to change (Comm & Mathaisel, 2005; Hines & Lethbridge, 2008; Marchese, 1993; Roffe, 1998). Although Koch and Fisher (1998) described Lean as "marginally useful" in higher education, the present study concluded that Lean has found a legitimate role and supportive

environment in higher education based on participants' attitudes toward Lean. While Lean originated in manufacturing and has already proven useful in those settings, this study suggests that it is also useful in higher education.

2. Lean is beneficial. This study exposed a variety of benefits that participants attributed to Lean in higher education, including cross-departmental collaboration, shared knowledge, and increased efficiencies. Because these benefits were reported to improve communication and work processes across departments, the introduction of Lean into the higher education environment appears to minimize organizational gaps and silos.

Marchese's (1993) claim that Lean is beneficial and relevant in higher education, encourages cross-unit collaboration, assists in the resolution of long-term problems, and improves quality and efficiency was supported by the qualitative results in the present study. The attitudes about Lean reflected in this study also are consistent with research by Comm and Mathaisel (2005), which concluded that Lean can be successfully applied to higher education, with the opportunity to increase efficiencies and improve administrative work across the assortment of small departments that make up these academic institutions.

3. Lean alignment is enhanced through participation. This study supported the findings of Marchese (1993) and Mullen (1993) that the goals and values of Lean are perceived to be in alignment with the goals and values of higher education (mean = 5.65). Participation in Lean was shown to enhance perceptions of organizational alignment with Lean and personal buy-in and impact of Lean. Lean training also influenced these attitudes, although to a lesser extent than direct Lean experience. These findings build on Gagnon and

Michael's (2003) research that employee alignment is critical to the implementation of a strategic initiative. While Gagnon and Michael (2003) found that providing communication and knowledge about Lean can lead to enhanced employee alignment with Lean, this research in a higher education setting indicates that participating in Lean yields even greater influence on organizational and personal alignment with Lean than simply providing education and training.

Interpretations of Employee Empowerment in Higher Education

Three conclusions were drawn regarding employees' interpretations of empowerment in higher education:

1. Authority, responsibility, and decision making. This study concluded that employee empowerment in a higher education setting was most commonly described and experienced as the authority and responsibility to own a process or program and as the ability to make decisions and implement change. Having the right tools and being equipped to do the job, receiving leadership support, and obtaining freedom to get the job done also were highlighted by participants. These interpretations of empowerment are consistent with the fostering productivity category described by Bartunek and Spreitzer (2006) in their literature review study of the construct of empowerment over a 40-year period.

2. Demographic characteristics. The demographic characteristics of position level and age displayed positive relationships with empowerment dimensions. This study suggested that administrators perceive having greater influence on their work (mean = 5.71) than staff-level employees do (mean = 4.98), evidenced by administrators' higher scores for impact. This may be

explained by the increased authority, responsibility, and decision-making duties administrators have. Notably, these factors were associated with increased empowerment in the present study and in the literature. This study also found that age has a positive relationship with the meaning dimension from the empowerment construct. This finding could result from (a) employees creating or discovering more meaning in their present work as they age, (b) employees selecting jobs that fulfill them and that they see as having meaning as they increase in age, or (c) a third variable could be influencing both meaning and age.

3. Higher education employees experience empowerment. The empowerment survey used in this study included Spreitzer's (1995) empowerment at work instrument (including the dimensions of impact, competence, meaning, and self-determination) and Menon's (2001) Empowerment Scale (the goal internalization dimension). The results demonstrated that the survey's five dimensions expressed positive correlations with one another, with the exception of competence, which only had a positive relationship with meaning. While participants generally agreed they felt empowered across all dimensions, competence (mean = 6.24) displayed the strongest empowerment rating, compared to the other four dimensions of meaning (mean = 5.90), self-determination (mean = 5.96), impact (mean = 5.40), and goal internalization (mean = 5.97). These findings suggest that, overall, higher education employees experience empowerment in their work at ABC. The variance in correlation and in rating for the competence dimension also may

reflect a difference in definition or relationship for competence in higher education settings.

Influence of Lean on Employee Empowerment in Higher Education

Finally, three conclusions were drawn regarding the influence of lean on employee empowerment in higher education:

1. Lean influences empowerment. This study concludes that Lean, conducted in higher education, has a positive influence on employee empowerment along the impact dimension. The positive relationship expressed between Lean and empowerment in both quantitative and qualitative analysis counters previous studies and claims that Lean has little or a negative relationship with empowerment (Lewchuk & Robertson, 1997; Yates et al., 2001). The present research further contrasts with Lewchuk and Robertson's statement that those who believe Lean will lead to more empowerment are "making statements of faith rather than tested propositions" (p. 42). This study tested the relationships between Lean implementation and empowerment in a higher education setting and concluded that employee empowerment (impact dimension) is a benefit of Lean.

2. Lean is designed for empowerment. Lean's structure and design intends for employees to have the responsibility to contribute ideas, to make decisions, to look for improvements, and to maintain ownership of their work (Dahlgaard & Dahlgaard-Park, 2006; Lawler, 1994), attributes that participants of the present study provided as interpretations of empowerment. This study supports the claim that for empowerment to occur, employees also need support, appropriate skills and tools, and cross-functional teams to engage in decision-

making changes. All of these are typical aspects of the Lean process (Comm & Mathaisel, 2005).

Bartunek and Spreitzer (2006) found that the management field usually describes empowerment as fostering productivity through initiatives such as employee participation in decision-making, increased task responsibility, work in teams, and improved sense of ownership. Specifically, the empowerment dimension of impact was defined by Spreitzer (1995) as the individual's perception of the influence an individual has on strategic or administrative work outcomes. This study provides evidence for the supposition that Lean involves employees and invites them to have direct influence and impact on their work outcomes. Thus, those who participated in Lean reported greater perceptions of impact and influence in their work.

3. Empowerment is multidimensional. This study reflects Spreitzer et al.'s (1997) assertion that empowerment cannot be defined unidimensionally and that no single dimension will relate to all work approaches. This research also shows that not all dimensions of empowerment will necessarily be found to relate to a particular work approach or strategic initiative. This study concluded that only the impact dimension had a positive relationship with Lean activity. Competence, meaning, self-determination, and goal internalization were not significantly related to Lean. Therefore, additional work approaches and strategic initiatives would need to be tested to find which ones may influence the other empowerment dimensions.

Limitations

Three key limitations may have influenced this study: single employer setting, researcher bias, and survey design. First, this study was conducted in only one organization. It is difficult to know the level of generalizability because this particular institution is fairly unique in higher education as a graduate school-only environment. Although only one academic institution was used, employees from its seven campus locations were invited to participate in the study.

Second, as an employee of the academic institution, potential research bias is present. While the researcher was not a member of the selected sample group and abstained from completing the survey and interview questions, it is possible that the researcher's beliefs and assumptions about Lean or empowerment influenced data interpretation. To reduce bias, analysis of quantitative and qualitative data was confirmed by a second rater.

Third, two comments were received in the open-ended section of the online survey about the redundancy of survey questions. The researcher chose to use the empowerment survey questions exactly as they were developed by Spreitzer (1995) and Menon (1995), since each of the instruments had been previously tested and validated. These questions were repetitive in nature as three similar questions were asked regarding each empowerment dimension, for all five dimensions. While these 15 questions may have been experienced as redundant, this should not have affected any other survey responses because the empowerment questions were included as the last set of questions so as not to influence the earlier portion of the survey. Also, the whole survey was intentionally developed to be concise to minimize survey question fatigue.

Another respondent noted the survey was a short, substantive, well-organized survey.

Suggestions for Further Research

Replication of this study in other institutes of higher education would help to test the generalizability and validity of these research results regarding attitudes about Lean in higher education, interpretations of employee empowerment, and linkages between Lean and employee empowerment. Conducting this research in other industries outside of higher education would further assess experiences of and the relationship between Lean and employee empowerment. Additional dimensions, such as alignment or effectiveness, could be included in future studies.

Studies also could examine the costs and benefits of empowerment, specifically: Is the experience of empowerment desirable in all employment contexts? When might empowerment lead to increased stress? Research also could be conducted to explore the relationship between demographics and empowerment, such as position level and age, and more specifically, the connection between age and the meaning dimension of empowerment. Studies also could be performed to examine how the competence dimension is understood in higher education or non-profit settings compared to for-profit organizations.

Finally, future research could explore which attributes of Lean specifically influence the impact dimension of empowerment. Also, since empowerment is multidimensional, studies could identify other strategic initiatives and

interventions that display a positive relationship and potential influence on the remaining dimensions of empowerment.

Implications for Organization Development Practitioners

Organization development practitioners working in higher education may want to consider Lean as a useful tool for involving employees in implementing changes and improvements in their work processes. Since higher education culture tends to be resistant to change, Lean's participatory approach may be one method that can assist an academic institution with promoting cross-departmental collaboration, increased knowledge sharing, and improved efficiencies, as presented in this study.

According to these research findings, organization development practitioners will want to prioritize engaging employees in the practice of Lean rather than simply providing training. Involving employees in Lean was shown to be beneficial for increasing their perceived organizational alignment and personal buy-in with Lean. Firsthand experience with Lean provided employees with a greater sense of empowerment along the impact dimension, enhancing their perception of influence on strategic or administrative work outcomes. Also, attention should be given to the resulting increase in empowerment along the impact dimension.

Finally, it is important for organization development practitioners to note that various tools and interventions may be required to influence the different dimensions of empowerment. As Lean was only found to influence impact, other interventions need to be tested to learn what may enhance competence, meaning, self-determination, and goal internalization.

Significance of the Study

This study followed Spreitzer's (1995) recommendation for further use and testing of her Psychological Empowerment in the Workplace instrument in a nonprofit setting and also her suggestion to examine the link between TQM and empowerment. As Lean and employee empowerment are receiving increased attention in higher education settings, this research examined the implications and explored employees' attitudes about Lean and interpretations of empowerment. Understanding employees' attitudes about Lean will help generate principles and best practices for Lean implementation in higher education. Exploration of employees' views of empowerment will provide understanding of experiences and sources of empowerment. Finally, identifying the relationship between Lean and empowerment will guide higher education administration to select the appropriate strategic initiatives and interventions, and then prepare for related demands and outcomes.

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Appendix A

W. Edwards Deming's 14 Points for Management

W. Edwards Deming's 14 Points for Management

1. Create constancy of purpose for improvement of product and service.
2. Adopt the new philosophy.
3. Cease dependence on mass inspection.
4. End the practice of awarding business on price tag alone.
5. Improve constantly and forever the system of production and service.
6. Institute training on the job.
7. Institute leadership.
8. Drive out fear.
9. Break down barriers between departments.
10. Eliminate slogans, exhortations, and targets for the workforce.
11. Eliminate numerical quotas for the workforce. Eliminate numerical goals for people in management.
12. Remove barriers to pride of workmanship.
13. Encourage education and self-improvement for everyone.
14. Take action to accomplish the transformation.

Note. From *Out of the Crisis*, by W. E. Deming, 2000, Cambridge, MA: MIT Press.

Appendix B

Philip Crosby 14 Steps

Philip Crosby 14 Steps

1. Management commitment
2. Quality improvement team
3. Quality measurement
4. The cost of quality
5. Quality awareness
6. Corrective action
7. Zero defects planning
8. Employee education
9. Zero Defects Day
10. Goal setting
11. Error-cause removal
12. Recognition
13. Quality councils
14. Do it all over again

Note. Quality without Tears: The Art of Hassle-Free Management, by P. B. Crosby, 1995, New York: McGraw-Hill.

Appendix C

Interview Invitation Email

Dear [ABC University Employee],

I am currently a student at Pepperdine University and am in the process of conducting research for my thesis project in partnership with ABC University's Lean Team. In my study I am researching the impact of Lean on employee empowerment in a higher education setting.

I randomly selected your name from ABC University's records of full-time employees who have participated in a Lean event. I would like to invite you to participate in an interview so I can learn about your experience with Lean at ABC University and to hear about your feelings around empowerment at work.

Your participation is strictly voluntary. The interview will be one-on-one with me and will take approximately 45 to 60 minutes. So that I can best capture your input, I would like to record the interview and have it transcribed. Your responses will be kept anonymous and confidential.

If you are interested, send me an email to suggest times that would be most convenient for you between January 4 and January 7, 2011.

If you would rather decline, please email and let me know.

Should you decide to participate in the interview, attached is the consent form. Please read it closely and contact me with any questions you may have. You may deliver the signed consent form to me at the time of the interview. I will also bring a copy of the consent form to the interview.

I appreciate your consideration and hope you decide to sign up for an interview.

Thank you,

Bernadette J. Barber
[contact information]

Appendix D

Protecting Human Research Participants Certificate

Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that **Bernadette Barber** successfully completed the NIH Web-based training course "Protecting Human Research Participants".

Date of completion: 10/08/2009

Certification Number: 311775

Appendix E

Survey Consent Form

Dear ABC University Employee,

As a student in the Master of Science in Organization Development program at Pepperdine University, Graziadio School of Business and Management, I am currently recruiting individuals for my study entitled, “The Impact of Lean on Employee Empowerment.” The professor supervising my work is Dr. Miriam Y. Lacey.

This study is designed to investigate if the application of Lean in a higher education context impacts employee empowerment levels. Lean is a continuous improvement approach that guides teams to review their work processes to find areas that can be improved, especially from the recipients' point of view. ABC University has introduced Lean over the past few years, and during this last year, the Lean Team has been involved with Lean through training, functional analyses, and kaizens. I am inviting you, as a full-time administrator- or staff-level employee at ABC University, to participate in this study.

Please understand your participation in the study is strictly voluntary. The following is a description of what your participation entails, the terms for participating, and a discussion of your rights as a study participant. Please read this information carefully before deciding whether or not you wish to participate.

If you should decide to participate in the study, you will be asked to complete the following online survey regarding your experience with Lean and your level of empowerment. Completion of this survey will take approximately 10 to 15 minutes. Please complete the survey alone in a single setting.

Your responses will be kept anonymous and confidential.

There are no direct benefits to you for participating in the study. This is an opportunity for you to give input about Lean’s influence on employee empowerment at ABC University.

There are no major risks associated with this study.

If you should decide to participate and find you are not interested in completing the survey in its entirety, you have the right to discontinue at any point without being questioned about your decision. You also do not have to answer any of the questions on the survey that you prefer not to answer—simply leave such items blank. Terminating your participation at any time will not put your professional position in jeopardy in any way.

One week after the initial email invitation is sent and again one day before the final survey deadline, a reminder email will be sent to you to complete the survey. Since this email will go out to everyone, I apologize ahead of time for sending you these reminders if you have already completed the survey prior to the deadline.

If the findings of the study are presented to professional audiences or published, no information that identifies you personally will be released. The data will be kept in a secure manner for three (3) years, at which time the data will be destroyed.

If you have any questions regarding the information that I have provided above, please do not hesitate to contact me at the email and phone number provided below. If you have further questions or do not feel I have adequately addressed your concerns, please contact my research supervisor, Dr. Miriam Y. Lacey at [contact information]. If you have questions about your rights as a research participant, contact Dr. Doug Leigh, Chairperson of the Institutional Review Board, Pepperdine University, at [contact information].

You are welcome to a brief summary of the study findings in about one (1) year. If you are interested in receiving the summary, please send me an email under separate cover to [contact information].

Thank you for taking the time to read this information, and I hope you decide to complete the survey.

Sincerely,

Bernadette J. Barber
Student, Master of Science in Organization Development
[contact information]

***1. By checking the box below and by completing the survey online, you are acknowledging that you have read and understand what your study participation entails, and are consenting to participate in the study.**
❒ I have read the informed consent (above) and agree to participate in this study.

Appendix F

Interview Consent Form

Informed Consent for Participation in Research Activities

Participant: _____

Principal Investigator: Bernadette J. Barber

Title of Project: Impact of Lean on Employee Empowerment in Higher Education

1. I _____, agree to participate in the research study being conducted by Bernadette J. Barber, a student in the Master of Science in Organization Development program at Pepperdine University, Graziadio School of Business and Management, under the direction of Dr. Miriam Y. Lacey.

2. The overall purpose of this study is designed to investigate if the application of Lean in a higher education context impacts employee empowerment levels. Lean is a continuous improvement approach that guides teams to review their work processes to find areas that can be improved, especially from the recipients' point of view. ABC University has introduced Lean over the past few years, and during this last year, the Lean Team has been involved with Lean through training, functional analyses, and kaizens. Full-time administrators- and staff-level employees at ABC University are invited to participate in this study.

3. My participation will involve a 45 to 60 minute interview, which will be conducted face-to-face in an ABC University conference room or on the phone. I grant permission for the interview to be tape recorded and transcribed, and to be used only by Bernadette J. Barber for analysis of interview data. I understand my responses will be kept anonymous and confidential. If the findings of the study are presented to professional audiences or published, no information that identifies me personally will be released. The data will be kept in a secure manner for three (3) years, at which time the data will be destroyed.

4. I understand there are no direct benefits to me for participating in the study. This is an opportunity to give input about Lean's influence on employee empowerment at ABC University.

5. I understand there are no major risks associated with this study.

6. I understand that I may choose not to participate in this research.

7. I understand that my participation is voluntary and that I may refuse to participate and/or withdraw my consent and discontinue participation in

the interview at any time without penalty or loss of benefits to which I am otherwise entitled.

8. I understand that I may request a brief summary of the study findings to be delivered in about one (1) year. If I am interested in receiving the summary, I will send an email request to [contact information].

9. I understand that the researcher, Bernadette J. Barber, will take all reasonable measures to protect the confidentiality of my records and my identity will not be revealed in any publication that may result from this project. The confidentiality of my records will be maintained in accordance with applicable state and federal laws.

10. I understand that the investigator is willing to answer any inquiries I may have concerning the research herein described and that I may contact the researcher, Bernadette J. Barber at [contact information]. I understand that I may contact Dr. Miriam Y. Lacey at [contact information] if I have other questions or concerns about this research. If I have questions about my rights as a research participant, I understand that I can contact Dr. Doug Leigh, Chairperson of the Institutional Review Board, Pepperdine University, at [contact information].

11. I understand to my satisfaction the information regarding participation in the research project. All my questions have been answered to my satisfaction. I have received a copy of this informed consent form, which I have read and understand. I hereby consent to participate in the research described above.

_____ _____
Participant Signature Date

_____
Participant Name

I have explained and defined in detail the research procedure in which the subject has consented to participate. Having explained this and answered any questions, I am cosigning this form and accepting this person's consent.

_____ _____
Principal Investigator: Bernadette J. Barber Date

Appendix G

Survey

Lean and Empowerment Survey

Demographic Data

1. **Please select the number of years you have been employed at ABC University.**
   - 0-4
   - 5-9
   - 10-14
   - 15-19
   - 20-24
   - 25-29
   - 30-34
   - 35 and above

2. **What is your position level?**
   - Administrator/Manager
   - Staff

3. **In which Division are you employed at ABC University?**
   - Enrollment and Student Affairs
   - Finance
   - Library and Information Technology
   - President/Provost
   - School of A
   - School of B
   - School of C
   - Advancement
   - Vice Provost

4. **What is your gender?**
   - Female
   - Male

5. **What is your age?**
   - 18-29
   - 30-39
   - 40-49
   - 50-59
   - 60 and above

6. **What is the highest level of education you have completed?**
   - High School (or equivalent)
   - Associates
   - Bachelors

- Masters
- Doctorate

Lean Experience

LEAN is a continuous improvement approach that guides teams to review their work processes to find areas that can be improved, especially from the recipients' point of view.

In a LEAN TRAINING SESSION, Lean principles such as the 8 Wastes, value from the customer's perspective, and conducting 5S reviews are taught.

In a LEAN KAIZEN, Lean principles are applied to review a particular work process.

In a LEAN FUNCTIONAL ANALYSIS, Lean principles are applied to review departmental structure and job design.

1. **In how many Lean events have you participated (or facilitated) at ABC University? See above for definitions.**
   (Please enter a number in each box below. If you have not participated then enter "0" in the appropriate box.)
   - Lean training sessions _____
   - Lean kaizen or functional analysis (1 to 2 day events) _____
   - Lean kaizen or functional analysis (3 to 5 day events) _____

2. **Did you have experience with Lean prior to working at ABC University?**
   - No
   - Yes

3. **Please rate the extent to which you believe Lean has been applied (implemented) at ABC University?**
   - Not Applied
   - Partially Applied
   - Moderately Applied
   - Mostly Applied
   - Fully Applied

4. **Please rate the following: (7 point likert from strongly disagree to strongly agree, plus N/A)**
   - I understand the key principals of Lean.
   - The goals of Lean are consistent with the goals of ABC University.
   - I am convinced we need Lean at ABC University.
   - Lean seems to have increasing momentum at ABC University.
   - I could teach a coworker about Lean.
   - Participating in Lean is personally energizing to me.
   - My supervisor has supported my participation in Lean.

5. **Please rate the following: (7 point likert from strongly disagree to strongly agree, plus N/A)**
   - My thinking has changed as a result of Lean.
   - My supervisor has encouraged implementing recommendations from a Lean event.
   - I sense quite a bit of enthusiasm associated with Lean at ABC University.
   - Senior leadership has communicated the purpose of implementing Lean at ABC University.
   - I look for ways to improve my work processes and systems at ABC University.
   - ABC University will be a better organization as a result of Lean.
   - Overall, I am satisfied that Lean has been implemented at ABC University.

6. **How would you rate the overall quality of services provided by ABC University?**
   - Poor
   - Fair
   - Good
   - Very Good
   - Excellent

Empowerment at Work

1. **Please rate the following: (7 point likert from strongly disagree to strongly agree)**
   - The work I do is very important to me.
   - I am confident about my ability to do my job.
   - I have significant autonomy in determining how I do my job.
   - I am inspired by what we are trying to achieve as an organization.
   - My impact on what happens in my department is large.

2. **Please rate the following: (7 point likert from strongly disagree to strongly agree)**
   - My job activities are personally meaningful to me.
   - I am self-assured about my capabilities to perform my work activities.
   - I can decide on my own how to go about doing my work.
   - I am inspired by the goals of ABC University.
   - I have a great deal of control over what happens in my department.

3. **Please rate the following: (7 point likert from strongly disagree to strongly agree)**
   - The work I do is meaningful to me.
   - I have mastered the skills necessary for my job.
   - I have considerable opportunity for independence and freedom in how I do my job.

- I am enthusiastic about working toward ABC University's objectives.
- I have significant influence over what happens in my department.

Feedback

- Use this space for any comments that you would like to make about Lean at ABC University.
- Use this space for any comments that you would like to make about the survey.

If you would like to go back and change any of your responses, please do so before clicking the "Done" button below. Once you submit the survey you will not be able to go back and change your answers.

Appendix H

Survey Scales

Survey Scales

Scale	Questions
Demographics	• Please select the number of years you have been employed at ABC University. • What is your position level? • In which Division are you employed at ABC University? • Gender • Age • What is the highest level of education you have completed?
Lean experience	• In how many Lean events have you participated (or facilitated) at ABC University? • Did you have experience with Lean prior to working at ABC University?
Application of Lean	• Please rate the extent to which you believe Lean has been applied (or implemented) at ABC University?
Organizational quality	• How would you rate the overall quality of services provided by ABC University?
Perceived organizational alignment with and support for Lean	• The goals of Lean are consistent with the goals of ABC University. • I am convinced we need Lean at ABC University. • Lean seems to have increasing momentum at ABC University. • My supervisor has supported my participation in Lean. • I sense quite a bit of enthusiasm associated with Lean at ABC University. • My supervisor has encouraged implementing recommendations from a Lean event. • Senior leadership has communicated the purpose of implementing Lean at ABC University.
Personal buy-in and impact of Lean	• I understand the key principles of Lean. • I could teach a coworker about Lean. • Participating in Lean is personally energizing to me. • My thinking has changed as a result of Lean. • I look for ways to improve my work processes and systems at ABC University. • ABC University will be a better organization as a result of Lean. • Overall, I am satisfied that Lean has been implemented at ABC University.

Scale	Questions
Empowerment	
Meaning	• The work I do is very important to me. • My job activities are personally meaningful to me. • The work I do is meaningful to me.
Competence	• I am confident about my ability to do my job. • I am self-assured about my capabilities to perform my work activities. • I have mastered the skills necessary for my job
Self-determination	• I have significant autonomy in determining how I do my job. • I can decide on my own how to go about doing my work. • I have considerable opportunity for independence and freedom in how I do my job.
Impact	• My impact on what happens in my department is large. • I have a great deal of control over what happens in my department. • I have significant influence over what happens in my department.
Goal internalization	• I am inspired by what we are trying to achieve as an organization. • I am inspired by the goals of ABC University. • I am enthusiastic about working toward ABC University's objectives.

Appendix I

Interview Script

Opening Comments and Checklist

- Please take a moment to review and sign the consent form, if you are willing to participate.
- As it states in the consent form, this interview will be recorded.
- This is an interview, not a conversation. I will not be commenting along the way.
- Please let me know if you would like me to read a question again.
- Reminder: this is confidential. No raw data will be reported, only data in aggregate.
- Thank you for your willingness to participate in this study.

Interview Questions

1. What role have you played with Lean at ABC University?

2. From your perspective, what is most valuable about Lean at ABC University?

3. How has Lean influenced your ability to make changes in your department?

4. How has Lean influenced your ability to make changes across departments?

5. Are there ways your supervisor could better support your involvement with Lean?

6. What challenges have you experienced with Lean at ABC University?

7. What suggestions do you have for improving the application of Lean at ABC University?

8. How would you define empowerment?

9. Tell me about a time when you felt most empowered while working at ABC University.

10. Describe a situation where you felt disempowered while working at ABC University.

11. How has your involvement with Lean influenced your feeling of empowerment?

12. What would it take for you to feel more empowered at ABC University?

13. Any other comments you would like to make about Lean or empowerment?