A QUANTITATIVE EXAMINATION OF THE RELATIONSHIP BETWEEN PROJECT MANAGEMENT TRAINING AND PROJECT MANAGEMENT SELF-EFFICACY AMONG FACULTY/STAFF IN HIGHER EDUCATION

by

Alan W. Stanfield

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

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Abstract

Project management techniques are common within a number of construction related industries, however, higher education is not a field to which the practices of project management are routinely applied. Although multiple factors could lead to the lack of project management application in higher education, this study focused on faculty/staff self-efficacy and project work experience. The purpose was to determine if self-efficacy and project work experience contribute to the lack of project management techniques applied in higher education. The study was based upon Bandura's theory of self-efficacy and how project work experience may affect faculty/staff venturing into applying project management techniques. The significance of the study will contribute to addressing the gaps in the literature pertaining to why project work in higher education is viewed differently than other industries experiencing similar issues. The study shows the implications of self-efficacy and project work experience along with how organizational change factors in the application of project management techniques. The results of the study provided a positive change in the organizational climate of higher education by demonstrating the value of project management in addressing a variety of processes within a higher education setting. Finally, the biblical application of the research correlated with the evidence of project management techniques utilized in the Old Testament accounts of Nehemiah and the reconstruction of the walls of Jerusalem.

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Dedication

I would like to dedicate this research to the field of project management and to those who have dedicated their careers in higher education. It is with sincere hope that the research will provide for the advancement of project management within higher education.

Acknowledgements

I would like to express my appreciation to God for the ability to conquer my dream of earning a doctoral degree and for the talents that He has provided. I would also thank my family and friends for their continued encouragement and support throughout this process. Thank you to dissertation committee members of Liberty University who have dedicated their lives to help so many like me. Finally, I would not have seen this to completion without the friendship and support of my cohort group.

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Section 1: Foundation of the Study

The practice of project management techniques in engineering, construction, and information technology is quite common. However, higher education often views project management as not having value outside of construction related industries and considers the process to be too rigid for application within high education, therefore, there is a lack of project management integration in high education (Austin, Browne, Haas, Kenyetta, & Zulueta, 2013). The researcher conducted the study to determine if project management self-efficacy contributes to project management level of knowledge and confidence in the ability to apply project management skills. The work of Bandura (1997) and the theory of self-efficacy was used in the research.

Background of the Problem

At the level of competition and speed at which institutes of higher education are forced to operate, there are demands to initiate a number of projects concurrently in order to remain competitive (Burgher & Snyder, 2012a). This presents a problem for many higher education institutions in that there is insufficient time and resources to complete these projects along with a lack of priority determining methods to accomplish the projects (Burgher & Snyder, 2012a). Implementing the concepts of project management could assist in responding to the issues facing higher education by initiating the project, planning the work of the project, controlling the tasks, and providing a system for project closure (Clark, 2008). Considering these issues related to higher education, an opportunity exists to determine if higher education can benefit from the implementation of project management (Austin et al., 2013).

A recent survey of project management indicated that project management techniques could address some of the demands that lead to greater efficiency, reductions in public funding,

and the generation of additional income for universities (Bryde & Leighton, 2009). The use of project management is typically connected with construction, manufacturing, and process reengineering. However, there are indications that systems of higher learning are starting to use formal aspects of project management for the purposes of managing research projects, creating one-stop centers for increased student focus, and improving administrative processes (Burgher & Snyder, 2012a). In addition, there is further evidence that project management has been used to more effectively manage accreditation processes in higher education (Cann & Brumagim, 2008). Further research indicates that implementing project management in higher education can produce more effective, efficient, and timely delivery of services to students, faculty, and staff (Austin et al., 2013). However, a gap in the literature exists in determining the value of project management training efficacy even across traditional project management fields, and a lack of studies exists on project management efficacy (Chiocchio, Rabbat, & Lebel, 2015).

The focus of this study was the lack of project management in higher education and on the influence that self-efficacy with project management experience obtained by faculty and staff may have on project management implementation in the higher education setting. It also sought to determine if previous project management experience of faculty and staff contributed to the implementation of project management tools. Studying how project management may adapt to a higher education environment addressed some gaps in literature, which fail to identify factors that lead to a lack use of project management tools in higher education as opposed to other industries.

Problem Statement

The response to many of the issues that face higher education is to manage the chaos without setting priorities and developing any type of work break-down structures which are

foundational pieces of project management (Burgher & Snyder 2012a). Although some institutes of higher education have implemented project management to reengineer processes, a research gap exists between theory and application within higher education (Austin et al., 2013). Within an educational setting, there are a number of processes that occur, and within these processes, there is often a considerable amount of opportunities for improvement (Maguad, 2007). Accreditation preparation in higher education is an example of such a process in which project management is not commonly used (Badiru, Slagley, & Smith, 2010).

The use of project management is widely known within a variety of industries such as construction and manufacturing; however, project management tools are not commonly applied to academic programs (Badiru et al., 2010). Research suggests that one challenge to implementing project management is a lack of project work experience and the fact that studies related to project management efficacy are rare (Chiocchio et al., 2015). One researcher notes that self-efficacy could play a role in assisting individuals to adopt new techniques and perform tasks more effectively (Lucas, Cooper, Ward, & Cave, 2009).

The problem to be addressed involves the lack of project management techniques at a two-year technical college. Currently, project management is not actively utilized at a two-year technical college although opportunities exist for implementation within each division of the college.

Purpose Statement

The purpose of this quantitative study was to examine the relationship between project management training and the faculty/staff self-efficacy towards the implementation of project management techniques within higher education. Higher education often views project management as not having value outside of construction related industries and considers the

process to be too rigid for application within education (Austin et al., 2013). The work of Burgher and Snyder (2012a) was expanded to determine how project management methods work in traditional settings, such as the construction industry, and to apply project management techniques to higher education. Previous work by Chiocchio et al. (2015) which explored project management self-efficacy in the healthcare industry was expanded in the study. In addition, the study identified gaps in research related to project management implementation in higher education noted by other authors (Austin et al., 2013). The study investigated the effects of project management training on self-efficacy among faculty/staff, as well as how project work experience affects the confidence in the ability to apply project management knowledge.

Nature of the Study

The nature of the study was quantitative and constructed in an experimental research design. A two-year technical college, Southern Crescent Technical College, was the focus of the study. Southern Crescent Technical College has approximately 500 faculty/staff members. A quantitative case study method was most effective in this study because it utilized t-tests to evaluate the self-efficacy of faculty/staff to determine if project management training was relative to project management implementation in higher education. The researcher chose a quantitative study instead of a qualitative study because this study analyzed numerical data related to rates of the confidence in the ability to apply project management and project work experience. The researcher selected experimental research design since the research was based upon applying a specific treatment to a group of individuals and withholding the treatment from another group (Creswell, 2009).

The variables utilized within the t-test and test instruments were analyzed using statistical methods and statistical analysis (Creswell, 2008). The researcher did not select a qualitative

method because it relies upon open-ended questions as opposed to quantitative instrument based questions (Creswell, 2008). A quantitative research method gathers information in an objective manner as opposed to a qualitative method in which information is gathered in a more subjective approach (Stake, 2010).

The research design of the study was based upon experimental research, which attempts to determine if a specific treatment of a group factors into an outcome (Creswell, 2009). To test the first two research questions, a group of faculty/staff were exposed to a project management training exercise. A pre-test was provided to the group prior to the project management training and a post-test was administered after the conclusion of the project management training. The pre-test and post-test was based upon the work of McCreery (2003). The Likert scale instrument addressed research question one and research question two by prompting the participant to respond to the items in "level of self-efficacy improved" and "confidence in ability to apply project management" in the specific areas defined within the Likert scale. The study used the Likert scale instrument to determine the difference between the pre-test and post-test results. Research question one was assessed by comparing the pre-training self-efficacy to the post-training self-efficacy of project management. The study assessed research question two comparing the pre-training confidence in the ability to apply project management knowledge to the post-training confidence in the ability to apply project management knowledge. The increase between the pre-training levels and post-training levels addressed the research question. All the pre-training surveys and post-training surveys were in a Likert scale format ranging from 1 to 7. For the third and fourth research questions, the research of McCreery (2003) was used to develop a tool to access the level of project work experience knowledge. The researcher evaluated the participants according to his or her project work experience by assessing their project work

experience within a range of years. The participants chose between seven different year ranges of project work experience. The study demonstrated that group one consisted of those with less than five years' experience and group two consisted of those with more than five years' experience. Those in group one were assessed as having lower level project work experience while participants in group two were assessed as having higher level project work experience. The fifth research question addressed the level of improvement in self-efficacy among lower level and higher level project work experience faculty/staff. The study utilized a two-sample t-test with unequal variances to determine whether the means of the level of improvement differ between lower level project work experience and higher level project work experience faculty/staff in relation to self-efficacy. Research question six utilized this same process but tests the means of level of improvement between lower level project work experience and higher level project work experience faculty/staff in relation to the confidence in the ability to apply project management.

Research Questions

The primary research question focused on determining if project management training increases project management self-efficacy along with how project work experience among higher education administration can contribute to the implementation of project management practices.

The research questions and hypotheses for the study were as follows:

Questions:

Q1. Would project management training improve self-efficacy for tasks among faculty/staff?

Q2. Would project management training increase the confidence in the ability of faculty/staff in applying project management knowledge?

Q3. Would the project management training have significant impact on faculty/staff with lower level project work experience?

Q4. Would the project management training have significant impact on faculty/staff with higher level project work experience?

Q5. Is the level of improvement in self-efficacy the same for lower level and higher level project work experience faculty/staff after the project management training?

Q6. Is the level of improvement in the confidence in the ability to apply project management knowledge the same for lower level and higher level project work experience faculty/staff after the project management training?

Hypotheses for Q1:

$H_0 1$: $\mu_{post} = \mu_{pre}$ Where μ_{post} is the mean of post-training survey score and μ_{pre} is the mean of pre-training survey score.

There is no significant improvement in self-efficacy among faculty/staff after project management training.

$H_1 1$: $\mu_{post} > \mu_{pre}$

There is a significant improvement in self-efficacy among faculty/staff after project management training.

Hypotheses for Q2:

$H_0 2$: $\mu_{post} = \mu_{pre}$

Faculty/staff's confidence in the ability to applying project management knowledge does not increase significantly after the project management training.

$H_1 2$: $\mu_{post} > \mu_{pre}$

Faculty/staff's confidence in the ability to applying project management knowledge does increase significantly after the project management training.

Hypotheses for Q3:

$H_0 3a$: $\mu_{post} = \mu_{pre}$

There is no significant improvement in project management self-efficacy after the completion of project management training for those with lower level project work experience.

$H_1 3a$: $\mu_{post} > \mu_{pre}$

There is significant improvement in project management self-efficacy after the completion of project management training for those with lower level project work experience.

$H_0 3b$: $\mu_{post} = \mu_{pre}$

There is no significant improvement in the confidence in the ability to apply project management after the completion of project management training for those with lower level project work experience.

$H_1 3b$: $\mu_{post} > \mu_{pre}$

There is a significant improvement in the confidence in the ability to apply project management after the completion of project management training for those with lower level project work experience.

Hypotheses for Q4:

$H_0 4a$: $\mu_{post} = \mu_{pre}$

There is no significant improvement in project management self-efficacy after the completion of project management training for those with higher level project work experience.

$H_1 4a$: $\mu_{post} > \mu_{pre}$

There is significant improvement in project management self-efficacy after the completion of project management training for those with higher level project work experience.

$H_0$4b: $\mu_{post} = \mu_{pre}$

There is no significant improvement in the confidence in the ability to apply project management after the completion of project management training for those with higher level project work experience.

$H_1$4b: $\mu_{post} > \mu_{pre}$

There is a significant improvement in the confidence in the ability to apply project management self-efficacy after the completion of project management training for those with higher level project work experience.

Hypotheses for Q5:

$H_0$5: $\mu_{DL} = \mu_{DH}$

The level of improvement in self-efficacy among faculty/staff with lower level project work experience is the same as those with higher level project work experience after project management training.

$H_1$5: $\mu_{DL} > \mu_{DH}$

The level of improvement in self-efficacy among faculty/staff with lower level project work experience is higher than those with higher level project work experience after project management training.

Hypotheses for Q6:

$H_0$6: $\mu_{DL} = \mu_{DH}$

The level of improvement in the confidence in the ability to apply project management knowledge among faculty/staff with lower level project work experience is the same as those with higher level project work experience after project management training.

$H_1 6: \mu_{DL} > \mu_{DH}$

The level of improvement in the confidence in the ability to apply project management knowledge among faculty/staff with lower level project work experience is higher than those with higher level project work experience after project management training.

Theoretical Framework

The theoretical framework of this study was based upon the self-efficacy of faculty/staff of project management techniques within a higher education setting and how industry experience may influence the establishment of project management techniques in higher education. The research explored how self-efficacy and training in project management techniques can be influential in establishing project management in a higher educational setting. The framework was based upon the research of Bandura (1977) which defines self-efficacy as the level of personal confidence an individual has in completing a goal. Other research supports the framework by adding that self-efficacy conveys an individual's confidence in his or her ability to accomplish a specific task (Hu & Zhao, 2016). Self-efficacy theory is a subset from the larger social cognitive theory (Bandura, 1986).

The research demonstrates how training of faculty/staff in project management techniques may affect self-efficacy of faculty/staff within a two-year technical college. The framework expands upon the work of Chiocchio et al. (2015) who examined if project management training improved the collaboration and increased project success of individuals participating in training. Furthermore, the work of Chiocchio et al. (2015) provided a good

foundational framework to build future research in the area of project management training efficacy. Howardson and Behrend (2015) provided a foundational theoretical piece by describing Bandura's (1997) original theory components and how it relates to pre-training self-efficacy.

There are three parts to the theoretical framework of this study: verbal persuasion, enactive mastery, and vicarious experience which are found within Bandura's (1997) original theory of self-efficacy. The verbal persuasion component of the theoretical framework was used to address the research question that dealt with exposing faculty/staff to a project management training session and measuring the effects of project management efficacy. The enactive mastery and vicarious experience components of the theoretical framework were both used to address the research question that addressed faculty/staff industry experience. Verbal persuasion stems from having others provide information concerning the possibility of successful task performance whereas vicarious experience stems from individuals observing others perform a certain task (Howardson & Behrend, 2015). Finally, enactive mastery arrives from an individual's direct experience with a specific task domain (Howardson & Behrend, 2015).

Verbal Persuasion

Verbal persuasion consists of information, which can influence efficacy beliefs by persuading individuals that they lack or possess the capability to perform certain tasks (Bandura, 1997). Verbal persuasion can also be a symbolic component (Bandura, 1997) such as when a training session provides a supportive climate for learning (Howardson & Behrend, 2015). Even though training may not be a direct source of verbal persuasion, it can provide a supportive climate for training by conveying positive signals to individuals about his or her learning abilities, which can in turn increase pre-training self-efficacy (Howardson & Behrend, 2015).

Verbal persuasion is most effective when the information is provided from a trusted source within the individual's social environment (Bandura 1997). Therefore, the more an individual feels supported by trusted others in reference to training, the higher the verbal persuasion (Howardson & Behrend, 2015). The study used the verbal persuasion component of the theoretical framework to address the research question that deals with exposing faculty/staff to a project management training session and measuring its effect on their self-efficacy.

Enactive Mastery

Enactive mastery happens when individuals assign past performance to his or her own knowledge, skills, or abilities (Bandura, 1997). At the conclusion of a certain behavior, individuals reflect upon his or her progress and assess efficacy beliefs in accordance to his or her level of performance with the hope that efficacy will increase at the conclusion of performance attempts (Vancouver, Thompson, & Williams, 2001). The idea of enactive mastery is found in organizational training research and emphasizes the participant's belief that newly obtained knowledge can be acquired in a learning or training environment (Howardson & Behrend, 2015). Enactive mastery attempts to recall the learner's past experiences, which have attributed to the acquisition of new knowledge and skills for current training (Howardson & Behrend, 2015).

Vicarious Experience

According to Bandura (1997), knowledge of an individual's performance cannot establish estimates of one's ability, or self-efficacy, without a measurable reference point. Vicarious experience is the assessment of an individual's own ability and efficacy through a social reference of obtaining information from others' performance (Howardson & Behrend, 2015). To further explain, a person may perceive a high ability to perform a task by observing another person successfully perform the same task (Howardson & Behrend, 2015). When an individual

observes others successfully perform certain tasks, it increases efficacy by providing important information concerning how to perform the task (Bandura, 1997). Vicarious experience contains an element of enactive mastery, which means that vicarious experiences utilize others who have mastered the task as a point of reference (Howardson & Behrend, 2015). The enactive mastery and vicarious experience components of the theoretical framework are both used to address the research question that addresses faculty/staff industry experience.

Definition of Terms

Enactive mastery: an individual attributes past performance to his or her knowledge, skill set, or abilities (Bandura, 1997).

Functional organizational structure: an organizational structure in which individuals are organized in groups that perform the same type of function or have similar expertise or skill set (Gido & Clements, 2015).

Gantt chart: a graph of the activities of the project depicted as a time-scaled bar line chart, also known as a bar chart (Larson & Gray, 2011).

Microsoft Project: a commonly used software system used in the business environment to manage and control projects (Gido & Clements, 2015).

Project management: the planning, organizing, coordinating, leading, and controlling of resources to achieve the objective of a project (Gido & Clements, 2015).

Project office (PO): a centralized unit within an organization that oversees and supports the management of projects (Larson & Gray, 2011).

Self-efficacy: the confidence that a person has in his or her abilities to undertake a range of activities to complete tasks or goals (Bandura, 1997).

SMART: a system developed to set objectives in order to achieve strategies, which include establishing objectives that are specific, measurable, assignable, realistic, and time related (Larson & Gray, 2011).

Statement of work (SOW): a document that outlines the major task or tasks to be required by the customer or project team to perform in order to accomplish the project scope and produce the deliverables (Gido & Clements, 2015).

Verbal persuasion: information from social influences which can persuade efficacy beliefs by convincing individuals that he or she has the ability or lacks the ability to perform a task (Bandura, 1997).

Vicarious experience: the assessment of an individual's ability and efficacy through a social reference by obtaining information from others' performance (Howardson & Behrend, 2015).

Work breakdown structure (WBS): a hierarchical method that divides the work of the project into smaller detail (Larson & Gray, 2011).

Assumptions, Limitations, and Delimitations

Assumptions

The assumptions associated with this study include implementing project management training which can produce results within a limited amount of time. This is based upon the amount of data available to verify the results. A second assumption is that project management techniques can be effectively applied to a higher education setting based upon the historical use of project management being primarily used in construction and manufacturing industries. A third assumption is that the sample from the two-year technical college studied would adequately represent the population.

Limitations

Limitations of the study include the fact that project management is not one that is typically associated with higher education (Burgher & Snyder, 2012a). In addition, project management generally does not satisfy budget, scope, and schedule control often required by top management (Larson & Gray, 2011). Other research indicates that there is a lack of project management present in higher education and provides evidence of how project management can benefit higher education along with what is required to sustain project management efforts (Austin et al., 2013). Another limitation is difference in culture between industry and higher education. Therefore, it is important that the proper amount of research be conducted when engaging in project management and that all the different factors that may define the best strategies of communication and the optimal use of human resources be taken into account (Baia & Marques, 2014).

There are also specific limitations to the quantitative research design method of conducting experimental research. These limitations include those related to procedures used within the experiment, manipulations of the experiment from the researcher, and variances in the selection of the participants (Creswell, 2009). In addition, the information gathered from the participants may be filtered through the viewpoints of the individuals participating in the study (Creswell, 2009). Finally, the views of the participants may not be equal in perception and may not equally articulate information (Creswell, 2009). According to Stake (2010), all research contains some form of bias so; every effort should be in place to reduce the limitations of researcher bias.

Delimitations

The scope of this study includes determining how project management training affects the self-efficacy of faculty/staff in the implementation of project management techniques in higher education. The boundaries of the study are limited to determining if project management can be implemented into a higher education environment based upon faculty and staff project management self-efficacy. In addition, the study is limited to the role of industry experience plays in implementing project management practices. The scope of the study includes the project management techniques and team building methods to determine if these project management methods are a viable option considering the functional organizational environment of higher education. The specific types of project management tools that are most effective in higher education are undefined and lay outside of the scope of the study.

Significance of the Study

Reduction of Gaps

This study addressed the research gaps that exist in applying project management in a higher education setting. According to literature, there is a lack of research related to the implementation of formal project management in higher education (Austin et al., 2013; Burgher & Snyder, 2012b; Stewart-Mailhiot, 2015). Although project management is well documented in traditional applications, it is far less common within an academic setting (Clark, 2008; Badiru et al., 2010). More specifically, studies that examine project management training efficacy are limited, and there is no evidence of previous meta-analysis on project management training efficacy (Chiocchio et al., 2015). This can create both a challenge and opportunity to develop the concepts within the contexts of higher education. Therefore, this study helped determine

why gaps may appear in the research and how training self-efficacy may play a role in applying project management techniques in higher education.

Implications for Biblical Integration

There are many examples of how project management and project operations played a role in biblical events. For example, in Genesis 6:9-22 (NIV) Noah constructed the ark according to God's specifications. God provided Noah with detailed instructions on the dimensions of the ark and God's use of the ark was a temporary project in relation to His plan of flooding the earth. In the case of Noah, he demonstrated self-efficacy of trusting God's command and not yielding to those around him, which chose not to believe. Project management can also be traced back to the Old Testament during the construction of Solomon's temple. In I Kings 6 and 7, (NIV) there were specific instructions and plans for the temple. It was not an unorganized project, but one that was commissioned by God with detailed construction information. God ordered that each step or phase of the project be carried out in such a way to ensure timely construction and attention to specific detail. This required the management of resources and personnel to complete the project successfully. The project work experience of skilled laborers and masons was put to the test in meeting the specific demands for the construction of the temple.

Another example includes the book of Nehemiah and the efforts to rebuild the destroyed walls of Jerusalem. Nehemiah exemplified the concept of a project manager as he coordinated an important project for God's people. The city of Jerusalem was devastated and its people lacked the experience and confidence to make the necessary repairs. However, Nehemiah demonstrated self-efficacy by the confidence he showed to the people of Jerusalem that the project could be completed. The story of Nehemiah showed how to organize human resources,

effectively move materials, and complete a task in an efficient manner. Nehemiah exemplified skills related to project management by completing the reconstruction of the walls of Jerusalem in 52 days with speed and quality workmanship. The story also demonstrates one of the strategies of project management by assigning each person a specific role in the completion of the wall where each family took a vested interest in the section of the wall in proximity to their homes.

Project management can also be used to improve processes that are already in existence such as in this study. Utilizing project management can be useful in becoming more effective in our personal lives by adding value to those around us and being more productive in the kingdom of God just like Nehemiah's management of the reconstruction of the city walls adds value to lives of the Israelite people.

Relationship to Field of Study

This study directly relates to the field of project management by determining the environment of higher education and if project management training for faculty and staff influences self-efficacy in a two-year technical college. Knowledge and literature gained through project management in other industries was utilized to assess application within the higher education organizational setting. The focus of the study was to extend research related to project management and self-efficacy into a higher education setting.

A Review of the Professional and Academic Literature

The approach of this literature review was for the reader to develop a more comprehensive understanding of project management and how project management training can affect self-efficacy as it relates to higher education. An overview of general project management application in higher education is discussed, followed by research that is related to culture and

leadership of project management. The literature review provides evidence of a lack of research in the area of project management in higher education and further explores if the conditions of higher education can support specific techniques of project management. Finally, the literature review presents information related to the challenges of project management techniques in higher education, along with identifying conditions that would be favorable to support the application of project management concepts.

Although the literature on the subject of project management implementation in higher education is limited, there is sufficient literature to support the research. This research was based primarily around the work of Burgher and Snyder (2012a), Burgher and Snyder (2012b), McCreery (2003), Chiocchio et al. (2015), and Austin et al. (2013). These works of literature provide the foundation of research in the area of project management application in higher education. Other works of literature provide to fill research gaps that may exist in applying project management in higher education.

An Overview

Institutions of higher education are experiencing increased financial hardships because of declining revenues, poor budget management and slow economies (Maguad, 2007). Other authors contend that higher education in the United States is dealing with an image problem and is failing due to increased cost (Gordon & Fischer, 2011). Higher education has also fallen victim to diseconomies of scale in that enrollment has not kept pace with total spending per student and administrative cost per student (Gordon & Fisher, 2011). Other authors add that social changes due to globalization and a growing need for knowledge has pushed higher education institutions to demand greater efficiency (Costa, Maccari, Martins, & Kniess, 2014). In response to the growing concern for more effective budget controls and quality management,

universities should consider incorporating project management strategies into operation processes to improve performance (Maguad, 2007). A recent survey of project management indicated that project management techniques could address some of the demands for greater efficiency, and reductions in public funding while generating additional income for universities (Bryde & Leighton, 2009).

The use of project management is typically connected with construction, manufacturing, and process reengineering. Crawford and Helm (2009) added that there are uses that are more nontraditional by recognizing that project management has begun to find a place in government initiatives in various countries, which is generally associated with an increased need for improved scrutiny of public expenditures. However, there are indications that systems of higher learning are starting to use formal aspects of project management for the purposes of managing research projects, creating one-stop centers for increased student focus, and improving administrative processes (Burgher & Snyder, 2012a). The traditional systems of academic management are becoming obsolete and ineffective, which opens the way for the establishment of project management techniques in an academic setting (Costa et al., 2014). Since most work could be considered project work, applying project management techniques to higher education should be addressed. In fact, whether it is a strategy that needs to be implemented or a policy, the method of delivery typically takes on the form of a project; therefore, project management can be used as a means to achieve outcomes while generating traceability and accountability (Crawford & Helm, 2009). Although the work of Crawford and Helm (2009) is not specific to project management in higher education, it does provide insight into the expectations and the value of project management in a government context, with particular interest into public sector application of project management techniques.

The works of Austin et al. (2013) pointed to the importance of developing leadership to support project management in higher education. Evidence shows that the lack of subject matter experts in the area of project management within systems of higher education results in less than optimal project management results (Austin et al., 2013). It is noted that the key to successful project management in industry is in relation to management and leadership styles along with a supportive merger of the two (Austin et al, 2013). Burgher and Snyder (2012b) support this theory by expressing the need to first examine the environment of higher education to determine if the management structure is conducive to project management implementation. Earlier literature by Burgher and Snyder (2012a) provided further study of how project management can be applied to higher education and how the environment of higher education plays a role in application of project management.

Research suggests that organizations such as higher education can utilize project management techniques to overcome the challenges they currently face and become centers of academic excellence (Burgher & Snyder, 2012a). Other research indicates that there is a lack of project management present in higher education and provides evidence of how project management can benefit higher education along with what is required to sustain project management efforts (Austin et al., 2013). Other literature declares that the traditional view of project management is not one that is typically associated with higher education; however, the tasks of higher education are, in fact, projects, which require the expertise and tools of project management (Burgher & Snyder, 2012a). van Rooij (2011) wrote that project management can be used in a variety of industries and can be applied to a wide range of project types with various project sizes. Based upon this research, there is room for discussion of how project management techniques can be applied to systems of higher education.

The Discipline of Project Management

Project management has a history that dates back to the dawn of humanity but was not formally recognized as an organized systematic set of tools and techniques until the 1950s (Seymour & Hussein, 2014). Others wrote that project management was present during the construction of the ancient pyramids and other prehistoric structures; however, any use of the formal term of project management was absent at that time (Morris, 2013). Even though World War II saw many different projects coordinated and completed, the use of formal project management terminology was not used (Morris, 2013). However, the research and development office of the United States Air Force (USAF) established Project Offices in 1951, which officially created the formal discipline of project management (Morris, 2013). Other authors contend that formal project management began with the Polaris project under the guidance of the United States Navy in 1958 through the creation of the Program Evaluation Review Technique (PERT), which served the purpose of visualizing scheduling scenarios (Seymour & Hussein, 2014).

The discipline of project management has expanded due in part to several different reasons. Burgher and Snyder (2012a) wrote that the expansion of project management is related to a compressed product life cycle where speed of information has demanded faster and more efficient response times. The increase of global competition and the expansion of knowledge has placed pressure on organizations to more move quickly (Burgher & Snyder, 2012a). Finally, increased customer demand and focus have resulted in finding new solutions to meeting the demands of clients (Burgher & Snyder, 2012a). These concerns are not limited to industry but are also related to higher education, which adds to the need to further research how project management can respond in the arena of higher education (Burgher & Snyder, 2012a). Other

authors note the deficit of formal project management as a discipline in higher education but contend that implementation can be beneficial when compared to its success in other industries (Austin et al., 2013).

Other authors support the notion that project management has a place outside of its traditional use, including higher education (van Rooij, 2011). However, it is necessary to determine the level of commitment that an organization of higher education has towards the establishment of project management within its processes (van Rooij, 2011). Other authors that note the battle between implementing project management and the executive leadership of higher education (Austin et al., 2013) point this out. As of now, there does not appear to be a universal acceptance of the discipline of project management in higher education (Clark, 2008).

The Environment of Higher Education Relative to the Business Environment

Most literature refers to three types of organizations and determines which type of organization can greatly affect projects (Laxton & Applebee, 2010). These three types of organizations include functional organizations, pure project organizations, and the matrix organization (Laxton & Applebee, 2010). Burgher and Synder (2012a) concurred with these three types and agree that functional organizations position employees into specialized functions and that these types of organizations are hierarchal in nature, meaning that instruction is received from one particular individual. Laxton and Applebee (2010) added that pure project organizations are project teams that are created around specific projects as opposed to functions. Team members are responsible for reporting directly to a project manager and are often relocated to other project teams as needed (Burgher & Synder, 2012a). Finally, Laxton and Applebee (2010) discussed the most common form, which is the matrix organization. This type of

organization is known for assigning team members on a part-time basis to work on a project while also remaining functional in a particular role (Laxton & Applebee, 2010).

The academic world is different in nature than a corporate setting, and therefore, the participant in project management training may be contingent upon the setting (McCreery, 2003). The higher education environment varies from the business environment in that higher education is typically characterized by informality and irreverence, while the business environment demands uniformity over production and control over quality (Costa et al., 2014). In reference to the differing types of environments, Burgher and Snyder (2012a) described the importance of conducting an environmental scan of the organizational structure. Different organizational structures exist with an entity, and different authors describe these structures through various definitions. As previously mentioned, there are three primary types of organizations; however, some authors go farther to explain other types of organizations that may exist. Mintzberg (2009) discussed different types of organizations which includes adhocracy. This type of organization is based upon creativity and freedom, which can produce blurred lines of communication and create the possibility of bypassing the chain of command (Mintzberg, 2009).

Higher education institutions are good examples of adhocratic organizations because of highly specialized subject matter experts, which are divided into functional units (Costa et al., 2014). The work of Burgher and Snyder (2012b) provided a description of matrix organizations that coincides with adhocratic organizations by stating that functional systems are often marked by independent work assignments and limited communication for lower level to upper level employees. This type of organization can create some measure of complexity within the environment of operation due to the expertise of various tasks (Costa et al., 2014). Other authors

choose to simply classify organizations or industries using project management as either as traditional or non-traditional (Cartwright & Gale, 1995). The argument would be that traditional project management organizations are those with project-based systems, while non-traditional are only users of project management techniques or projects teams for specific tasks (Cartwright & Gale, 1995).

In contrast, the business sector is one that is marked by a defined customer, market, and product ratio, while most higher education institutes are more concerned with the relationship between tuition and education (Costa et al., 2014). Higher education is also concerned from a student/client and knowledge/product point of view. However, some argue that the management styles of the business sector are not functional in the higher education environment (Birnbaum, 2001). According to Birnbaum (2001), many of the current business methodologies are only fads in which higher education is attracted to integrate to become increasingly efficient. However, Birnbaum (2001) pointed out the academic system and the business sector have different goals and culture respective to each, which would prevent the successful implementation of business management principles. Birnbaum (2001) noted that business seeks to maximize profits while higher education should be committed to a culture of valuing learning and searching for truth, resulting in a clash between the two cultures.

Domain of Strategy in Project Management

Gaining a better understanding of the strategy involved in project management provides a foundational piece to the goals of the project. According to Moran and Youngdahl (2008), strategy is what guides the project and helps create project value. One selected article describes what project strategy really is and how it can add value to traditional project work (Patanakul & Shenhar, 2012). As competition has increased, the need for better project management

techniques has also risen. Researchers suggest that strategic project management is the missing link that can address some of the issues of modern project management (Patanakul & Shenhar, 2012). The use of strategic project management does not eliminate traditional techniques but rather adds to the mindset for increased efficiency (Patanakul & Shenhar, 2012). The article describes project strategy as a guide to the project during its planning and execution phase (Patanakul & Shenhar, 2012). The overall purpose of the article is to provide a framework for studying, developing and implementing the idea of project strategy and to demonstrate how strategy can be found in almost any project (Patanakul & Shenhar, 2012). The study conducted within the article reveals that there is a link between implementing strategic project management and the success of the project (Patanakul & Shenhar, 2012).

Other research on strategic management in relation to project management focuses on identifying and assessing value in a project portfolio (Martinsuo & Killen, 2014). The expectation of any project is to add value to the stakeholders. Historically, project-based management is primarily focused on a rational analysis of the problem and a solution. Martinsuo and Killen (2014) focused on value management in their research and focus also on developing a foundation in the social processes of a project. Most research of project management portfolios reveals a connection, which provides balance and strategic alignment with the organization's goals and objectives (Martinsuo & Killen, 2014). These authors suggest additional research in the area of value maximization with particular emphasis on non-commercial environments and nonprofit organizations. These environments and organizations still face some of the same types of challenges of project decision-making as many for-profit organizations (Martinsuo & Killen, 2014). Martinsuo and Killen (2014) addressed two key issues related to increasing strategic value. The first issue is how strategic value is measured in relation to the project portfolio

management framework. A second issue exists as to how the framework of the project management portfolios could be reconstructed to more effectively measure and account for strategic value (Martinsuo & Killen, 2014).

Further research discusses the relationship between corporate strategy and the financial aspects of project management (Vitolo & Cipparrone, 2014). The authors focus on how strategic management plays a role in project selection and on any implications that the project may have on the organization as a whole. The article evaluates the gaps that are often created between project selection and the strategies of the organization. The authors address a number of factors related to project management and the importance of strategic management alignment (Vitolo & Cipparrone, 2014). The article uses a series of financial criteria to measure strategic alignment, but it does offer some insight into how influencing strategy can make the difference between project success and project failure (Vitolo & Cipparrone, 2014).

Strategic management also plays a role in the creation and sustainment of project vision. Research by Christenson and Walker (2004) addressed the strategic role of communicating vision in the success of project management. The authors contend that little research has been conducted on the development and effects of communicating project vision, along with how it may impact the success of the project (Christenson & Walker, 2004). According to the article, project vision is the most significant factor that contributes to project success, and maintaining the vision will also impact the outcomes of the project (Christenson & Walker, 2004). In addition, one must also consider the impact of the stakeholders' relationships and influence along with the organizational strategy, structure, and culture (Christenson & Walker, 2004).

The article identifies the concepts of project vision which are developed around literature related to corporate vision (Christenson & Walker, 2004). Later, it addresses examples of

common failures and successes from relevant literature, which are drawn back into how it applies to project management practice and strategic development (Christenson & Walker, 2004). The article stresses the importance of a project management leader being able to align the strategic goals of the projects and demonstrate a commitment to success (Christenson & Walker, 2004). Furthermore, since projects involve many different groups of people, it is necessary for all the stakeholders to understand the strategic goals of the project and be able to internalize these goals by making them their own (Christenson & Walker, 2004). To assist with the development of strategic goals specific to project management, the SMART concept is often used to provide some guidance (Pressly, 2012). The SMART concept is an acronym for specific to the project, measurable, attainable, reliable, and timely (Pressly, 2012).

Research contends that there is a correlation between an organization's strategy, the established project management system at work, and the selection of the project chosen to implement its strategy (Cooke-Davies, Crawford, & Lechler, 2009). This idea is based upon a model patterned from literature related to strategic management and takes into account the degree of fit between an organization's strategic drivers and the type of project management system in place (Cooke-Davies et al., 2009). In fact, organizations can reap benefits from strategic implementation by utilizing project management principles, creating project parameters, and defining project tasks (Pressly, 2012). However, other authors caution that organizations should determine a method to measure the return on investment of project management initiatives to determine their worth (Thomas & Mullaly, 2007). The strategic drivers affect the value that an organization can expect from its project management; therefore, the project management system should be relative to a specific strategic goal for each organization so that the maximum value is achieved (Cooke-Davies et al., 2009).

In relation to higher education and any other organization considering project management implementation, the concept of how it fits is one of concern. Thomas and Mullaly (2007) identified three variables that are likely to influence a project management implementation process. First, if project management techniques do fit within the context of the organization's strategic design, then desired results may not be produced (Thomas & Mullaly, 2007). Secondly, there may be other elements within an organization that may jeopardize the success rate of the project management initiative (Thomas & Mullaly, 2007). Finally, there should be an account given for the amount of time between project management implementation and the time when the benefits of the initiative take place (Thomas & Mullaly, 2007).

Culture and Leadership of Project Management

Culture is what binds individuals of a profession to create a community and ensures continuous guidance of its members (Wang, 2001). In relation to project management, it also has its own professional culture, and it is important to identify dimensions of project management culture that are necessary for project success (Wang, 2001). The authors Baia and Marques (2014) pointed out that culture can be viewed as an iceberg in that the most sensitive elements of a culture are often visible; however, an even larger number of cultural aspects, such as assumptions, may not be as visible. Therefore, the author notes that it is important that the proper amount of research be conducted when engaging in project management and that all the different factors that may define the best strategies of communication and that the optimal use of human resources be taken into account (Baia & Marques, 2014). Gaining a knowledge of the cultural aspects involved is critical in negotiations, communication efforts and building relationships (Baia & Marques, 2014). Wang (2001) wrote that professional culture is important in any profession, and project management is no different. Wang (2001) also identified a model

for establishing a project management culture to ensure project integration and professional commitment to project work.

In addition to the five processes associated with project management – initiating, planning, executing, monitoring and controlling, and closing – there is also an express need to gain a knowledge of the environment surrounding the project (Williams van Rooij, 2011). Project management success also depends upon the ability of management to provide leadership through gaining knowledge, experiences, and skills (Anderson, 2010). Other authors contend that gaining an understanding of general management skills and determining interpersonal skills are essential to project management implementation (Williams van Rooij, 2011). In relation to implementing project management techniques in higher education, there are specific enablers that are necessary to support project management techniques such as agile (Conforto, Salum, Amaral, da Silva, & Magnanini de Almeida , 2014). Leadership is certainly one of those enablers since project management requires focusing on day-to-day activities while also focusing on achieving long-term goals (Austin et al., 2013). When comparing the environments of higher education and the business sector, some authors point to the importance of leadership attributes (Austin et al., 2013). Burgher and Snyder (2012a) wrote that leadership skills and good management are essential to the integration of project management.

According to research, adopting project management tools directly relates to the establishment of project management culture and leadership characteristics (Conforto et al., 2014). Relative to the study of determining if the conditions of higher education can support project management, it is necessary to investigate which enablers, such as culture and leadership, are currently present in higher education, along with which types of enablers are necessary to further develop project management (Conforto et al., 2014). Studying the elements of higher

education becomes important in order to determine how project management can be integrated. This is supported by research that indicates higher education focuses on theory, rather than implementation, which can lead to a lack of project management support and the cultural environments that make integration possible (Austin et al., 2013). Finally, literature supports the idea that project management training can be used to establish an organizational culture that incorporates project management, which moves away from traditional academic ad-hoc committee models (Stewart-Mailhiot, 2015).

Application of Project Management in Higher Education

Understanding the value of project management in higher education begins with developing a better understanding of how project management can be applied to the public sector which lies outside of the normal application of private industry (Crawford & Helm, 2009). The documentation of project management in the private sector is readily available; however, within the public sector, there is less availability of research. Van der Waldt (2011) supported this idea by noting that most project management textbooks focus primarily on private sector industries with little information concerning project management application in public settings such as government. There is no concise definition to describe the public sector and private sector, respectfully (Van der Waldt, 2011). However, the primary difference between the two sectors is related to drivers of the individual sectors, which for the private sector is profit and service delivery for the public sector (Van der Waldt, 2011).

According to an ANOVA analysis conducted by Serrador and Turner (2015), implementing project management can have high success rates outside of construction industries such as education. The study also considers the most important factors in education that are relative to project success, which can help shed light on what aspects of higher education can

lead to agile project management support (Serrador & Turner, 2015). Other authors examine how project management can benefit higher education, the leadership traits that support project management integration, and what is necessary to sustain project management methods (Austin et al., 2013). Another example of project management in higher education is a teaching project. The teaching of a course in higher education meets the basic features of a project in that it has a clearly defined start date, distinguished phases of the course life cycle, scope, course schedule, and a defined end date (Sobanska, Wencel, & Kalinowski, 2014).

There are several examples of project management currently present in higher education, although there are no universally accepted project management principles in higher education (Clark, 2008). The article by Clark (2008) described the role, organizational structure, and the cultures related to project management in higher education. Clark (2008) used multiple examples of how project management is used across several prominent universities in each respective IT department to manage projects and to establish a culture that supports change. Other examples include literature on how systems of higher learning use a variety of project-based models to integrate professional development through interactive online projects (Tynan, Adlington, Stewart, Vale, Sims, & Shanahan, 2010). The authors go on to further explain that different project management approaches may be necessary within various higher education areas (Tynan et al., 2010). Others point to the functions and activities of university faculty in relation to specific administrative tasks that are required, such as faculty meetings, committees, and other related items (Sobanska et al., 2014). These types of administrative activities are viewed as an organizational process which can be viewed as project management (Sobanska et al., 2014).

Another example of project management within higher education is found in the research conducted by Johnston and Wierschem (2007). This research explores how project management is used in the IT departments of higher education to address the demand of increased technology and uses survey data to determine project management practice in respect to institution size (Johnston & Wierschem, 2007). The research objectives of the article focus on determining the project management practices in the higher education environment, which involves considering its use in private versus public institutions (Johnston & Wierschem, 2007). Other authors note that the overwhelming majority of research related to project management in higher education is dedicated to IT departments and the functions of IT within systems of higher education (Austin et al., 2013). The methodology used in the research included gathering data through survey questions, which focused primarily on the usage of project management tools and techniques in various size institutions (Johnston & Wierschem, 2007).

Stewart-Mailhiot (2015) provided one other example of project management utilization in higher education. She suggested that librarians can utilize project management techniques to implement new ideas, improve services or space usage, or to address an issue related to the day-to-day operations of the library (Stewart-Mailhiot, 2015). Zhang and Bishop (2005) recognized the use of project management tools within higher education libraries is driven by the increased demand of technology and efficiency. The University of Central Florida (UCF) has met this challenge by implementing Microsoft Project 2000 to manage the expansion of its e-reference service to all of the UCF campuses in response to an increased demand for research assistance (Zhang & Bishop, 2005). As technological changes are experienced in libraries, project management tools can provide practical methods to effectively manage projects by defining the

project's scope, resources, time, and costs during the lifecycle of the project (Zhang & Bishop, 2005).

Other cited examples of the application of project management in higher education include the work of Laxton and Applebee (2010). Laxton and Applebee (2010) wrote that project management was utilized in the development of eLearning programs at the Australian Catholic University as a means to introduce new learning management systems, provide professional development of faculty, and implementing new eLearning policies. For this particular application, an external project manager and eLearning specialist was engaged along with a project team consisting of university faculty and staff (Laxton & Applebee, 2010).

The work of Burgher and Snyder (2012a) offered an in depth insight into project management integration in non-profit and higher education. The authors provide a two-part series of articles describing the foundations of project management and the project plan in higher education. Burgher and Snyder (2012a) focused on the project management foundations of employee behavioral characteristics and demonstrate how project management can be used in most areas of higher education. Those involved in education administration are often bombarded by endless tasks and projects (Burgher & Snyder, 2012a). However, project management techniques can provide work plans, which convey established goals, efficient schedules, milestones, and assessment of results (Burgher & Snyder, 2012a).

Burgher and Snyder's (2012a) second installment of project management in higher education goes farther to explain how the integration of a project plan, or "work plans," allow employees in higher education to travel in the same direction. The concept of "work plans" is that they work to prevent over-scheduling of resources while also supporting project prioritization, scheduling efficiency and the delivery of quality work (Burgher & Snyder, 2012a).

In addition, work plans assist in establishing prioritization and comparison to competing projects demanding their time (Burgher & Snyder, 2012a). Other literature supports the idea of project management establishing project prioritization in higher education along with reducing redundancy of work (Austin et al., 2013).

The work of Austin et al. (2013) provided the most closely matched research relative to the application of project management in higher education. The methodology of the research is based upon using survey data and research to determine how a specific college compares to other colleges that have implemented project management (Austin et al., 2013). The research questions presented in the article address how higher education can benefit from the use of project management and what leadership skills are required to implement project management and sustain project management techniques (Austin et al., 2013). The results of the research indicated that less than 10% of schools of higher education maintained a project management office and most of which were contained within the IT department (Austin et al., 2013). Other conclusions from the research included studying key leadership styles that are present in construction project management and describing how similar leadership styles may be beneficial in the execution of project management with higher education (Austin et al., 2013).

However, there are gaps in research in how project management can be applied to higher education. Some authors point out that there is a lack of formal project management in higher education, and what information is available is limited to IT departments and IT functions with higher education institutions (Austin et al., 2013). Burgher and Snyder (2012b) further added that the utilization of project management methods within higher education is rare, and the efficient application of project management technique is even rarer. Clark (2008) added that

there are no universal project management structures established with higher education, which extends the need to expand upon the research.

Other research provides evidence of project management in higher education and seeks to determine the value of project management training in a higher education setting (McCreery, 2003). According to McCreery (2003), research was conducted within two graduate level project management courses, which consisted of using a project management simulation exercise. The exercise set out to determine if the participants increased their knowledge of project management as a result of the training, to assess their confidence in the ability to apply the project management skills gained, and to test the effect of previous project work experience in contexts of the training (McCreery, 2003). This type of research was supported by the work of Kolb, Osland, and Rubin (1995) which noted that people tend to learn through a process of experimentation and conceptualization. Learning through conceptualization is typically connected to traditional methods of learning such as classroom and lectures, whereas experimental learning is the action of testing conceptual knowledge through the application of specific situations (Kolb et al., 1995). The research also demonstrates a link between the self-efficacy in one's ability to effectively apply the knowledge gained in project management training and other research of self-efficacy (McCreery, 2003).

After a thorough review of the literature, there is limited research available on project management training within a higher education setting. However, there is literature on the benefits of project management training within most modern enterprises (Ramazani & Jergeas, 2013). Due to the increase of project based work, presenting effective project management education and training to those individuals responsible for carrying out the work is becoming more critical (Ramazani & Jergeas, 2013). Other authors note this increase in demand for

training by emphasizing the need to invest in the area of project management development and training efforts (Winter, Smith, Morris, & Cicmil, 2006).

Self-efficacy Theory

Social cognitive theory is grounded in the perspective that individuals function as anticipative, purposive, and self-evaluating towards their motives and actions (Bandura, 2001). Self-efficacy is subsumed out of the social cognitive theory and focuses on one's belief to have the ability to mobilize cognitive and behavioral resources to accomplish a particular task (Bandura, 1997). Efficacy itself is derived from four principle sources, which include enactive mastery, vicarious experience, verbal persuasion, and emotional arousal (Bandura, 1977). Self-efficacy beliefs control an individual's functioning through cognitive, motivational, affective, and decisional processes (Bandura, 1997). Bandura and Locke (2003), state that self-efficacy beliefs affect how individuals think about self-enhancing ways in which they motivate themselves in the face of difficulties, his or her emotional quality, and choices made at important decision points. According to Landino and Owen (1988), efficacy influences the activities that an individual will choose, the amount of effort expended, and how long the effort will be sustained throughout the task. Within the context of organizational behavior, there is meta-analytic research that demonstrates a link between self-efficacy beliefs for an individual's job and improvement in workplace performance (Stajkovic & Luthens, 1998).

Self-efficacy is an individual's judgement concerning how he or she can perform on a certain task (Blomquist, Farashah, & Thomas, 2016). A person is more likely to repeat or engage in a certain behavior if he or she believes they are capable of attaining a valued outcome (Blomquist et al., 2016). Other authors claim that human behavior is significantly motivated and controlled by self-influence (Locke, 2009). Others also add that the more confidence a person

has in his or her ability to perform a certain task, the more likely they are to engage in the activity, pursue higher goals than normal, maintain persistence, and ultimately be successful (Miles & Maurer, 2012). Self-efficacy increases an individual's willingness to invest additional effort and master a challenge, and therefore it plays an important role in increasing work effectiveness, job satisfaction, and productivity (Blomquist et al., 2016). Bandura (2012) added that after 30 years of research, increasing an individual's beliefs in self-efficacy promotes efficient self-regulation and enhances motivation, persistence, and performance attainment.

Bandura's (1997) original theory of self-efficacy can be broken down into four basic beliefs with the first being enactive mastery. Enactive mastery happens when individuals assign past performance to his or her own knowledge, skills, or abilities (Bandura, 1997). At the conclusion of a certain behavior, individuals reflect upon his or her progress and assess efficacy beliefs in accordance to his or her level of performance with the hope that efficacy will increase at the conclusion of performance attempts (Vancouver et al., 2001). Other authors write that the more previous performance is viewed as authentic relative to the tasks that will be undertaken in the future, the higher the impact of self-efficacy (Lucas et al., 2009). The idea of enactive mastery is found in organizational training research and emphasizes the participant's belief that newly obtained knowledge can be acquired in a learning or training environment (Howardson & Behrend, 2015). Enactive mastery attempts to recall the learner's past experiences, which have attributed to the acquisition of new knowledge and skills for current training (Howardson & Behrend, 2015). However, not all work experience can be assumed to have consequential effects on self-efficacy. Those performing daily routine activities should expect to increase his or her level of self-efficacy to the level that matches basic routine functions; however, for self-efficacy

to increase the experience must be authentic and similar to the levels of performance desired (Lucas et al., 2009).

A second self-efficacy belief of Bandura's (1997) original theory is vicarious experience. According to Bandura (1997), knowledge of an individual's performance cannot establish estimates of one's ability, or self-efficacy, without a measurable reference point. Vicarious experience is the assessment of an individual's own ability and efficacy through a social reference of obtaining information from the performance of others (Howardson & Behrend, 2015). To further explain, a person may perceive a high ability to perform a task by observing another person successfully perform the same task (Howardson & Behrend, 2015). When an individual observes others successfully perform certain tasks, efficacy increases by providing important information concerning how to perform the task (Bandura, 1997). Vicarious experience contains an element of enactive mastery, which means that vicarious experiences utilize others who have mastered the task as a point of reference (Howardson & Behrend, 2015). The primary focus of vicarious experience is not so much about a positive or negative view of someone who has mastered a task but rather how much an individual respects the person's judgement surrounding the quality of his or her performance (Lucas et al., 2009). The point with vicarious experience is observing others within a given task that have creditable judgement and thereby increasing his or her own self-efficacy (Lucas et al., 2009).

Verbal persuasion is the third element of Bandura's (1997) original theory. Verbal persuasion consists of information, which can influence efficacy beliefs by persuading individuals that he or she lacks or possesses the capability to perform certain tasks (Bandura, 1997). Verbal persuasion can also be a symbolic component (Bandura, 1997) such as when a training session provides a supportive climate for learning (Howardson & Behrend, 2015). Even

though training may not be a direct source of verbal persuasion, it can provide a supportive climate for training by conveying positive signals to individuals about their learning abilities, which can in turn increase pre-training self-efficacy (Howardson & Behrend, 2015). Verbal persuasion is most effective when the information is provided from a trusted source within the individual's social environment (Bandura 1997). Therefore, the more an individual feels supported by trusted others in reference to training, the higher the verbal persuasion (Howardson & Behrend, 2015). Encouragement received from an individual that is considered to be successful is viewed as useful and often more credible towards another's work performance (Lucas et al., 2009).

According to Bandura (1997), enactive mastery has the most prominent influence on self-efficacy beliefs and verbal persuasion has the least influence as a self-efficacy source. Other authors agree that adding enactive mastery provides the strongest link for altering efficacy beliefs and achieves this by providing direct performance information for the foundation of stable and accurate efficacy judgments (Stajkovic & Luthens, 1998). Other studies point to the importance of vicarious experience by reporting in one study that individuals that spoke with highly effective performers several times per week demonstrated a significant level of social communication and the development of an accurate self-appraisal (Lucas et al., 2009).

Project Management Training Self-efficacy

In the field of project management, the ability to measure the skill level of project managers is not only important for practical reasons but could also answer some academic questions (Blomquist et al., 2016). From a practical standpoint, those selecting the most appropriate project manager for a specific project need to be able to use indicators of performance (Blomquist et al., 2016). Academically, a useful scale to measure project

management self-efficacy could assist in improving project management training and education and therefore increase the comparability of research results within industries and project results (Blomquist et al., 2016). Other authors contend that this suggests a need to provide project management training that develops competencies that increase project success (Ramazani & Jergeas, 2015). The questions that arise are how to predict project management performance and how to ultimately evaluate project management training success levels (Blomquist et al., 2016).

In literature, there is a relationship between self-efficacy and performance, which can be used to help address some of the questions related to predicting performance (Judge & Bono, 2001). The self-efficacy beliefs of an individual are a good predictor of performance (Blomquist et al., 2016). Others agree by stating that self-efficacy is even more accurate when the task is challenging and has a higher level of difficulty (Locke, Frederick, Lee, & Bobko, 1984). Therefore, the measurement of self-efficacy in project management could offer an alternative approach to evaluating the competencies and skillsets of project managers, which may offer a more effective strategy than measuring actual competencies (Blomquist et al., 2016). However, implementing such a strategy to measure project management self-efficacy requires a valid scale, but a lack of a validated theory-based system demonstrates a clear gap in the literature (Blomquist et al., 2016). The literature does provide examples of taking into account the review of efficacy in project management practice and how it can provide an objective understanding of how to develop a baseline to measure improvement (Edmonds, 2010).

According to Bandura (1977), self-efficacy is a person's perception of his or her personal capability to accomplish a task or set of tasks and can influence a person's choice, degree of effort, and perseverance. Some authors state that project managers require a specific set of skills and self-efficacy about a project manager's confidence in performing jobs has enough theoretical

foundation to predict the behavior and the performance of a project manager (Blomquist et al., 2016). However, other authors argue that general self-efficacy scales are not accurate enough to measure performance as domain specific self-efficacy (Locke & Latham, 1990). Although a measure of general self-efficacy may be convenient to use, evidence does exist that general self-efficacy measurements to do not address specific domain and specific performance self-efficacy (Eden & Zuk, 1995; McGee, Peterson, Mueller, & Sequeira, 2009). Bandura (2012) added that the structure of self-efficacy fluctuates across tasks and contexts; therefore, self-efficacy beliefs cannot be utilized as a uniform and general trait that is applicable to every context and activity domain. This represents an opportunity to develop a domain specific project management self-efficacy measurement, which can assist in identifying patterns in the competencies and task demands of project management (Blomquist et al., 2016).

Unidimensional measures of self-efficacy include evaluating an individual's self-efficacy on general concepts but multi-dimensional self-efficacy measures several subset skills by taking into account different areas (Blomquist et al., 2016). According to Bandura (2012), domains that are more complex require operationalizing self-efficacy as a multi-dimensional concept. Project management can fall into this category of being complex by encompassing a wide range of activities, coordination of cost, time, and quality of work simultaneously (Atkinson, 1999). Furthermore, projects are embedded in the broader context of a project portfolio, strategies of an organization, and an even larger project environment (Dille & Soderlund, 2011). The conceptualization of project management as a multi-dimensional idea adds more theoretical value, and researching the effects of self-efficacy to include training would benefit from the ability to measure the effects on various dimensions of self-efficacy (Blomquist et al., 2016). Viewing project management as a multi-dimensional concept provides further support for the

need to research project management self-efficacy as a multi-dimensional concept (Svejvig & Anderson, 2015; Kerzner, 2013).

Application of Project Management Specific to Accreditation Processes

Research indicates there is evidence of project management being used in higher education for the purpose of accreditation processes according to Cann and Brumagim (2008). Some colleges are using project management techniques to create more efficient and effective methods of organizing accreditation efforts along with building improved communications frameworks to achieve accreditation goals (Cann & Brumagin, 2008). Other authors support the idea of using project management in accreditation processes such as in the preparation for engineering program accreditations (Badiru et al., 2010). Further evidence shows that project management has been used to manage processes related to accreditation self-studies at a college of pharmacy (Dominelli, Iwanowicz, Bailie, Clarke, & McGraw, 2007). More specifically, Microsoft Project ™ has been implemented in higher education accreditation processes and has demonstrated value as a project management tool to monitor the critical path and progress of projects (Crawford, Deis, & Parks, 2012).

Cann and Brumagim (2008) presented a case on how a business college incorporated project management tools to assist in the accreditation process of the Association to Advance Collegiate Schools of Business (AACSB). The goal of the article was to identify the use of project management tools, which facilitated the maintenance of an accreditation process as opposed to the initial accreditation (Cann & Brumagim, 2008). According to the authors, there were indications that project management effectively assisted the college with the work required to achieve successful maintenance of accreditation, created a communications framework during the review process, and helped team members gain a better understanding of the goals of

AACSB accreditation process (Cann & Brumagim, 2008). Other authors have noted the use of project management tools such as Microsoft Project™ during the process of AACSB accreditation (Crawford et al., 2012).

The use of project management has been used in the process of AACSB accreditation to address the common problem of inefficiency created by confusing processes and outcomes of the AACSB standards (Cann & Brumagim, 2008). The authors note that the issues in relation to AACSB accreditation are problematic but so are many other projects in higher education; the authors suggest that the implementation of project management can increase efficiency and effectiveness of many processes (Cann & Brumagim, 2008). Others agree in that project management can improve time management and create improved project timelines, which minimizes potentially negative impacts (Dominelli et al., 2007). Cann and Brumagim (2008) also indicated that creation of project work breakdown structures played a role in building a model for sustainability in the maintenance of the accreditation effort. The work breakdown structures provided a method for documenting and defining, along with identifying those who were responsible to carry out specific processes within the full scope of the accreditation event (Cann & Brumagim, 2008).

Challenges to Implementing Project Management in Higher Education

Integrating project management in higher education is not without some challenges. Emelander (2014) pointed out that organizational structure and poor institutional support is one of the greatest challenges to implementing project management in government organizations. There are additional constraints resulting from government bureaucracy including procurement and government regulations (Emelander, 2014). Further research indicates that there are challenges related to how faculty and staff in higher education institutions perceive project

management (Austin et al., 2013). These constraints are further expanded by the fact that the linear nature of project management often conflicts with the abstract and analytical nature of academia (Austin et al., 2013). Emelander (2014) also stated that government-hiring procedures may often challenge the development of strong teams. Strong project teams require a variety of specialists made up of different subject matter experts; however, common government matrix style of management may result in loyalty dilemmas, barriers to change, and ultimately weaker team performance (Emelander, 2014).

The value of project management and how to adequately access the value is another challenge that raises questions (Thomas & Mullaly, 2007). The issue that arises from determining value is in relation to the depth and breadth of the instruments and variables used to evaluate all the aspects of project management within an organization (Thomas & Mullaly, 2007). The work of Crawford and Helm (2009) expanded upon the work of Thomas and Mullaly (2007) by examining the value expectations and realizations of investing in project management within a public sector setting. There are also individual factors that may determine the value of project management that include a person's past experience with projects, educational background, levels of motivation, and the quality of previous project management training (McCreery, 2003). A later article from Mullaly and Thomas (2009) followed up the idea of measuring the value of project management within an organization by recommending exploring the sustainability of project management along with considering how its capabilities will differ in value at one stage of the organization, while delivering a different value in another stage. Dowling and Turner (2010) pointed out that determining the success and acceptance of project management implementation can prove to be challenging with varying perceptions of administrators, making understanding value even more difficult.

Critics of project management integration in higher education argue that higher education is not in need of improved management techniques, but rather a need for better managers (Birnbaum, 2001). There is also the concern that transitioning from individual project management to a more encompassing project management system is under-investigated (Kalimullin, Youngblood, & Khodyreva, 2016). In addition, the confines of the requirements of project management standards outlined by the International Project Management Association may invoke some restrictions on implementation (Kalimullin et al., 2016). Burgher and Snyder (2012a) added that those in higher education are often resistant to change and do not always know how to convert a viable plan into one that is actionable, closable, and workable.

Maccari (2002) wrote that higher education has a distinct level of complexity, which includes a problematic relationship between academic power and the bureaucratic power present. This is explained by the fact that educators are focused on specific instructional objectives, and the administration is focused on non-specific functions such as activities related to resource allocation, management, and other tasks pertinent to the continuity of the organization (Maccari, 2002). Other authors agree that project management in higher education will require improvements to the methodology and management processes within the functional areas of higher education (Kalimullin et al., 2016). The introduction of standards, procedures, templates, and consistent methodology related to project management techniques could address the issues of improvements within the functional areas (Kalimullin et al., 2016). This complexity is compounded by the fact that there is often a divide between faculty and staff in higher education that is evident by differing priorities between departments and a lack of shared governance (Austin et al., 2013). Furthermore, Dowling and Turner (2010) added that some project life

cycles associated with higher education are not always straightforward, which can create problems in relation to the implementation of project management.

Burgher and Snyder (2012a) contended that higher education is well equipped with good thinkers, developers, and planners of ideas; however, the execution of those ideas is often the limitation. It is noted that higher education is often reluctant to change and struggles with the ability to convert a good idea into an actionable idea (Burgher & Snyder, 2012a). The skillsets of leaders in higher education are general more on a micro level as opposed to macro level skillsets of the traditional project manager (Austin et al., 2013). Other authors agree by stating that members of higher education are not typically conversant with project management techniques, tools, and processes (Badiru et al., 2010). This requires higher education administrators to become more knowledgeable in varying areas in order to comply with project management techniques (Austin et al., 2013). Zhang and Bishop (2005) add that considerable lead time should be factored in to allow those implementing project management techniques and tools to master any learning curves that may exist.

This literature review attempted to demonstrate some of the most relevant aspects of project management in higher education. Utilizing the literature contained in this review will help fortify a continued study to determine if the environment of higher education is favorable for project management. Additional research and comparisons of project management in construction and healthcare may help determine how project management may be effective in higher education (Austin et al., 2013).

Transition and Summary

This section of research study laid the foundation for investigating project management implementation in higher education by evaluating project management self-efficacy, confidence

in the ability to apply project management, and project work experience. The study is based upon Bandura's (1977) theory of self-efficacy and how experience may affect faculty/staff venturing into applying project management techniques. The significance of the study will contribute to addressing the gaps in the literature pertaining to why project work in higher education is viewed differently than other industries experiences similar issues. The study demonstrated the implications of self-efficacy and industry experience along with how organizational change factors in the application of project management techniques. The expected results of the study provided a positive change in the organizational climate of higher education by demonstrating the value of project management in addressing a variety of processes within a higher education setting.

Section 2 of this study includes the research method and design along with the data analysis. The researcher exposed one group of faculty/staff to a project management training seminar and a second group was not exposed to a project management training seminar. The researcher used t-tests to determine the difference between the two groups. The study assessed research question two by comparing the pre-training confidence in the ability to apply project management knowledge to the post-training confidence in the ability to apply project management knowledge. The increase between the pre-training levels and post-training levels addressed the research question. For the third and fourth research question, the research of McCreery (2003) was used to develop a tool to assess the level of project management knowledge and designed with a seven point Likert scale to assess self-efficacy levels. To assess the levels of project work experience, the faculty/staff are ranked lowest to highest in reference to project work experience in years. The fifth research question addressed the level of improvement in self-efficacy between lower level and higher level project work experience

faculty/staff. Research question six utilized this same process, but tests the means of the level of improvement between lower level project work experience and higher level project work experience among faculty/staff in relation to the confidence in the ability to apply project management.

Section 2: The Project

The researcher conducted this study to determine if project management self-efficacy of faculty/staff and industry experience contributes to the lack of project management in higher education. The research addressed the relationship between faculty/staff self-efficacy and project management training along with exploring the role of previous project work experience. The work of McCreery (2003) was expanded to test the project management training within higher education. A quantitative case study method is most effective in this study since it will utilize t-tests to evaluate the self-efficacy of faculty/staff to determine if project management training is relative to project management implementation in higher education.

The research design of the study was based upon experimental research, which attempts to determine if a specific treatment of a group factors into an outcome (Creswell, 2009). A group of faculty/staff participated in a pre-test Likert scale instrument and then exposed to a project management training seminar followed by a post-test Likert scale instrument. A t-test was used to determine if there is a statistical difference between the mean. Participants were asked to complete the project management training within a given time period and respond to the Likert scale instrument within a specific timeframe of completing the training. A questionnaire instrument, which was available through SurveyMonkey.com, evaluated the project work experience of the participants.

Purpose Statement

The purpose of this quantitative study was to examine the relationship between project management training and the faculty/staff self-efficacy towards the implementation of project management techniques within higher education. Higher education often views project management as not having value outside of construction related industries and considers the

process to be too rigid for application within education (Austin et al., 2013). The work of Burgher and Snyder (2012a) was expanded to determine how project management methods work in traditional settings, such as the construction industry, and to apply project management techniques to higher education. Previous work by Chiocchio et al. (2015), which explored project management self-efficacy and project management training, was also expanded in the study. In addition, the study identified gaps in research related to project management implementation in higher education noted by other authors (Austin et al., 2013). The study investigated effects that project management training can have on project management self-efficacy along with the role previous project work can play in the implementation of project management in higher education.

Role of the Researcher

The role of the researcher encompassed all aspects of the research including the design of research and the protection of the participants involved in the study. The researcher collected data from a population using a survey method, develop an instrument to analyze the data, and establish a method of reliability and validity for the data. The researcher evaluated any risk that may affect the participants and continued to monitor the research process throughout the study. Other roles included utilizing competent statistical and analytical processes in the collection of all data. The researcher was expected to comply with all ethical standards and produce research that provides a benefit to the participants. There is also a responsibility to adhere to all IRB guidelines, which includes following protocol of any revisions, amendments, or changes that may occur during the study. The researcher was expected to maintain proper records and data for a predetermined period based upon the requirements of the IRB.

Participants

The participants of the study included faculty and staff of a two-year technical college located in Georgia. The research concentrated on faculty/staff in a higher education setting, specifically in a two-year technical college. The research included both male and female between the ages of 21 and 65 years old, with diverse ethical backgrounds, and employed in either part-time faculty, full-time faculty, part-time staff or full-time staff positions. In addition, the participants were identified as having previous project work experience and as not having previous project work experience. The researcher provided each participant of the study with ethical protection based upon the guidelines set forth by the internal review board standards. The measures taken to adhere to such guidelines included collecting aggregate data and disclosing no personal information.

Research Method and Design

The nature of the study was quantitative and constructed in an experimental research design. A two-year technical college was the focus of the study. The two-year technical college chosen has approximately 500 faculty/staff members. The research design of the study was based upon experimental research, which attempts to determine if a specific treatment of a group factors into an outcome (Creswell, 2009).

Method

The research method utilized in the study was quantitative. The quantitative method of research considers the relationship between a dependent variable and an independent variable, which are then measured with instruments so that statistical analysis can be performed (Creswell, 2009). A quantitative case study method was most effective in this study since it utilized data, which was collected from pre-tests and post-tests. A quantitative method was best suited since

the data collected from the pre-tests and post-tests produced mean scores and then required comparing the means to arrive at a statistical conclusion. T-tests were used to evaluate the self-efficacy of faculty/staff towards project management and the confidence in the ability to apply project management through project management training. A quantitative study was chosen instead of a qualitative study because this study analyzed numerical data related to rates of the confidence in the ability to apply project management and project work experience. The variables utilized within the t-test and test instruments were analyzed using statistical methods and statistical analysis (Creswell, 2008). Quantitative research commonly involves data collection methods such as surveys, experiments, and questionnaires, along with other forms of numerical data (Creswell, 2014).

The qualitative method was not selected because it relies upon open-ended questions as opposed to quantitative instrument based questions (Creswell, 2008). A quantitative research method gathers information in an objective manner as opposed to a qualitative method in which information is gathered using a more subjective approach (Stake, 2010). A mixed method research method combines both quantitative and qualitative research methods, which requires the researcher to use data from both methods to approach the problem (Creswell, 2014). A mixed method was not used in this study since a qualitative method was not applicable.

Research Design

The research design of the study was based upon experimental research, which attempts to determine if a specific treatment influences an outcome or the dependent variable (Creswell, 2009). An experiment was best suited for this study since there was an attempt to establish a possible cause and effect between the independent variable and dependent variable (Creswell, 2009). The experiment was provided as a particular treatment to a group of individuals

(Creswell, 2009). To test the first two research questions, the study exposed a group of faculty/staff to a project management training seminar. However, prior to the project management training, the group completed a pre-training instrument using a Likert scale and the same Likert scale instrument was distributed after the project management training. T-tests were used to determine the difference between the means. The Likert scales used were based upon the research conducted by McCreery (2003). The Likert scale instrument addressed research question one and research question two by prompting the participant to respond to the items in "level of self-efficacy improved" and "confidence in the ability to apply project management" in the specific areas defined within the Likert scale. The study assessed both research questions one and two by comparing the pre-training to the post-training results. The study assessed research question one by comparing the pre-training self-efficacy to the post-training self-efficacy of project management. The researcher assessed research question two by comparing the pre-training confidence in the ability to apply project management knowledge to the post-training confidence in the ability to apply project management knowledge. For the third and fourth research questions, the pre-training instrument included a question used to collect data referencing the participant's previous project work experience. The researcher evaluated the participants according to his or her project work experience by assessing their project work experience within a range of years. The participants chose between seven different year ranges of project work experience. The study ranked the participants into two groups based upon project work experience. Group one consisted of those with less than five years' experience (Likert scale of 1-4) and group two consisted of those with more than five years' experience (Likert scale of 5-7). The study assessed those in group one as having low project work experience while participants in group two were assessed as having high levels of project work

experience. The researcher computed the mean values of both pre-training survey questions for the lower level and higher level project work experience. In addition, the researcher computed the mean values of both post-training questions for the lower level and higher level project work experience. A t-test was used to compute the p-value of the lower level project work experience group's pre-training and post-training results for both the level of self-efficacy and the confidence in the ability to apply knowledge. The study used the same testing procedure to compute the p-value for the higher level project work experience group. Determining previous project work experience links to the hypothesis that prior experience may affect project management self-efficacy. The fifth research question addressed the level of improvement in self-efficacy among lower level and higher level project work experience faculty/staff. The study used a two-sample t-test with unequal variances to determine whether the means of the level of improvement differ between lower level project work experience and higher level project work experience faculty/staff in relation to self-efficacy. Research question six utilized this same process but tests the means of level of improvement between lower level project work experience and higher level project work experience faculty/staff in relation to the confidence in the ability to apply project management.

Population and Sampling

The quantitative study included participation from full-time faculty, part-time faculty, full-time staff and part-time staff from a two-year technical college. The term "faculty/staff" includes all of the participants previously mentioned. The population includes those faculty/staff with associate's degrees, bachelor's degrees, master's degrees, doctoral degrees and industry certifications. The number of full-time faculty was 111 and the total number of full-time staff was 156. There were 158 part-time faculty and 94 part-time staff. The total population size was

519. All of the participants were accessible through internal email or face-to-face contact. This sample of the population was the most effective and efficient to study due to convenience sampling. This was further supported by inferential statistics since the college faculty/staff utilized in the study represent a much larger group of faculty/staff within the entire Technical College System of Georgia (TCSG).

The sampling design for the study was single stage since there was direct access to the population. The selection process of the sample was based upon a random selection process, which supports an equal opportunity for individuals to be selected (Creswell, 2009). Randomization of the sample provides the opportunity to generalize the population (Creswell, 2009). The sample design did not involve stratification in relation to gender, race or any other specific characteristics.

The procedure for selecting the sample from the population of faculty/staff included the use of an online sample size calculator which is designed for before-after (paired T-test) studies. The sample size tool is located at http://www.sample-size.net/sample-size-study-paired-t-test/. According to the sample size calculator, the sample size of this research is 31 participants. This includes a 5% Type I error rate, a 0.2 Type II error rate, and a standard deviation of 1 (see Appendix A). According to Salkind (2013), samples should represent the population as closely as possible in order to ensure a higher degree of generalizability.

Data Collection

Instruments

The research contained a pre-training instrument, post-training instrument and an experimental treatment, which is the project management training. The researcher provided the participants a brief question in the pre-training instrument was provided to the participants to

gather information concerning previous project work experience (see Appendix B). Prior to the experimental treatment, the researcher provided all the participants within the sample a pre-training instrument. The study used pre-training instruments to assess the level of self-efficacy and confidence in the ability to apply project management techniques within a higher education setting (see Appendix C). A Likert scale of 1 to 7 is used, with 1 being extremely low and 7 being extremely high. The Likert scales used were based upon the research conducted by McCreery (2003). The Likert scale instrument addressed research question one and research question two by prompting the participant to respond to the items in "level of self-efficacy improved" and "confidence in the ability to apply project management" in the specific areas defined within the Likert scale. The "level of self-efficacy improved" prompted questions in the pre-training instruments and post-training instruments evaluated the relationship between project management training and self-efficacy of faculty/staff. The "confidence in the ability to apply project management" prompted questions in the pre-test and post-test will evaluate the relationship between project management training and the ability for faculty/staff to apply project management knowledge. Both research questions one and two were assessed by comparing the pre-training to the post-training results and comparing the means. The pre-training instrument administered prior to the project management training was identical to the post-training instrument with the exception that prior project work experience was not addressed in the post-training instrument.

Following the pre-training instrument, the project management training was conducted with the group (see Appendix D). The project management training consisted of a basic project management course created by the researcher and link to the research questions. The project management course was comprised of information concerning basic project management

concepts, which included the following: project life cycle, project planning, assessing risks, scope, project activities, time estimation, budgeting, allocating resources and performance measures. The project management course also contained examples of project management, chart examples, and figures to demonstrate basic project management. Upon completion, a post-training instrument that was identical to the pre-training instrument, with the exception of prior project work experience, was distributed to all participants (see Appendix E). After the completion of the pre-training instrument, experimental treatment, and post-training instrument, the mean scores were evaluated to determine any statistical significance.

The pre-training instrument contained a question related to previous project work experience. This information was used in conjunction with the project management training and was used to address how previous project work experience may affect the impact of project management training. The question included the number of years that previous project work has been performed. The researcher used the information collected to address the relationship between project work experience and project management training. The work of McCreery (2003) and project work experience was expanded to relate to this study.

The raw data from the pre-training instrument and post-training instrument are available in a table format within the appendix of the study. The validity of the pre-training instrument and post-training instruments was supported by the peer reviewed work of McCreery (2003). The Likert scales used in the study by McCreery (2003) have been revised to ensure more accuracy and adaptability to a higher education setting.

Data Collection Technique

The researcher sent out an email invitation to the population requesting participation in the research (see appendix F). The email also contained information related to the

confidentiality of the results, data, and an informed consent for participation (see Appendix G). Additionally, the email contained information related to the nature of the research being conducted and instructions on the completion of the survey. Participants that elected to participate in the research, first completed a pre-training instrument electronically through SurveyMonkey.com. Participants were then asked to complete a Likert scale pre-training survey. The participants then completed a basic project management course followed by a Likert scale post-training, which was also provided through SurveyMonkey.com. The estimated time to complete the pre-training instrument and post-training instruments, and the basic project management course was 1 ½ hours. The email invitation, consent forms and instructions for participants required 10 minutes. The pre-training instrument and post-training instruments required approximately 20 minutes to complete. The basic project management course required approximately 60 minutes to complete.

None of the questions in the pre-training instrument and post-training instruments inquired about information that may be held liable for identification (i.e., names, addresses, phone numbers, email, social security numbers, or DOB, etc.). The researcher published the results of the survey as group results only. The results did not include the names and identity of the participants in the research. The researcher had the only access to the collected data. The results of the pre-training instruments and post-training instruments were gathered through SurveyMonkey.com.

Data Organization Techniques

The researcher will secure the information gathered in a locked area for a minimum of three years. Access to the data will be limited to the researcher. After three years, the researcher will destroy the data. The privacy policy established by SurveyMonkey.com will safeguard the

data collected electronically. A private USB drive will store the research data and will be secured by the researcher in accordance with the research standards.

Data Analysis Technique

The researcher used IBM SPSS predictive analytics software version 25 for Windows to analyze and code the data collected from the pre-training instrument and post-training instrument. The data for the previous project work experience question were obtained by using a Likert scale (1=No project work experience to 7=Extensive project work experience). The results of the pre-training instrument identified those participants with low levels of project work experience and those participants with high levels of project work experience. The participants that responded with a 1 to 4 were considered to have low project work experience, and the participants that responded with a 5 to 7 were considered to have high project work experience. The data collected from the previous project work experience question provided information associated with the research question concerning how previous project work experience impacts project management training.

The pre-training instrument and post-training instrument also used a Likert scale (1=Extremely low to 7=Extremely high). The results of the pre-training instrument and post-training instrument identified those participants with lower levels of knowledge and those with high levels of knowledge in relation to project management. The pre-training instrument and post-training instrument also identified those participants with lower levels of self-efficacy and higher levels of self-efficacy. The data collected from the pre-training instrument and post-training instrument addressed the research questions concerning self-efficacy and the confidence in the ability to apply project management knowledge. The data collected also addressed the hypotheses associated with each research question by determining if there was any significant

statistical difference between self-efficacy and project management training, significant statistical difference between applying knowledge after receiving project management training, and significant statistical difference project work experience and improvement in project management self-efficacy.

Reliability and Validity

Reliability

Reliability pertains to ensuring that the instruments used in the research produce data, which is consistent, and stable (Creswell, 2008). Examining the reliability of a research instrument requires measuring the instrument's ability to establish internal consistency and its reliability over time (Creswell, 2014). The internal consistency ensures that the items on an instrument are consistent with one another by representing one, and only one, dimension (Salkind, 2013). In order for academic studies to be useful, they must also be reliable. Therefore, the measure of reliability within a quantitative study requires the ability to reproduce consistent testing results by the researcher (Creswell, 2014; Spencer, Ritchie, Lewis, & Dillion, 2003).

This dissertation research study was quantitative in nature and relied upon data collected through a pre-training instrument and a post-instrument. The pre-training instrument and post-training instrument used in the data collection were tested for reliability and consistency by computing the Cronbach's Alpha (α). The Cronbach's Alpha (α) correlates the score of each survey item with the overall total score of each individual and comparing it to the variability of each individual item score (Salkind, 2013).

Validity

The validity of research demonstrates the accuracy of the information collected (Mutsonziwa & Serumaga-Zake, 2015). According to Creswell (2014), the common threats to validity include both internal and external sources. Internal sources include such events as researchers incorrectly drawing conclusions in regards to treatment efficacy, and external sources could include improper application of statistical information (Creswell, 2014). Both internal and external threats to validity were explored in relation to this research study.

Internal validity. This study utilized an experimental treatment, project management training, which can present internal threats to validity such as incorrectly drawing conclusions about the population. A specific internal threat to this study included selection, which can predispose the participants with certain characteristics to produce a certain outcome. This threat can be addressed by selecting participants randomly so that the probability of equaling selecting individuals with a variety of characteristics is increased (Creswell, 2009). A second internal threat to this study was mortality. This internal threat relates to participants who may drop out of the project management training for a variety of reasons resulting in unknown outcomes. Mortality rates can be reduced by selecting a larger sample to account for participants that may drop out of the project management training (Creswell, 2009). The internal threat of instrumentation for this study was minimal since the pre-test and post-test are the same.

External validity. External validity threats often arise when the researcher draws incorrect and inaccurate conclusions from the sample data (Creswell, 2009). One external validity threat is the interaction of selection and treatment, which involves the inability to generalize the participants in the experiment (Creswell, 2008). This external threat can be resolved by increasing the convenience of the experiment for the participants (Creswell, 2008).

A second external threat to the study involves interaction of history and treatment (Creswell, 2009). A solution to this external threat is to replicate the experiment at a different time in order to determine if the same results occur as previous times (Creswell, 2009).

Transition and Summary

This section of the study reviewed the role of the researcher, participant overview, research method and design, population and sampling, data collection and techniques, and reliability and validity. This section provided information necessary to identify the participants in the study, conduct the experiment, gather data from the sample, and compile the data in a useful manner. All of the elements in the section were necessary to determine a correlation between project management training self-efficacy, the confidence in the ability to apply project management knowledge, and the impact of previous project work experience.

The next section reviewed the results for presenting the findings of the study, applying the results for professional practice, and recommendations for further actions and study. The results presented in this section were determined by the data analysis collected in the previous section.

Section 3: Application to Professional Practice and Implications for Change

Section 3 of this study presents the findings of the research, defines the application to professional practice, recommends actions, provides recommendations for further study and reflects on the researcher's experience. The findings of the research result from data collected in the form of pre-test and post-test information that address the research questions and attempt to close the gaps in the literature. The application of the findings is intended to improve project management practices within a higher education setting as well as provide additional opportunities for future research. This section addresses the researcher's experiences throughout the research process while providing biblical principles that align with the study.

Overview of Study

As the level of competition and speed at which institutes of higher education are forced to operate increases, there are demands to initiate a number of projects concurrently in order to remain competitive (Burgher & Snyder, 2012a). This presents a problem for many higher education institutions in that there is insufficient time and resources to complete these projects, along with a lack of priority determining methods to accomplish the projects (Burgher & Snyder, 2012a). Implementing the concepts of project management could assist in responding to the issues facing higher education by initiating the project, planning the work of the project, controlling the tasks, and providing a system for project closure (Clark, 2008). One researcher notes that self-efficacy could play a role in assisting individuals to adopt new techniques and perform tasks more effectively (Lucas et al., 2009). Considering these issues related to higher education, an opportunity exists to determine if higher education can benefit from the implementation of project management (Austin et al., 2013).

The use of project management is widely known within a variety of industries such as construction and manufacturing; however, project management tools are not commonly applied to academic programs (Badiru et al., 2010). Research suggests that one challenge to implementing project management is a lack of project work experience and the fact that studies related to project management efficacy are rare (Chiocchio et al., 2015). The work of McCreery (2003) draws a correlation between project work experience and one's confidence in applying project management. The McCreery (2003) study found that those with less project work experience demonstrate a higher level of self-efficacy in applying project management skills after receiving training than those with higher levels of project work experience. This study furthers the research of McCreery (2003) by testing the self-efficacy of faculty/staff before and after project management training.

Presentation of the Findings

The purpose of this quantitative, inferential study was to examine the relationship between project management training and faculty/staff self-efficacy and confidence in the ability to apply project management knowledge. A similar prior study has found that participants demonstrate a statistically significant increase in levels of knowledge and confidence in the ability to apply project management after receiving project management training (McCreery, 2003). Although the study of McCreery (2003) was conducted in an academic classroom setting, the assessments used provided the foundation of the analysis for this study. The assessments in this study include the areas of levels of project management self-efficacy, confidence in the ability to apply project management and project work experience. This study uses the assessments of McCreery (2003) and applies data gathered from 37 faculty/staff participants

from Southern Crescent Technical College located in Griffin, GA using paired sample t-tests. All statistical tests and analyses were conducted using IBM SPSS version 25.

The research questions and hypotheses for the study were as follows:

Questions:

Q1. Would project management training improve self-efficacy for tasks among faculty/staff?

Q2. Would project management training increase the confidence in the ability of faculty/staff in applying project management knowledge?

Q3. Would the project management training have significant impact on faculty/staff with lower level project work experience?

Q4. Would the project management training have significant impact on faculty/staff with higher level project work experience?

Q5. Is the level of improvement in self-efficacy the same for lower level and higher level project work experience faculty/staff after the project management training?

Q6. Is the level of improvement in the confidence in the ability to apply project management knowledge the same for lower level and higher level project work experience faculty/staff after the project management training?

Hypotheses for Q1:

$H_0 1$: $\mu_{post} = \mu_{pre}$ Where μ_{post} is the mean of post-training survey score and μ_{pre} is the mean of pre-training survey score.

There is no significant improvement in self-efficacy among faculty/staff after project management training.

$H_1 1$: $\mu_{post} > \mu_{pre}$

There is a significant improvement in self-efficacy among faculty/staff after project management training.

Hypotheses for Q2:

$H_0 2$: $\mu_{post} = \mu_{pre}$

Faculty/staff's confidence in the ability to applying project management knowledge does not increase significantly after the project management training.

$H_1 2$: $\mu_{post} > \mu_{pre}$

Faculty/staff's confidence in the ability to applying project management knowledge does increase significantly after the project management training.

Hypotheses for Q3:

$H_0 3a$: $\mu_{post} = \mu_{pre}$

There is no significant improvement in project management self-efficacy after the completion of project management training for those with lower level project work experience.

$H_1 3a$: $\mu_{post} > \mu_{pre}$

There is significant improvement in project management self-efficacy after the completion of project management training for those with lower level project work experience.

$H_0 3b$: $\mu_{post} = \mu_{pre}$

There is no significant improvement in the confidence in the ability to apply project management after the completion of project management training for those with lower level project work experience.

$H_1 3b$: $\mu_{post} > \mu_{pre}$

There is a significant improvement in the confidence in the ability to apply project management after the completion of project management training for those with lower level project work experience.

Hypotheses for Q4:

$H_0$4a: $\mu_{post} = \mu_{pre}$

There is no significant improvement in project management self-efficacy after the completion of project management training for those with higher level project work experience.

$H_1$4a: $\mu_{post} > \mu_{pre}$

There is significant improvement in project management self-efficacy after the completion of project management training for those with higher level project work experience.

$H_0$4b: $\mu_{post} = \mu_{pre}$

There is no significant improvement in the confidence in the ability to apply project management after the completion of project management training for those with higher level project work experience.

$H_1$4b: $\mu_{post} > \mu_{pre}$

There is a significant improvement in the confidence in the ability to apply project management self-efficacy after the completion of project management training for those with higher level project work experience.

Hypotheses for Q5:

$H_0$5: $\mu_{DL} = \mu_{DH}$

The level of improvement in self-efficacy among faculty/staff with lower level project work experience is the same as those with higher level project work experience after project management training.

$H_1 5$: $\mu_{DL} > \mu_{DH}$

The level of improvement in self-efficacy among faculty/staff with lower level project work experience is higher than those with higher level project work experience after project management training.

Hypotheses for Q6:

$H_0 6$: $\mu_{DL} = \mu_{DH}$

The level of improvement in the confidence in the ability to apply project management knowledge among faculty/staff with lower level project work experience is the same as those with higher level project work experience after project management training.

$H_1 6$: $\mu_{DL} > \mu_{DH}$

The level of improvement in the confidence in the ability to apply project management knowledge among faculty/staff with lower level project work experience is higher than those with higher level project work experience after project management training.

The data in Table 1 is specific to each question contained in the pre-training and post-training surveys. The information in Table 1 provides the mean values in self-efficacy and the confidence in the ability to apply knowledge in the 10 areas included in the surveys. Inspection of the data reveals that average level of self-efficacy and average level of the confidence in the ability to apply knowledge increased after the training for all 10 areas.

Table 1

Pre- and Post- Training Results: Level of Self-efficacy and Confidence in the Ability to Apply Knowledge

Question		Level of self-efficacy			Ability to apply knowledge		
		Pre-	Post-	Post-Pre	Pre-	Post-	Post-Pre
1	Project life cycle	4.34	5.51	1.17	4.68	5.32	0.64
2	Project planning	4.91	5.56	0.65	4.78	5.41	0.63
3	Assessing project risks	4.32	5.38	1.06	4.11	4.94	0.83
4	Establishing project scope	4.54	5.24	0.70	4.24	5.22	0.98
5	Sequencing project activity	4.89	5.49	0.60	4.78	5.27	0.49
6	Estimating project times	4.69	5.35	0.66	4.54	5.05	0.51
7	Project budgeting	4.43	5.11	0.68	4.17	4.81	0.64
8	Allocating project resource	4.57	5.32	0.75	4.38	5.24	0.86
9	Performance measures	4.14	5.14	1.00	4.24	4.97	0.73
10	Overall confidence	4.65	5.46	0.81	4.62	5.32	0.70
	Mean	4.55	5.36	0.81	4.45	5.16	0.71

The first research question tested the self-efficacy of faculty/staff in project management knowledge. The researcher conducted a paired sample t-test to compare the pre-training survey results and the post-training survey results of determining the participant's project management self-efficacy shown in Table 2.

Table 2

Results of t-test for Pre-training and Post-training Project Management Self-efficacy

	Pre-Training		Post-Training			95% CI for Mean Difference			
Outcome	M	SD	M	SD	n		Sig.	t	df
	4.55	.25	5.36	.16	10	.95, .67	.000	12.90	9

Note. Where M: mean; SD: standard deviation; n: number of observations; Sig: p value, t: t value, df: degree of freedom.

With the significant level $\alpha = 0.05$, since t-value = 12.90 and p = .000, the null hypothesis was rejected and we concluded that there was a significant increase in the faculty/staff self-efficacy in project management knowledge as a result of project management training.

The second research question tested the ability of faculty/staff in applying project management after receiving project management training. The researcher conducted a paired sample t-test to compare the pre-training survey results and the post-training survey results of determining the participant's confidence in their ability to apply project management knowledge shown in Table 3.

Table 3

Results of t-test for Pre-training and Post-training Confidence in the Confidence in the Ability to Apply Project Management

	Pre-Training		Post-Training			95% CI for Mean Difference			
Outcome	M	SD	M	SD	n		Sig.	t	df
	4.45	.26	5.16	.20	10	.81, .59	.000	14.37	9

With the significant level $\alpha = 0.05$, since t-value = 14.37 and $p = .000$, the null hypothesis was rejected and we concluded there was a significant increase in the faculty/staff confidence in their ability to apply project management knowledge as a result of project management training.

The third research question tested the relationship between lower level project work experience and the level of improvement in both project management self-efficacy and the confidence in their ability to apply project management. Nine participants were included in the lower level project work experience group. The researcher conducted paired t-tests to compare the lower level experience pre-training survey results and post-training survey results. The research question was addressed with two hypotheses, which included the level of self-efficacy improvement among lower project work experience participants and the level of improvement in the confidence in their ability to apply project management among lower level project work experience. Table 4 compares the lower level project work experience self-efficacy pre-training mean and post-training mean.

Table 4

Results of t-test for Pre-training and Post-training Project Management Self-efficacy for Lower Level Faculty/Staff

	Pre-Training		Post-Training			95% CI for Mean Difference			
Outcome	M	SD	M	SD	n		Sig.	t	df
	2.69	.36	5.67	.22	10	3.23, 2.73	.000	27.03	9

With the significant level $\alpha = 0.05$, since t-value = 27.03 and $p = .000$, the null hypothesis was rejected and we concluded there was a significant increase in improvement of self-efficacy in project management for faculty/staff with lower levels of project work experience as a result of project management training.

Table 5 provides data for comparing the pre-training mean for the confidence in the ability to apply project management and the post-training mean for the confidence in the ability to apply project management among lower level project work experience participants.

Table 5

Results of t-test for Pre-training and Post-training Project Management Confidence in the Ability for Lower Level Faculty/Staff

	Pre-Training		Post-Training			95% CI for Mean Difference			
Outcome	M	SD	M	SD	n		Sig.	t	df
	2.71	.35	5.47	.30	10	2.95, 2.56	.000	32.45	9

With the significant level $\alpha = 0.05$, since t-value = 32.45 and $p = .000$, the null hypothesis was rejected and we concluded there was a significant increase in the confidence in the ability to apply project management knowledge for faculty/staff with lower level project work experience as a result of project management training.

The fourth research question tested the relationship between higher level project work experience and the level of improvement in both project management self-efficacy and the confidence in the ability to apply project management. Twenty-eight participants were included in the higher level project work experience group. The researcher conducted paired t-tests to compare the higher level experience pre-training survey results and post-training survey results. The research question is addressed with two hypotheses. The first hypothesis tested the level of self-efficacy improvement among higher level project work experience participants. The second hypothesis tested the level of improvement in the confidence in the ability to apply project management among higher level project work experience. Table 6 compares the higher level project work experience pre-training self-efficacy mean and higher level project work experience post-training self-efficacy mean.

Table 6

Results of t-test for Pre-training and Post-training Project Management Self-efficacy for Higher Level Faculty/Staff

	Pre-Training		Post-Training			95% CI for Mean Difference			
Outcome	M	SD	M	SD	n		Sig.	t	df
	5.15	.25	5.19	.17	10	.21, .12	.269	.640	9

With the significant level $\alpha = 0.05$, since t-value = .640 and p = .269, the null hypothesis was not rejected and we concluded there was no significant improvement of self-efficacy in project management for faculty/staff with higher level project work experience as a result of project management training.

Table 7 provides data for comparing the pre-training mean for the confidence in the ability to apply project management and the post-training mean for the confidence in the ability to apply project management among higher level project work experience participants.

Table 7

Results of t-test for Pre-training and Post-training Project Management Confidence in the Ability for Higher Level Faculty/Staff

	Pre-Training		Post-Training			95% CI for Mean Difference			
Outcome	M	SD	M	SD	n		Sig.	t	df
	5.02	.24	5.08	.18	10	.23, .10	.198	.892	9

With the significant level $\alpha = 0.05$, since t-value = .892 and p = .198, the null hypothesis was not rejected and we concluded there was no significant increase in the confidence in the ability to apply project management knowledge for faculty/staff with higher level project work experience as a result of project management training.

Table 8 includes information for determining if the level of improvement in self-efficacy is the same for lower level project work experience faculty/staff and higher level project work experience faculty/staff after project management training. DL equals the post-survey minus the pre-survey for the lower level project work experience faculty/staff. DH equals the post-survey minus the pre-survey for the higher level project work experience faculty/staff. The researcher used a two-sample t-test with unequal variances to determine whether the means of the level of improvement differ between lower level project work experience and higher level project work experience faculty/staff in relation to self-efficacy.

Table 8

Results of t-test for Pre-training and Post-training Project Management Self-efficacy for Lower Level and Higher Level Faculty/Staff

	DL		DH				
Outcome	M	V	M	V	Sig.	t	df
	2.98	0.12	0.05	0.05	0.00	22.28	15

Note. Where V: variance.

With the significant level $\alpha = 0.05$, since t-value = 22.28 and $p = 0.00$, the null hypothesis was rejected and we concluded the level of improvement in self-efficacy for the lower level project work experience faculty/staff after the project management training is significantly higher than that for the higher level work experience faculty/staff.

Table 9 provides data for determining if the level of improvement in the confidence in the ability to apply project management is the same for lower level work experience faculty/staff and higher level project work experience faculty/staff after project management training. DL equals the post-survey minus the pre-survey for the lower level work experience faculty/staff. DH equals the post-survey minus the pre-survey for the higher level project work experience faculty/staff. The researcher used a two-sample t-test with unequal variances to determine whether the means of the level of improvement differ between lower level work experience and higher level project work experience faculty/staff in relation to the confidence in the ability to apply.

Table 9

Results of t-test for Pre-training and Post-training Project Management Confidence in the Ability to Apply for Lower Level and Higher Level Faculty/Staff

	DL		DH				
Outcome	M	V	M	V	Sig.	t	df
	2.76	0.07	0.07	0.05	0.00	24.06	18

With the significant level $\alpha = 0.05$, since t-value = 24.06 and $p = 0.00$, the null hypothesis was rejected and we concluded the level of improvement in the confidence in the ability to apply project management for the lower level project work experience faculty/staff after the project management training is significantly higher than that for the higher level project work experience faculty/staff.

Applications to Professional Practice

This research study has provided additional information to fill the knowledge gap between project management self-efficacy and the confidence in the ability to apply project management skills in higher education. The study has addressed the lack of project management application in higher education along with the awareness of how project management training leads to increase self-efficacy. The results of the study assisted in providing the missing link between the application of project management techniques and how faculty and staff view project management that is employed in higher education. The professional practices in higher education are advanced through this research by offering the opportunity for faculty and staff to gain a better understanding of how to assess the level of project management self-efficacy and the confidence in the ability to apply project management. The project management training did lend support for improving both self-efficacy and the confidence in the ability to apply project management.

Faculty and staff can utilize the findings of this study to address a number of issues that are present in the higher education environment. These issues range from time management, project organization, research management, facilities/operations, curriculum development, new program creation, and any other tasks that involve project type work. The results of the implementation of project management could enhance job performance, financial efficiency and productivity among other things. The study advanced the concepts of project management in the professional practice of higher education, which is not traditionally known for the utilization of project management techniques and skills. The research further supported the effort to explore new avenues in which project management can add to the applications to professional practice in higher education.

The findings of the testing suggest a number of applications to improve practices relevant to higher education. The findings for the first and second research questions indicated that there is an opportunity to expand the level of self-efficacy toward project management and confidence in the ability to apply project management among faculty/staff. The findings also indicated that the understanding of project management can be significantly increased through the implementation of project management training in higher education. This evidence supports the idea that project management training can increase the self-efficacy of faculty/staff towards project management and also increase the ability to utilize project management skills within their tasks.

The testing results for the third research question indicated that was a significant increase in improvement of self-efficacy in project management for faculty/staff with lower level project work experience after project management training. The findings also indicated a significant increase in improvement in the confidence in the ability to apply project management for faculty/staff with lower level project work experience after project management training. The application of these results could support the concept that project management training has value among faculty/staff with lower levels of project work experience. According to the testing results, project management training among faculty/staff with lower levels project work experience could be an effective method creating opportunities for faculty/staff to use project management to address project work in higher education. The results indicated that project management training does increase the self-efficacy in lower level project work experience faculty/staff, which could increase the self-efficacy to implement project management techniques.

The findings of the testing for the fourth research question indicated that project management training for higher level project work experience faculty/staff was less effective than lower level project work experience faculty/staff. Applying the results from research question three and four can help define which elements of project management training are the most pertinent to higher education. The results indicated that there was evidence of improvements in lower level project work experience and no significant improvement in higher level project work experience faculty/staff. The improvements were present if both self-efficacy and confidence in the ability to apply project management. This is important since self-efficacy is an effective predictor of future performance (Bandura, 1982, 1997).

The results of the testing for research questions five and six further reinforce that the level of improvement in both self-efficacy and confidence in the ability to apply project management was greater for lower level project work experience faculty/staff than higher level project work experience faculty/staff. These results support the need for project management training to be adjusted to the level of project work experience. Individuals with lower level project work experience appear to have gained some level of educational benefit from the project management training while it is not as clear for those with higher level project work experience.

The results of the study contribute to the application of practice of project management by first indicating the benefits of project management training within higher education. The application of project management practice is well documented in traditional industries such as engineering, construction and defense but lacks application in higher education (Bryde & Leighton, 2009). This study, along with the study of (McCreery, 2003), provides research to support the benefits of project management training in areas which are outside of traditional settings. Bryde and Leighton (2009) noted that institutes of higher education are altering their

approach to doing business by becoming more project driven and the confidence to apply project management practices therefore increases. The results of the study identified at least the first step in evaluating the self-efficacy of faculty/staff towards project management practices and can be used to create a benchmark of project management within higher education.

Biblical Implications

The implication of the findings in relation to the biblical framework can be linked to a number of project management concepts that are found throughout the Bible. One such concept is project prioritizing. The idea of prioritizing projects is not a new concept, but one that was present even from the beginning of time. God demonstrated a seven-day project in the book of Genesis in how the earth and mankind was to be created. Later in the book of Nehemiah, recognized the need for a project to reconstruct the walls of Jerusalem. God expects His people to recognize things in their lives that effectively align with His word and commandments. We all have many decisions to make throughout of lives, but we should choose those that honor God and provide for the advancement of His kingdom.

Another finding in relation to the biblical framework include the project management concept of project baselines; establishing baselines in a biblical sense can ensure consistency. A correspondence can be drawn between project baselines and managing important baselines in the Christian walk. From a Christian perspective, it is important for us to establish a standard in our faith. In II Timothy 1:13, the Bible reminds us to keep a pattern of sound teaching and faith in Christ Jesus. Maintaining benchmarks is critical in both faith and in project management.

There are many examples of how project management and project operations played a role in biblical events. For example, in Genesis 6:9-22 (NIV) Noah constructed the ark according to God's specifications. God provided Noah with detailed instructions on the

dimensions of the ark and God's use of the ark was a temporary project in relation to His plan of flooding the earth. A second example is found in Chapters 5-7 of I Kings (NIV) in which King Solomon constructs the temple according to strict specifications. Without efficient project management and operations, the temple would have never been completed in a timely manner. One could even view the life of Jesus on Earth as a project designed by God. He sent His only son to complete the greatest project in the history of mankind.

Recommendations for Action

The environment of higher education is not one that is void of projects, and the study identified some gaps in reference to the use of project management within higher education. The results of the study are applicable to any faculty or staff member of higher education since project work may be present in the activities in a college institution. These project opportunities provide the chance to implement project management techniques to solve a variety of problems, which may occur with any type of project work. Therefore, the results of the study may be beneficial to any stakeholder in higher education that desires to increase efficiency, effectiveness, or the ability to increase production.

One recommendation is to use the study to increase awareness of project management among higher education faculty and staff. The results of the study could add to the body of knowledge through a number of project management journals and articles so that the practices of project management are exposed to professions, which may lie outside of traditional project management environments. Under this premise, the literature gaps that exist would be addressed by providing additional insight into how project management can extend to new realms of possibilities.

Another recommendation for action is to utilize this study to create staff development opportunities to increase project management application in higher education. Faculty and staff members are required to obtain specific hours of staff development and project management training can satisfy that requirement. In return, the benefits of project management training can be put into action to address a number of issues facing higher education. However, systems of higher education must embrace the concepts of project management and be creative in using project management techniques outside of the traditional boundaries.

Recommendations for Further Study

According to literature, there is a lack of research related to the implementation of formal project management in higher education (Austin et al., 2013; Burgher & Snyder, 2012b; Stewart-Mailhiot, 2015). Although project management is well documented in traditional applications, such as construction, it is far less common within an academic setting (Clark, 2008; Badiru et al., 2010). More specifically, studies that examine project management training efficacy are limited, and there is no evidence of previous meta-analysis on project management training efficacy (Chiocchio et al., 2015). This can create both a challenge and opportunity to develop the concepts within the contexts of higher education in further studies.

First, further studies may include applying project management practices to an actual project within higher education. Similar practices used in this study through project management training could be extended. This application of project management would further extend the effects of project management training in a higher education setting and provide an opportunity to gather more information on the usage of project management techniques. Additional studies could include how project management could be applied to research projects, new program development, curriculum development, and any other project associated within higher education.

Secondly, further studies should be conducted on how different types of project management training may affect faculty and staff self-efficacy. The type of training used in this study was self-paced and delivered through an electronic presentation method. Further studies could include live project management training courses of some other type of delivery method, which may provide greater opportunity to retain project management information.

Thirdly, further studies could involve focusing on more specific staff positions in higher education, which may include tasks that are more conducive to project management techniques. These positions may include those in working in facilities and operations of an institution of higher education. A study that is more specific to job positions which are more closely related to project management activities may prove to be valuable.

Reflections

The results of the study were what I expected. I expected to see an increase in self-efficacy levels and the confidence in the ability to apply project management after the participants completed the training. Some unexpected results were identified in the research. One unexpected result from the data was the number of years of project work experience indicated by the participants. Those indicating over 15 years of project work experience was much higher than anticipated. Another unexpected result was the higher levels of project management knowledge and confidence in the ability to apply project management in both the pre-training survey and post-training survey. I anticipated lower levels of both project management knowledge and the confidence in the ability to apply project management among faculty and staff in a higher education environment.

Further reflections on the study include how participants perceive project management and more specifically how they perceive project work experience. I expected that the faculty and

staff would indicate less project work experience and less knowledge of project management techniques. This expectation, along with others, did not result in known bias within the study but rather an unexpected result of the data.

The process of developing the study has proven to be challenging at times. It has been a journey that has proven to be both frustrating and rewarding. The biggest challenges have included keeping pace with the demands of meeting deadlines, staying within scope of the study, and maintaining the discipline to stay the course. However, there are rewards from the efforts over the last three years. These rewards mark the purpose behind the countless hours of research and writing. To know that the study will add to the literature and provide closure to gaps that may exist is rewarding. It is also rewarding to know that the concepts of project management have been extended to applications in higher education and that new ideas may evolve from the results.

Project management offers so many avenues to address issues, and this study offers an additional look into how it can extend to the profession of higher education. For so many colleges, project management is an active course that is taught, but it is often overlooked as a viable option to implement with the process and operations of the college. This study attempts to add to the application of project management and provide an additional tool for faculty and staff to utilize in whatever capacity that is compatible with project management.

From a biblical perspective, God expects us to add value to others, which may require us to alter our scope of what is truly important. According to Van Duzer (2010), God's purpose of business is not to only be focused on the return on investment, but to consider the core competencies of the organization and direct the operations in such a way that best serves the employees, customers and community. Implementing the practices of project management

offers the opportunity for faculty and staff to increase the effectiveness of projects and therefore add value to services they provide to others.

Summary and Study Conclusions

The purpose of this study was to add to the literature regarding how project management training can increase the efficacy and confidence in the ability to apply project management techniques in higher education among faculty/staff. The study included a sample of faculty/staff from a two-year technical college who participated in a pre-training survey, a project management training treatment, and a post-training survey.

The results of the study indicated there is a significance statistical difference between pre-training and post-training project management self-efficacy among faculty/staff in a two-year technical college. However, the findings indicated that this is true among those with lower levels of project management knowledge and not those with higher levels of project work experience. The study also indicated that same result for the confidence in the ability to apply project management. There was a significance statistical difference between pre-training and post-training confidence in the ability to apply project management among faculty/staff in a two-year technical college. Once again, the statistical significance was among lower level project work experience and not higher level project work experience. Ultimately, the research concluded that faculty/staff with lower level project work experience demonstrate increased levels of improvement after receiving project management training than those faculty/staff with higher levels of project work experience.

This study provides research that addresses gaps in literature surrounding project management self-efficacy among faculty/staff in a two-year technical college. The study builds upon the research conducted by McCreery (2003), but extends the research to close the gap in

the literature by offering additional insight into project management in higher education. It provides necessary groundwork for future studies on the relationship between project management training and self-efficacy.

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Appendix A: Sample Size

Sample size for before-after study (Paired T-test)

Measure a continuous outcome y in each subject at the start and end of the study period. For each subject, calculate the change $\Delta = y_{start} - y_{end}$. Compare the mean value of Δ to 0. This requires the standard deviation $S(\Delta)$. The estimate of $S(\Delta)$ should be based on data from other subjects who were followed for similar time periods.

Instructions: Enter parameters in the red cells. Answers will appear in blue below.

α (two-tailed) =	0.050	*Threshold probability for rejecting the null hypothesis. Type I error rate.*
β =	0.200	*Probability of failing to reject the null hypothesis under the alternative hypothesis. Type II error rate.*
E =	0.500	*Effect size*
S(Δ) =	1.000	*Standard Deviation of the CHANGE in the outcome. (If you don't know S(Δ), click here to calculate it.)*

Calculate

The standard normal deviate for $\alpha = Z_\alpha = 1.960$

The standard normal deviate for $\beta = Z_\beta = 0.842$

A = 1.000

$B = (Z_\alpha + Z_\beta)^2 = 7.849$

$C = (E/S(\Delta))^2 = 0.250$

AB/C = 31.40

Group size N: 31

Reference: Rosner B. *Fundamentals of Biostatistics.* 4th ed. Duxbury Press; 1995. Page 221.

Appendix B: Project Work Experience

Project Management Self-efficacy Pre-training Survey

Project Work Experience

2. Describe your previous project work experience based upon your total professional work history. (Project work can be defined as participating in an endeavor to produce a product, service or result in a given time frame by utilizing resources. Project work could include, but not limited to: developing a new product, rebuilding a structure, organizing events, developing an internship program, consolidating two merging companies, or any other task that has a clear beginning and end.)

Zero project work experience	Less than one year project work experience	1-2 years of project work experience	3-5 years of project work experience	5-10 years of project work experience	10-15 years of project work experience	Over 15 years of project work experience
◯	◯	◯	◯	◯	◯	◯

4

Appendix C: Pre-training Survey

Project Management Self-efficacy Pre-training Survey

Statement of Research

CONSENT FORM

A QUANTITATIVE EXAMINATION OF THE RELATIONSHIP BETWEEN PROJECT MANAGEMENT TRAINING AND PROJECT MANAGEMENT SELF-EFFICACY

Alan Stanfield
Liberty University
School of Business

You are invited to be in a research study to examine the relationship between project management training and project management self-efficacy. You were selected based upon your employment as a faculty/staff member of a two-year technical college. I ask that you read this form and ask any questions you may have before agreeing to be in the study.

Alan Stanfield, a doctoral candidate in the School of Business at Liberty University, is conducting this study.

Background Information: The purpose of this quantitative study is to examine the relationship between project management training and the faculty/staff self-efficacy towards the implementation of project management techniques within higher education.

Procedures: If you agree to be in this study, I would ask you to complete the following steps:

1. Complete a 10-minute pre-test survey about previous project work experience, knowledge of project management, and the ability to apply project management skills.
2. Participant in a 30-minute lesson on basic project management.
3. Complete a 10-minute post-test survey about your knowledge of project management and the ability to apply project management skills.

Risks and Benefits of being in the Study: The risks involved in this study are minimal, no more than you would encounter in everyday life.
Participants of the study are expected to gain some knowledge of project management, which could be utilized in a higher education setting.

Compensation: Participants will not be compensated for participating in this study.

Confidentiality: The records of this study will be kept private. In any sort of report I might publish, I will not include any information that will make it possible to identify a subject. Research records will be stored securely and only the researcher will have access to the records. We may share the data we collect from you for use in future research studies or with other researchers. The research

1

will use a third-party survey provide to maintain anonymity of the responses. The data will be stored electronically and will be deleted three years upon completion of the study per federal regulations.

Voluntary Nature of the Study: Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Liberty University. If you decide to participate, you are free to withdraw at any time without affecting those relationships. Once the surveys have been submitted, it will be impossible to withdraw responses due to the anonymous nature of the study.

How to Withdraw from the Study: If you choose to withdraw from the study, please exit the survey and close your internet browser. Your responses will not be recorded or included in the study.

Contacts and Questions: The researcher conducting this study is Alan Stanfield. If you have questions, please contact him at astanfield@liberty.edu. The chair of the study is Dr. Andrew Light and may be contacted at thlai@liberty.edu.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, please contact the Institutional Review Board, 1971 University Blvd, Green Hall 1887, Lynchburg, VA 24515 or email at irb@liberty.edu.

Please notify the researcher if you would like a copy of this information for your records.

Statement of Consent: I have read and understood the above information.

Project Management Self-efficacy Pre-training Survey

Preliminary Question

1. Are you a faculty/staff member of a two-year technical college?

- ◯ Yes
- ◯ No

3

Project Management Self-efficacy Pre-training Survey

Project Work Experience

2. Describe your previous project work experience based upon your total professional work history. (Project work can be defined as participating in an endeavor to produce a product, service or result in a given time frame by utilizing resources. Project work could include, but is not limited to: developing a new product, rebuilding a structure, organizing events, developing an internship program, consolidating two merging companies, or any other task that has a clear beginning and end.)

Zero project work experience	Less than one year project work experience	1-2 years of project work experience	3-5 years of project work experience	5-10 years of project work experience	10-15 years of project work experience	Over 15 years of project work experience
○	○	○	○	○	○	○

Project Management Self-efficacy Pre-training Survey

Level of Project Management Knowledge

3. Assess your current level of project management knowledge in the following areas.
(1 = Extremely low level: 7 = Extremely high)

	1	2	3	4	5	6	7
Project life cycle	○	○	○	○	○	○	○
Project planning in general	○	○	○	○	○	○	○
Assessing project risks	○	○	○	○	○	○	○
Establishing project scope	○	○	○	○	○	○	○
Sequencing project activities	○	○	○	○	○	○	○
Estimating project activity times	○	○	○	○	○	○	○
Project budgeting	○	○	○	○	○	○	○
Allocating project resources	○	○	○	○	○	○	○
Developing project performance measures	○	○	○	○	○	○	○
Overall confidence of project management knowledge	○	○	○	○	○	○	○

Project Management Self-efficacy Pre-training Survey

Ability to Apply Project Management Knowledge

4. Assess how confident you are in your ability to effectively apply your knowledge of project management in each of the following areas.
(1 = Extremely low level of confidence; 7 = Extremely high level of confidence)

	1	2	3	4	5	6	7
Project organizational design	○	○	○	○	○	○	○
Project planning in general	○	○	○	○	○	○	○
Assessing project risks	○	○	○	○	○	○	○
Establishing project scope	○	○	○	○	○	○	○
Sequencing project activities	○	○	○	○	○	○	○
Estimating project activity times	○	○	○	○	○	○	○
Project budgeting	○	○	○	○	○	○	○
Allocating project resources	○	○	○	○	○	○	○
Developing project performance measures	○	○	○	○	○	○	○
Overall ability to apply project management knowledge	○	○	○	○	○	○	○

Appendix D: Basic Project Management Course

THIS LESSON WILL COVER:

- Defining a project and project management
- Establishing project scope
- Project life cycle
- Project planning in general
- Assessing project risk
- Sequencing project activities
- Estimating project activity times
- Project budgeting
- Allocating project resources
- Developing project performance measures

PROJECT MANAGEMENT KEY TERMS

- **Project:** a temporary endeavor to accomplish a desired outcome through a series of activities within a specific timeframe (Gido & Clements, 2015)
- **Project scope:** represents all the work (activities) that must be completed in order to produce the desired outcome (Gido & Clements, 2015)
- **Deliverable:** a tangible outcome or result that the project produces (Gido & Clements, 2015)
- **Risk:** anything can could adversely affect the outcome of the project (Gido & Clements, 2015)
- **Sponsor (customer):** the entity that provides the funds required to accomplish the project (Gido & Clements, 2015)
- **Resources:** people, equipment, facilities, and materials that are used to perform the project activities (Gido & Clements, 2015)

WHAT IS A PROJECT?

First, it is important to understand what is a **project**. A **project** is a temporary endeavor to accomplish a unique product, service or result. A **project** can be any task or activity that has a clear starting point and ending point. Any task or activity which is routine and repetitive is not considered a project.

WHAT IS AND IS NOT A PROJECT?

Examples of projects:

- Developing a new product
- Planning a wedding
- Organizing a conference
- Building a shopping mall
- Developing a brochure
- Designing an internship program
- Coordinating the relocation of offices

Examples of non-project work:

- Entering daily sales receipts
- Assembly line work
- Processing applications
- Driving a delivery truck
- Performing routine medical exams
- Monitoring air traffic

WHAT IS PROJECT MANAGEMENT?

Project management is planning, organizing, coordinating, leading and controlling resources to achieve the project objective. **Project management** is a process of developing a plan to work and then working the plan. However, **project management** is more than just a set of tools and techniques; it is a results driven management style which focuses on building relationships among a variety of people and resources (Gido & Clements, 2015).

Click video ⟶

ESTABLISHING PROJECT SCOPE

Project **scope** is the work that must be completed in order to produce an outcome, and the requirements and specifications that must be met in order to accomplish the project objective (Gido & Clements, 2015).

Project Scope

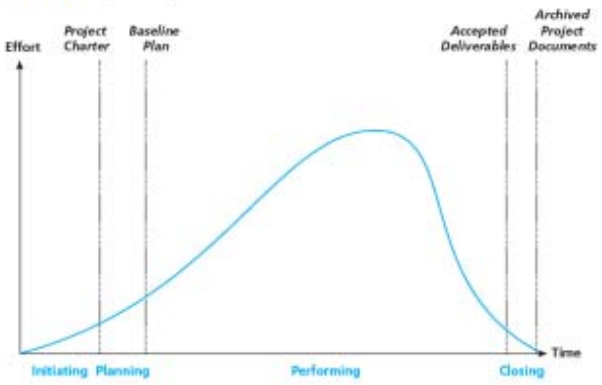
- Defines what needs done
- Includes
  - Items contained in project charter, RFP, proposal
  - More detail
- Establishes common understanding of scope with stakeholders

Project Scope Document

- Usually contains
  - Customer requirements
  - Statement of Work
  - Deliverables
  - Acceptance Criteria
  - Work Breakdown Structure
- Establishes baseline
- Change control system to avoid scope creep

PROJECT LIFE CYCLE

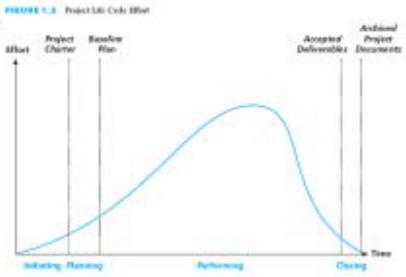
FIGURE 1.2 Project Life Cycle Effort



(Gido & Clements, 2015)

PROJECT LIFE CYCLE: INITIATING PHASE

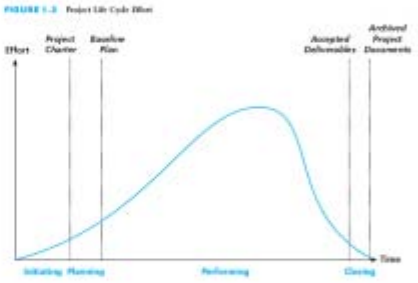
- First phase
- Identify need, problem, or opportunity
- Determine to select project
- Develop project charter
  - Rationale
  - Project objective
  - Expected benefits
  - General requirements and conditions



(Gido & Clements, 2015)

PROJECT LIFE CYCLE: PLANNING PHASE

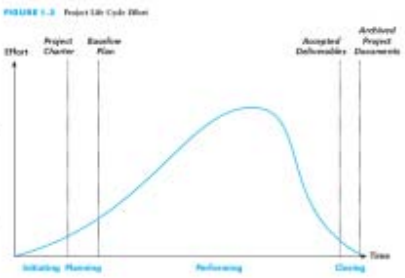
- Second Phase
- Show how project scope will be accomplished
- Plan the work and work the plan
- Develop baseline plan
  - *What needs to be done* -- scope, deliverable
  - *How it will get done* -- activities, sequence
  - *Who will do it* -- resources, responsibilities
  - *How long it will take* -- durations, schedule
  - *How much it will cost* -- budget
  - *What the risks are*
- Have actual resources plan the work



(Gido & Clements, 2015)

PROJECT LIFE CYCLE: PERFORMING PHASE

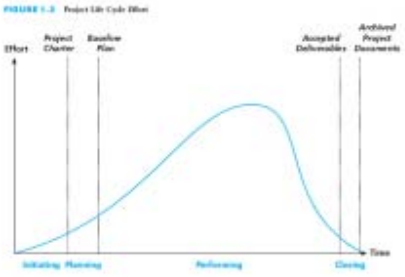
- Third phase
- Accomplish project objectives
  - Project manager leads
  - Project team completes the project
- Increase pace as more resources are addec
- Monitor and control progress
- Take corrective action as needed
- Manage and control changes with sponsor
- Achieve customer satisfaction with acceptance of deliverable



(Gido & Clements, 2015)

PROJECT LIFE CYCLE: CLOSING PHASE

- Final phase
- Collect and make final payments
- Recognize and evaluate staff
- Conduct post project evaluation
- Document lessons learned
- Archive project documents
- Record lessons learned



(Gido & Clements, 2015)

PROJECT PLANNING

Project planning involves determining what needs to be done (scope), how to get it done (activities), who will perform it (resources), how much time will it take (schedule), how much it will cost (budget), and what are the risks (Gido & Clements, 2015).

- Establish project objective
- Define scope
- Create WBS
- Assign responsibility
- Define specific activities
- Sequence activities
- Estimate activity resources
- Estimate activity durations
- Develop project schedule
- Estimate activity costs
- Determine budget

Click video

ASSESSING PROJECT RISKS

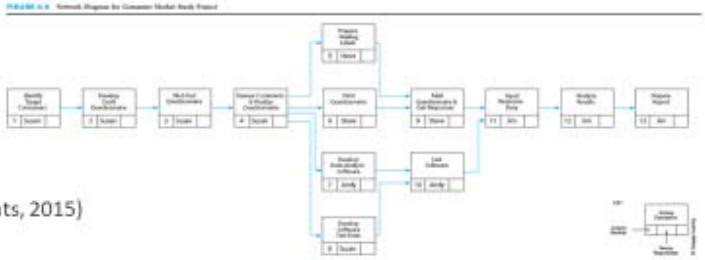
Risk is an uncertain event that, if it occurs, can jeopardize accomplishing the project objective. An example of a risk could be installing a new software program on a college campus that could result in unexpected system downtime (Gido & Clements, 2015).

- Risk management includes identification, assessment, control, and response to project risks in order to minimize the likelihood of occurrence and/or the potential impact of adverse events on the accomplishment of the project objective.
- Risk identification includes determining which risks may adversely affect the project objective and estimating what the potential impacts of each risk might be if it occurs.
- Assessing each risk involves determining the likelihood that the risk event will occur and the degree of impact the event will have on the project objective, and then prioritizing the risks.
- A risk response plan is a defined set of actions to prevent or reduce the likelihood of occurrence or the impact of a risk, or to implement if the risk event occurs.
- Regularly review and evaluate all risks to determine if there are any changes to the likelihood of occurrence or the potential impact of any of the risks, or if any new risks have been identified.

SEQUENCING AND ESTIMATING PROJECT ACTIVITIES

A project **activity** is also known as a task and defines more specifically how the work will be done. **Activities** or tasks are placed in sequence so that it provides an orderly completion of the project.

- The activities or tasks are then assigned to specific people, divisions, or groups so that form of network of activities with the completion of the project as the goal.
- Estimating the activity times is critical since certain activities may be depend upon the completion of another activity.
- Activities can be used to produce a schedule that specifies when it activity can begin and finish.



(Gido & Clements, 2015)

PROJECT BUDGETING

The **budget** of a project is the amount the customer is willing to pay for the agreed project deliverables. For example, the budget for a project to develop a new program of study at a college may include faculty, equipment, supplies, accreditation fees, and remodeling costs (Gido & Clements, 2015).

- A **budget** can include salaries, supplies, equipment, facilities, and fees associated with performing the tasks.
- The total project cost is often estimated during the initiating phase of the project when the project charter or a proposal is prepared, but detailed plans are not usually prepared at that time.

Elements

- Labor
- Materials
- Equipment
- Facilities
- Subcontractors and consultants
- Travel
- Reserve

Good Practices

- Have the person responsible estimate costs
- Use historical data to inform current project
- Be reasonable and realistic
- Estimate near-term activities more accurately
- Elaborate other costs as additional information known

PROJECT RESOURCES

Resources are necessary to perform each activity, produce the project deliverable, and achieve the project's objective (Gido & Clements, 2015).

- **Resources** can include people, equipment, supplies, materials, and facilities.
- The availability of resources must align with schedule of activities to ensure that timeframe of the project stays on track.

Click video

PROJECT PERFORMANCE MEASURES

Project **performance measures** are important since they provide the status of the project, accomplishments of the activities, monitor key milestones of the project, and identification of potential problems (Gido & Clements, 2015).

- Performance measures often identify and monitor project *milestones*. Milestones are key dates for the development of important events in the project schedule. For example, a milestone for construction a new office area might be the completion of the framing rough in.
- Performance measures should be maintained through regular progress reports which provide status of milestones, specific goals of the project, and cost.
- Monitoring projects through performance measures ensures that the project scope remains in focus along with detecting any problems that may be on the horizon which provides time to implement corrective action.

SUMMARY

- A project is an endeavor to accomplish a specific objective through a unique set of interrelated activities and the effective utilization of resources.
- The successful accomplishment of the project objective could be constrained by many factors, including scope, quality, schedule, budget, resources, risks, customer satisfaction, and stakeholder support.
- The project life cycle has four phases: initiating, planning, performing, and closing the project.
- Project management is planning, organizing, coordinating, leading, and controlling resources to accomplish the project objective. The project management process involves two major functions: first establishing a plan and then executing that plan to accomplish the project objective.
- The ultimate benefit of implementing project management techniques is having a satisfied customer—whether you are the customer of your own project or a business (contractor) being paid by a customer to perform a project.

(Gido & Clements, 2015)

REFERENCES

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Appendix E: Post-training Survey

Project Management Self-efficacy Post-training Survey

Statement of Research

CONSENT FORM

A QUANTITATIVE EXAMINATION OF THE RELATIONSHIP BETWEEN PROJECT MANAGEMENT TRAINING AND PROJECT MANAGEMENT SELF-EFFICACY

Alan Stanfield
Liberty University
School of Business

You are invited to be in a research study to examine the relationship between project management training and project management self-efficacy. You were selected based upon your employment as a faculty/staff member of a two-year technical college. I ask that you read this form and ask any questions you may have before agreeing to be in the study.

Alan Stanfield, a doctoral candidate in the School of Business at Liberty University, is conducting this study.

Background Information: The purpose of this quantitative study is to examine the relationship between project management training and the faculty/staff self-efficacy towards the implementation of project management techniques within higher education.

Procedures: If you agree to be in this study, I would ask you to complete the following steps:

1. Complete a 10-minute pre-test survey about previous project work experience, knowledge of project management, and the ability to apply project management skills.
2. Participant in a 30-minute lesson on basic project management.
3. Complete a 10-minute post-test survey about your knowledge of project management and the ability to apply project management skills.

Risks and Benefits of being in the Study: The risks involved in this study are minimal, no more than you would encounter in everyday life.
Participants of the study are expected to gain some knowledge of project management, which could be utilized in a higher education setting.

Compensation: Participants will not be compensated for participating in this study.

Confidentiality: The records of this study will be kept private. In any sort of report I might publish, I will not include any information that will make it possible to identify a subject. Research records will be stored securely and only the researcher will have access to the records. We may share the data we collect from you for use in future research studies or with other researchers. The research

1

will use a third-party survey provide to maintain anonymity of the responses. The data will be stored electronically and will be deleted three years upon completion of the study per federal regulations.

Voluntary Nature of the Study: Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Liberty University. If you decide to participate, you are free to withdraw at any time without affecting those relationships. Once the surveys have been submitted, it will be impossible to withdraw responses due to the anonymous nature of the study.

How to Withdraw from the Study: If you choose to withdraw from the study, please exit the survey and close your internet browser. Your responses will not be recorded or included in the study.

Contacts and Questions: The researcher conducting this study is Alan Stanfield. If you have questions, please contact him at astanfield@liberty.edu. The chair of the study is Dr. Andrew Light and may be contacted at thlai@liberty.edu.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, please contact the Institutional Review Board, 1971 University Blvd, Green Hall 1887, Lynchburg, VA 24515 or email at irb@liberty.edu.

Please notify the researcher if you would like a copy of this information for your records.

Statement of Consent: I have read and understood the above information.

Project Management Self-efficacy Post-training Survey

Level of Project Management Knowledge

1. Access your current level of project management knowledge in the following areas.
(1 = Extremely low level: 7 = Extremely high)

	1	2	3	4	5	6	7
Project life cycle	○	○	○	○	○	○	○
Project planning in general	○	○	○	○	○	○	○
Assessing project risks	○	○	○	○	○	○	○
Establishing project scope	○	○	○	○	○	○	○
Sequencing project activities	○	○	○	○	○	○	○
Estimating project activity times	○	○	○	○	○	○	○
Project budgeting	○	○	○	○	○	○	○
Allocating project resources	○	○	○	○	○	○	○
Developing project performance measures	○	○	○	○	○	○	○
Overall confidence of project management knowledge	○	○	○	○	○	○	○

Project Management Self-efficacy Post-training Survey

Ability to Apply Project Management Knowledge

2. Assess how confident you are in your ability to effectively apply your knowledge of project management in each of the following areas.
(1 = Extremely low level of confidence; 7 = Extremely high level of confidence)

	1	2	3	4	5	6	7
Project organizational design	○	○	○	○	○	○	○
Project planning in general	○	○	○	○	○	○	○
Assessing project risks	○	○	○	○	○	○	○
Establishing project scope	○	○	○	○	○	○	○
Sequencing project activities	○	○	○	○	○	○	○
Estimating project activity times	○	○	○	○	○	○	○
Project budgeting	○	○	○	○	○	○	○
Allocating project resources	○	○	○	○	○	○	○
Developing project performance measures	○	○	○	○	○	○	○
Overall ability to apply project management knowledge	○	○	○	○	○	○	○

Appendix F: Email Instructions

November 20, 2017

Dear Recipient:

As a graduate student in the School of Business at Liberty University, I am conducting research as part of the requirements for a doctoral degree. The purpose of my research is to examine the relationship between project management training and the faculty/staff self-efficacy towards the implementation of project management techniques within higher education. I am writing to invite you to participate in my study.

If you are a faculty or staff member of a two-year technical college, and are willing to participate, you will be asked to complete a pre-training survey, basic project management training and then a brief post-training survey. It should take approximately 90 minutes of your time to complete the procedures listed. Your participation will be completely anonymous, and no personal, identifying information will be collected.

To participate, follow the instructions provided below.

Step 1: Click on the survey link included below.

Pre-training survey link: https://www.surveymonkey.com/r/CFQSC7L

Step 2: Review the consent information

Consent information is contained within the first page of the pre-training survey. The consent page contains additional information about my research, but you do not need to sign and return it. Please read the consent information before you proceed with the survey.

Step 3: Complete the pre-training survey

This step includes completing a (4) question pre-training survey which contains information related to previous project work experience, project management knowledge, and the confidence in the ability to apply project management techniques. Time requirement: 10 minutes

Step 4: Project management training

Once you have completed the pre-training survey, you will need to open the attached project management training file. This training involves reading project management information and viewing training videos. Once you have completed the project management training, you may proceed to Step 5. Time requirement: 60 minutes

Step 5: Complete the post-training survey

This step includes completing a (2) question post-training survey, which contains information related to project management knowledge and the confidence in the ability to apply project management techniques. A link to the post-training survey is below. Time requirement: 10 minutes

Post-training survey link: https://www.surveymonkey.com/r/CHQGWNY

Sincerely,

Alan W. Stanfield
Doctoral Candidate

Appendix G: Letter of Informed Consent

The Liberty University Institutional Review Board has approved this document for use from 11/17/2017 to --
Protocol # 3045.111717

CONSENT FORM

A QUANTITATIVE EXAMINATION OF THE RELATIONSHIP BETWEEN PROJECT MANAGEMENT TRAINING AND PROJECT MANAGEMENT SELF-EFFICACY

Alan Stanfield
Liberty University
School of Business

You are invited to be in a research study to examine the relationship between project management training and project management self-efficacy. You were selected based upon your employment as a faculty/staff member of a two-year technical college. I ask that you read this form and ask any questions you may have before agreeing to be in the study.

Alan Stanfield, a doctoral candidate in the School of Business at Liberty University, is conducting this study.

Background Information: The purpose of this quantitative study is to examine the relationship between project management training and the faculty/staff self-efficacy towards the implementation of project management techniques within higher education.

Procedures: If you agree to be in this study, I would ask you to complete the following steps:

1. Complete a 10-minute pre-test survey about previous project work experience, knowledge of project management, and the ability to apply project management skills.
2. Participant in a 60-minute lesson on basic project management.
3. Complete a 10-minute post-test survey about your knowledge of project management and the ability to apply project management skills.

Risks and Benefits of being in the Study: The risks involved in this study are minimal, no more than you would encounter in everyday life.

Participants of the study are expected to gain some knowledge of project management, which could be utilized in a higher education setting.

Compensation: Participants will not be compensated for participating in this study.

Confidentiality: The records of this study will be kept private. In any sort of report I might publish, I will not include any information that will make it possible to identify a subject. Research records will be stored securely and only the researcher will have access to the records. We may share the data we collect from you for use in future research studies or with other researchers. The research will use a third-party survey provider to maintain the anonymity of the responses. The data will be stored electronically and will be deleted three years upon completion of the study per federal regulations.

Voluntary Nature of the Study: Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Liberty University. If you

decide to participate, you are free to withdraw at any time prior to submitting your survey without affecting those relationships. Once surveys are submitted, it will be impossible to withdraw responses due to the anonymous nature of the study.

How to Withdraw from the Study: If you choose to withdraw from the study, please exit the survey and close your internet browser. Your responses will not be recorded or included in the study.

Contacts and Questions: The researcher conducting this study is Alan Stanfield. If you have questions, please contact him at astanfield@liberty.edu. The chair of the study is Dr. Andrew Light, and may be contacted at thlai@liberty.edu.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, please contact the Institutional Review Board, 1971 University Blvd, Green Hall 1887, Lynchburg, VA 24515 or email at irb@liberty.edu.

Please notify the researcher if you would like a copy of this information for your records.

Statement of Consent: I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.

Appendix H: IRB Approval Letter

Appendix H: IRB Approval Letter

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

November 17, 2017

Alan Stanfield
IRB Exemption 3045.111717: A Quantitative Examination of the Relationship between Project Management Training and Project Management Self-Efficacy

Dear Alan Stanfield,

The Liberty University Institutional Review Board has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study to be exempt from further IRB review. This means you may begin your research with the data safeguarding methods mentioned in your approved application, and no further IRB oversight is required.

Your study falls under exemption category 46.101(b)(2), which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46:101(b):

> (2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless:
> (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

Please note that this exemption only applies to your current research application, and any changes to your protocol must be reported to the Liberty IRB for verification of continued exemption status. You may report these changes by submitting a change in protocol form or a new application to the IRB and referencing the above IRB Exemption number.

If you have any questions about this exemption or need assistance in determining whether possible changes to your protocol would change your exemption status, please email us at irb@liberty.edu.

Sincerely,

G. Michele Baker, MA, CIP
Administrative Chair of Institutional Research
The Graduate School

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