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Exploring Maintenance and Facility Operations Strategies for California Community Colleges

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

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Abstract

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MBA, St. Thomas University, 2006

BS, Regis University, 2005

Doctoral Study Submitted in Partial Fulfillment

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Abstract

California community college leaders are looking for strategies to sustain facilities and maintenance operations because the governor only approved the allocation of $87.5 million in the 2014-2015 Budget Act for facilities maintenance operations. Guided by the change and strategy theories, the purpose of this multicase study was to explore the strategies that a select group of college leaders have used to sustain or improve their facilities maintenance operations. The data collection process included a review of college planning documents and semistructured interviews with 10 senior administrators from 3 large California community colleges who have used strategies to address sustaining or improving their facilities maintenance operations. Saldana coding and an inductive analysis process were used to identify themes. Triangulation was employed to increase the trustworthiness of interpretations. The analysis revealed the central role of planning as the strategy leaders should employ to improve institutional success. Funding was an additional theme leaders regarded as the issue that most often undermined planning and effective maintenance operations. All participants acknowledged the need for the integration of planning and funding to create institutional success. These findings suggest that community college leaders who use planning, funding strategies, maintenance strategies, and who empower people to sustain facility and maintenance operations can improve the teaching-learning environment. When community college leaders transform the teaching-learning environment, they enable student success. Student success increases the earning power of students that contributes to social change by expanding the tax-base and creating greater economic development.

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Dedication

This study and all of the effort I put into completing it is dedicated to my children, Diego and Isabel. I hope and pray they will be proud of my efforts and use the accomplishment of this study and degree completion as inspiration for them to become life-long learners and influence the global good.

Acknowledgments

I wish to acknowledge my mother, Preciosa, whose love and devotion gave me the inspiration never to give up. I know that her prayers and the ever special beacon of love from my father above, helped give me the tenacity to succeed. To my husband Robert, who has always been beside me, thank you for your support and love. To my Parras Family - Frank, Kristy, Kristina, Frankie, Diego and Courtney, I am also extremely grateful for the love and support you gave me in this effort. To all of my other family members and friends whose encouragement sustained me – THANK YOU! A sincere thank you to my mentor, Chancellor, and committee chair, Dr. Arthur Q. Tyler, whose guidance and support made this dream a reality. I am so grateful to the responsiveness and direction provided by my committee members Dr. Mohamad S. Hammoud, and Dr. Yvonne Doll. I am also very thankful and appreciative of the support Ms. Yvette Thompson provided. Finally, I wish to extend a special thank you to Dr. Freda Turner for her leadership in this arduous journey.

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Section 1: Foundation of the Study

For more than 110 years, community colleges have provided the preparation needed to enhance the workforce of America, entry into academic programs, continuing education, and responses to the needs of business in a changing economic environment (Cohen & Kisker, 2014). Community colleges are one of the largest business consortiums in the world as they collectively serve more than 12 million students on a near daily basis in the United States (American Association of Community Colleges, 2015). Los Angeles, Miami Dade, Los Rios, San Francisco, San Diego, Hillsbourgh, Chicago, Dallas, and Houston are among the community colleges that have annual operating budgets and assets of more than $500 million dollars each (Department of Education, 2015). In terms of economic impact, leaders of community colleges are critical employers, purchasers, and contractors affecting local economies (Nickoli, 2013).

Background of the Problem

Community colleges educate 75% of college students in California (California Community College Chancellor's Office, 2014a). Of the 1.176 million California community colleges' full-time equivalent students (FTES), more than 97% of academic and student service operations were on-ground and facilities dependent (California Community College Chancellor's Office, 2015a). California community colleges have more than $1 billion in facility maintenance and deferred maintenance costs (Taylor, 2014). Collins (2011) recommended that scholars conduct further research regarding maintenance and facility operations costs and funding to ensure safe and effective teaching learning environments in California community colleges. Strange and Banning (2015) stated that the appearance,

cleanliness, and conditions of the facilities and campus had an effect on employee and student performance. Leaders of these colleges may need operational strategies to find solutions to minimize the effect *general wear and tear,* and deferred maintenance has on mission critical operations (Collins, 2011).

Problem Statement

California community college leaders need strategies and alternatives to sustain or improve facilities to meet the college mission that support over 2 million students (Taylor, 2014). The governor of California only approved the allocation of $87.5 million in the 2014-2015 Budget Act for the community college facilities maintenance operations of 72 districts encompassing 113 colleges, 5,192 buildings, and over 72 million square feet of space (California Community College Chancellor's Office, 2015a). The general business problem facing California community colleges was that CEOs lacked the business strategies to sustain critical maintenance operations needed to meet the mission requirements while maintaining a balanced budget. The specific business problem was that California community college leaders lack business strategies to sustain or improve facilities maintenance operations to meet the college mission.

Purpose Statement

The purpose of this qualitative multicase study was to explore the strategies California community college leaders use to sustain or improve facilities maintenance operations to meet the college mission. The population included senior administrators (chancellors, presidents, vice chancellors, vice presidents of business, facility operations, and executives of facility management and planning) from three large California community

colleges who have used strategies to address sustaining or improving their facility maintenance operations. The research findings may help college CEOs identify specific operational options that might improve overall strategies to sustain or improve facility maintenance operations needed to meet the college missions. Since economic development of communities is now part of the community college mission, sustaining these institutions may help ensure the wellbeing of the communities these colleges support (Cohen & Kisker, 2014) and enhance the social fabricate in these states.

Nature of the Study

Three research methods exist: quantitative, qualitative, and mixed method. I chose the qualitative method for this study because qualitative research allows one to explore deeper processes in individuals, teams, and organizations (Patton, 2015). Qualitative research is important for gaining and understanding how processes develop over time (Patton, 2015). Flick (2014) asserted that researchers who used quantitative methods to test hypotheses through researcher assumptions ignored stakeholders' qualitative input. Researchers should use the mixed method approach to collect, analyze, and interpret data simultaneously that requires both qualitative and quantitative methods (Zohrabi, 2013). I focused the data collection for this study on the interpretation and understanding of people's experiences. I did not focus on scientific, numerical, or examination of hypotheses, nor did I test any measurements or variables. Thus, neither a quantitative nor a mixed method approach was appropriate since neither method would achieve the goals of this study.

Petty, Thomas, and Stew (2012) asserted that there were several main qualitative research designs that include (a) ethnography, (b) phenomenology, and (c) case study. The

chosen qualitative research approach for this study was a case study. Since there were three colleges studied and each college was a single case, this qualifies as a multicase study in accordance with Yin's definition of a case study (2014). Ethnography involves the study and observation of ethnic groups or societies (Denzin & Lincoln, 2011). I did not study any ethnic group or societies, nor their values in the proposed study; hence, an ethnographic design was unsuitable. A phenomenological research design allows the researcher to capture the lived experiences of individuals (Petty et al., 2012). However, the focus of this study was specific to a case study of institutions not the lived experiences of individuals, and therefore a phenomenological design was not appropriate for this study.

Research Question

Yin (2014) specified that the construction and formulation of a central research question is the driving force in conducting case study research. The central research question of this study was: *What strategies do California community college leaders use to sustain or improve facility maintenance operations to meet the college mission?* As Yin (2014) prescribed, the interview questions helped provide understanding into the study and respond to the central research question.

Interview Questions

I concentrated on the exploration of the central research question through the use of interview questions designed to improve the understanding of strategies being affected by community college leaders to sustain or improve college facility maintenance operations. I developed interview questions to extract data from the sample population of participants regarding their perceptions of the strategies they used to sustain or improve facility

maintenance and reduce deferred maintenance at California community colleges. I asked several interview questions to identify any fundamental changes in systemic facility maintenance operations and transformational initiatives of California community college leaders. The purpose of the interview questions allowed the participants to be introspective and think critically. I identified data that may suggest leaders need changes in facility maintenance operations cost reductions and funding changes in three California community colleges.

I used the following interview questions to conduct this research and collect data:

1. What strategies do you use to sustain institutional facility maintenance and reduce deferred maintenance?
2. What strategies do you use to improve institutional facility maintenance and reduce deferred maintenance?
3. What short-term strategies have you implemented for sustaining facilities operations?
4. What strategies failed to sustain institutional facility maintenance and reduce deferred maintenance?
5. What long-term budget strategies have you implemented for facilities operations?
6. What additional information would you like to share that we have not addressed on this topic?

Conceptual Framework

Yin (2014) noted that theory is needed to complete the research framework and design. I selected three theories to create the conceptual framework of this qualitative multicase study (a) Chamberlain's (2011) theory of strategy, (b) Lewin's (1951) change model, and (c) Kotter's (2012) change theory. In addition, theoretical inquiry should allow

one to be relatively modest when making claims about the ideas being studied while inviting consideration of how these ideas may fit into some broader theoretical scheme. These theories were chosen specifically for this qualitative multicase study because of the nature of the research, as well as how the theories apply to the study.

The theory of strategy has four components that Chamberlain (2011) determined are the essence of strategy theory. These four elements are (a) What is strategy? (b) What forces or elements shape strategy? (c) What are the processes that form strategy? and (d) What are the functions or mechanisms that strategies can take effect? (Chamberlain, 2011). Chamberlain (2011) asserted that the researcher should focus on a single topic, this is one of the characteristics of strategy. Each of these theoretical elements was essential to the conceptual framework of this study and I bounded the central research question with the concept of leader strategies.

Strategies create change when leaders develop and implement them. Thus, the theories of change were equally important in grounding this research. I explored strategies used by senior leaders to make positive changes in maintenance operations to fulfill the college mission.

Operational Definitions

Deferred maintenance. Deferred maintenance is a reactive strategy. Leaders decide not to perform repairs when they discover maintenance discrepancy or schedule items for repair (Wahmare, Raut, Mahajan, & Bhamare, 2014). College leaders often delay the repairs or corrective actions to a future date because of the lack of financial resources (Collins, 2011; Taylor, 2014).

Full-time equivalency student (FTES). FTES refers to an enrollment calculation used by California to determine enrollment, resource funding, and determination of facility's usage based on an equation that is derived from multiplying 175 days of instruction times 3 hours of instruction to equal 525 hours, which equals one FTES (California Community College Chancellor's Office, 2015a).

Large California community college. The California Community College Chancellor's Office sets the size of community colleges based on the number of FTES served (California Community College Chancellor's Office, 2015a). The California Community College Chancellor's Office classifies any college that serves more than 20,000 FTES as a large college (California Community College Chancellor's Office, 2015a).

Life cycle costs. Life cycle costs are synonymous with the total cost of ownership of facilities and equipment (Collins, 2011). These costs include acquisition or procurement costs, and costs of operating and maintaining throughout the projected reliable life of the asset (Collins, 2011).

Strategy. Strategy is a plan that when implemented becomes a pattern based on a sequence of leadership decisions (Lampel, Mintzberg, Quinn, & Ghoshal, 2014).

Assumptions, Limitations, and Delimitations

In conducting research, a consideration of implied facts and assumptions are an important part of the research. A researcher should provide the limitations and delimitations to add rigor and identify the factors, biases, and limitations beyond the reach or scope of the research. The following paragraphs contain assumptions, limitations, and delimitations of this study.

Assumptions

Assumptions are statements that one develops regarding the inevitability of contingencies, the significance of a process, and the complexity of phenomenon or issue that helps frame a research project (Yin, 2014). There were three assumptions that I used to frame this qualitative multicase study. The first assumption was that community college leaders in California make decisions about maintenance operations. The second assumption was that all of the maintenance operations of a California community college are part of the college mission. The third assumption was that not all California community college leaders use the same strategies for sustaining and improving maintenance and facilities operations, which suggests there could be value in a multicase study.

Limitations

Limitations are those areas that one has little or no control over in the study and limit the ability of the researcher to generalize (Patton, 2015). In this qualitative multicase study, the primary limitation was the sample size of cases. There are nearly 1,200 national community colleges and California has 113 public two-year community colleges in 72 districts (California Community College Chancellor's Office, 2015a). Only three of the community colleges in California formed the cases for this research. Even though California community colleges account for about 2 million students, about 20% of the total national student population, these institutions might not reflect the whole of community colleges nationally. Since this was a multicase study where not all cases were included, there could be relevant data and information that was not included as part of this research. Additionally, the cases in California might be unique only to the three colleges included in my study.

Delimitations

Denzin and Lincoln (2011) defined the boundaries and limits of the research scope as the study's delimitations. I confined this research to senior administrators (chancellors, presidents, vice chancellors, vice presidents of business, facility operations, and executives of facility management and planning) from three large community colleges in California. The small sample size of community colleges in California limited the ability to create generalizations from the study. Marshall and Rossman (2016) opined that the burden of determining if research is applicable to another context is that of other researchers, not the one who originally conducts the research. The population limits mean that the findings may not apply to other community colleges. Case studies usually do not create the outcomes that allow one to evaluate nor generalize to a larger population (Yin, 2014). I bounded this study by the selection of urban colleges in California.

Significance of the Study

This study was significant because community college leaders who develop effective strategies to sustain or improve maintenance and facilities could affect the teaching and learning mission in a positive manner. These strategies might result in reduced costs and increased revenues through retention of students, positive changes in student outcomes, community economics, and improved college operations (Strange & Banning, 2015). Collins (2011) noted that failure to reduce deferred maintenance could undermine the mission of community colleges.

Contribution to Business Practice

Community college leaders make decisions that affect millions of students and the

economic wellbeing of the communities they serve. California community colleges serve over 2 million students and affect one of the largest economies in the world (California Community College Chancellor's Office, 2015a). With over $1 billion in deferred maintenance and only $87.7 million provided in the 2014-2015 budget for 72 college districts, eroding facilities could negatively affect the mission of California community colleges (Taylor, 2014). There was little information, research, or data on community college leadership strategies used to sustain and improve maintenance and facilities operations in California (Collins, 2011). There were no qualitative studies on California community college maintenance and facilities operations strategies that inform leaders how to sustain and improve maintenance operations (Collins, 2011). The results of this study might fill gaps in the understanding of effective practices of community college strategies that leaders develop and implement regarding maintenance and facility operations.

Implications for Social Change

Community colleges are one of the principle economic engines of the United States and the effects of change on how community colleges do business is a result of how leaders develop and use resources (Hillman & Orians, 2013). If the current skilled workforce trends stay the same, research shows that by 2025, 41% of jobs will require a minimum of a bachelor's degree (Hillman & Orians, 2013; Nickoli, 2013). In addition, research shows that only 35% of working adults will have completed a bachelor's degree by 2025 thus creating a shortfall of a skilled workforce by 1 million college graduates (Hillman & Orians, 2013; Nickoli, 2013). California community colleges should act now to find ways to generate additional revenues and not cut budgets so that colleges can begin addressing the demands of

the economy for the future (Collins, 2011). California community college leaders' fiscal strategies could be the catalyst for economic stability and growth of their communities (Collins).

Improvements to facilities can have a positive effect on college leaders' mission to attract and retain students (Collins, 2011; Strange & Banning, 2015). Attending a community college is one opportunity for the most economically deprived strata of people in the United States to find access to knowledge, skills, and jobs (Bahr, Gross, Slay, & Christensen, 2015; Hillman & Orians, 2013). Local communities created community colleges based on the principles of access to offer hope and to be the portal to opportunity for all people (Cohen & Kisker, 2014). Community college leaders create the education and skill development that has the general effect of enhancing individual life by promoting the worth, dignity, and development of individuals, communities, organizations, institutions, cultures, and societies (Cohen & Kisker, 2014). The transformation of over 2.1 million people in California each year could have a significant effect on society.

A Review of the Professional and Academic Literature

I used the literature review to guide this qualitative multicase study by providing background and information on the history of community colleges in the United States, California community college funding of operations, the conceptual framework of the study, Chamberlain's (2011) strategy theory, Lewin (1951) and Kotter's (2012) change theories, facilities and maintenance operations, and leader strategies. Community colleges educate more than 12 million students in the United States each year (Department of Education, 2015). Community colleges educate a large portion of the workforce, and thus it is critical to

the U.S. economy for community colleges to provide and improve the skills needed for gainful employment (Nickoli, 2013). Legislators continue to reduce funding for California community college facility and maintenance operations while creating benchmarks for new funding models (Collins, 2011; Taylor, 2014). Some CEOs focus strategies and decisions for priorities that sustain and maintain facilities based on the availability of categorical funds (Collins, 2011). The leaders who focus on categorical funding are narrowly constrained by a strategy that has led to the creation of more than $1 billion in deferred maintenance in California community colleges (Taylor, 2014). The learning environment, specifically facility appearance and functionality, has a significant effect on the behavior of employees and the success of students (Strange & Banning, 2015). If California community college leaders continue to rely on a single strategy based on categorical funding from statewide bonds, the facilities could continue to deteriorate and could affect community college operations and their missions negatively (Collins, 2011; Taylor, 2014). Some CEOs adopted changes that sustain or improve the *brick and mortar* teaching learning platforms, which thereby could improve the outcomes of the community college mission. The findings of this study could contribute in laying the foundation for what constitutes best practices in aligning strategies and performance for sustaining or improving facilities and maintenance operations.

In this literature review section of the qualitative multicase study, I explored business strategies some California community college leaders use to sustain or improve facility maintenance operations to meet the college mission. I reviewed the following main topics: (a) history of community colleges in the United States and California, (b) conceptual framework, (c) strategy development and process, and (d) facility maintenance. In order to

provide comprehensive support for the problem statement and research questions, I used scholarly sources such as peer-reviewed journal articles, professional websites, books, reports, editorials, and dissertations. I based the foundation of the study on change and strategy theories to ensure the research has a scholarly conceptual framework.

Having a comprehensive literature review was a vital part of the research process and allowed for scholarly academic proficiency in the study while creating a foundation for the results that I gathered (Patton, 2015). The databases that I used to find peer-reviewed articles and journals included the ERIC website, Dissertations and Theses at Walden University, ProQuest Central, Thoreau, EBSCOhost databases, Google Scholar, and Community College Review. In addition, other online searches included various online journal websites, American Association of Community Colleges, and Community College League of California. The title searches and phrases used in Boolean searches were *community colleges, facilities, deferred maintenance, maintenance, systems, leadership, strategy, strategy process, change, change management, total productive maintenance, TPM, preventative maintenance, life-cycle, life-cycle costs of equipment, life-cycle costs of facilities, higher education,* and *California community college budget allocation for maintenance*

The literature review contains 60 peer-reviewed references out of 69, which equals 86%. There were 59 out of 69 references less than 5 years old, which equals 85%. There were 112 out of 122 total references in the proposal published since 2012, which means 92% were less than 5 years of the anticipated study approval date. There were 110 peer-reviewed references out of 122 total references. Thus, 90% of the references were peer-reviewed.

History of United States Community Colleges

History provides the background and context of a subject. The history of community colleges could help create the understanding of this research for individuals who do not have a background in U.S. community colleges. The development of community colleges in the United States has grown significantly to become a vast enterprise within the higher education model (Cohen & Kisker, 2014). Community colleges, for many years, have provided the education needed to meet the needs of the U.S. economic environment (American Association of Community Colleges, 2015). Community colleges educate more than 12 million students in the United States each year (Department of Education, 2015). Community colleges are at the forefront of the educational landscape; they receive much attention from key figures and the press and play a vital role in postsecondary education (American Association of Community Colleges, 2015).

Higher education in the United States emerged in the early 1600s when a few young men arrived in Cambridge, Massachusetts with the dream of creating the nation's first college (Cohen & Kisker, 2014). The transformation of higher education continued over the next two centuries at a slow pace with enrollment and participation generally limited to the wealthy elite (Cohen & Kisker). The 13th Amendment, passed in January 1865, prohibited slavery and involuntary servitude, except when the person had been convicted and given servitude as punishment, within the United States (Finkelman, 2014). Even with the passing of this amendment, the African American population could not fully participate in the higher education process, especially in the South (Finkelman, 2014). The advent of community colleges in 1906 helped change these exclusionary practices (Cohen & Kisker, 2014). The

evolution of the U.S. higher education system, which in 2013 encompassed more than 4,500 different colleges, 20 million students, 1.4 million faculty members, and educational expenditures surpassing 400 billion dollars per year took over 400 years (Cohen & Kisker, 2014). Cohen and Kisker noted that community colleges represented more than 50% of the undergraduates. The 400-year transformation of higher education and the role of community colleges changed America's supply of educated workers and the U.S. economy (Cohen & Kisker).

Historians contend the term *community college* was adopted as colleges began to multiply and their missions began to expand to include more community based needs education; not just provide instruction in general, adult, and vocational education (Cohen & Kisker, 2014). The array of community college varied between states, municipalities, religious denominations, and organized communities as some community colleges are designed specifically for various disciplines, racial and ethnic groups, or women (Cohen & Kisker, 2014). Also, community colleges may be public, private, or proprietary and offer various degrees and certificates in academics, technical education, professional, and vocational certificates (Cohen & Kisker, 2014).

Leaders transformed higher education and initiated development of community colleges because of three critical actions:

- *Brown v. Board of Education* Supreme Court decision, making *separate but equal* education facilities illegal (U.S. Courts, 2015).
- The Civil Rights Act of 1964 which allowed everyone use of public facilities and ended segregation in schools (Epstein, 2014).

- The 1965 Higher Education Act (HEA) (Epstein, 2014).

The HEA promoted education as the vehicle for economic growth and development, and provided federal student loan and scholarship programs (Epstein, 2014). The states created the majority of community college facilities after 1965 (Cohen & Kisker, 2014; Crookston & Hooks, 2012). Ultimately, local community colleges grew to nearly 1200 institutions that serve about 12 million people in large part due to federal support and changes in civil rights laws (Cohen & Kisker).

Community colleges play a vital role in connecting with the K-12 systems that allows students opportunities that did not exist in the past (Officer, Grim, Medina, Bringle, & Foreman, 2013). Community colleges provide students who might not otherwise be ready to attend a university an opportunity to complete remedial courses, enhancing their educational career pathway (Watkins & Marsick, 2014). Equally important is the role community colleges perform in developing global citizens and international competencies through study abroad programs and facilitating international student admissions to ensure students are preparing to work in the 21st century economy (LeBeau, 2012; Muenich & Williams, 2013; Spangler & Tyler, 2011). Community college leaders therefore should recognize the importance of developing an environment that affords all students, local and international, with an atmosphere that supports cultural diversity (Spangler & Tyler).

In 2014, community colleges educated over 40% of the higher education population or over 11 million students (Cohen & Kisker, 2014). Community colleges educated more than 60% of all U.S. undergraduates in public institutions and trained more than 80% of all first responders that includes firefighters, EMTs, nurses, and police officers (Cohen &

Kisker, 2014). Community colleges also played another critical role in educating older students or those that wanted to study a new career; at a reduced cost compared to a 4-year institution (Muenich & Williams, 2013).

California Community Colleges

The California community college system is the largest system in higher education in the United States with 113 community colleges (California Community College Chancellor's Office, 2014a). California community colleges educate about 20% of all U.S. community college students (Department of Education, 2015). Similar to other community college systems, California has experienced its share of budget cuts because of the economic downturn (California Community College Chancellor's Office, 2014a; Hillman & Orians, 2013; U.S. Department of Labor, Bureau of Labor Statistics, 2013). In 2009-10, California community colleges educated more than 2.4 million students, which dropped to 2.1 million in 2011-12 (California Community College Chancellor's Office, 2013; California Community College Chancellor Office, 2014a). Community college leaders asserted that reductions in funding was the primary cause of the 2011-12 enrollment drop (Boerner, 2012; California Community College Chancellor's Office, 2013).

Community college funding factors play a critical role in the process of college leader strategies and priority selection in California (Collins, 2011). As college costs continue to increase and funding declines, community college leaders were neglecting maintenance of facilities (Collins, 2011; Taylor, 2014). Students have many options when choosing a college and often make their selection based on their perception of the facilities and environment of the campus, which can improve or hurt enrollment and funding (Strange & Banning, 2015).

The economic recession has forced many universities to increase tuition, which has created an overflow effect of more students having to attend a community college. Many educational leaders' decisions negatively affected students because of the recession outcome throughout the nation, but California college students have suffered the most (Boerner, 2012). Between 2008 and 2011, community college leaders in California turned away more than 300,000 students because of the lack of financial capability (Boerner, 2012). At the same time colleges were turning students away, California community college leaders were reducing funding for maintenance operations and deferring maintenance of facilities (Collins, 2011; Taylor, 2014). Collins asserted community college leaders primary reason for maintenance and facility decisions was lack of funding.

California community college leaders responded to the financial crisis with strategies that simply cut allocations of resources to nonacademic operations, especially facility maintenance, and deferred maintenance until state categorical funding would be available (Collins, 2011). The emphasis on community colleges is a centerpiece of national leadership strategies to improve and enhance the U.S. economy and academic leadership in the global economy (The White House, 2015). However, over the last few decades more and more community college leaders have deferred or neglected the facilities, maintenance operations, and infrastructure of learning environments (Taylor, 2014).

California community college leaders had deferred maintenance costs that Taylor (2014) estimated to be about $1 billion. Given the critical need for teaching and learning facilities at community college to sustain the mission's operational requirements, community college leaders must find new business strategies to sustain their mission and operations

(Collins, 2011). California community college leaders were looking for strategies to sustain or improve facility needs to meet the college mission (Collins, 2011).

Funding Issues in California Community Colleges

Cohen and Kisker (2014) reported that although community colleges are public institutions of higher education in the United States, financing for these institutions occur in different ways. Generally, student tuition and fees are low at community colleges as compared to other segments of higher education (Cohen & Kisker, 2014). Community college leaders sometimes receive state funding and through local taxation for college operations and programs. Funding for community colleges in California consists of state general funds, local, student fees, lottery funds, and state school funds (Collins, 2011). In the last 40 years, community college enrollment has increased at a steady pace, while state and local appropriations have decreased (Romano, 2012). This imbalance between enrollment growth and funding reductions create a challenge for most community college leaders while creating a need for new funding sources. Community college leaders have the dilemma of trying to meet the demand of student desired courses and programs while they have inadequate resources to meet this demand (Deming, Goldin, & Katz, 2013). Skari (2014) recommended community college leaders use fundraising as a strategy to supplement funding challenges. McLendon, Tandberg, and Hillman (2014) concluded college leaders should find additional new strategies to increase funding without increasing the cost to students. McLendon and Hearn (2013) noted that higher educational leaders should create a sustainable funding model for the support operations of their institutions.

To understand why California college leaders are constrained in strategy development and implementation for facility operations and maintenance, one must recognize the effect that two laws have had on decision making. The first of these laws is the *Fifty Percent Law* (Community College: Salaries of Classroom Instructors – 2013-2014 Act, 2013). This law required that all school budgets spend more than 50% of their funding on instructional costs, which only include academic instruction or faculty expenses (California Community Colleges Chancellor's Office, 2014b; Collins, 2011; Community College: Salaries of Classroom Instructors – 2013-2014 Act, 2013;). The California legislature enacted this funding to promote the hiring of more teachers and reduce student classroom size (Community College: Salaries of Classroom Instructors – 2013-2014 Act, 2013). Lawmakers had good intentions when they enacted the Fifty Percent Law in 1961; however, in the 21st century higher education environment, leaders view this law as outdated and in many cases contrary to sustain operational strategies for facilities (Collins, 2011; Van Hook, 2014). Technology has taken center stage in both instruction and operations of community college campuses (Roby, Ashe, Singh & Clark, 2013). Online courses have opened many opportunities for students who might not otherwise have an opportunity to attend college (Roby et al., 2013). In 2011-12, nearly 700,000 of the 2.1 million students had taken at least one online course (California Community College Chancellor's Office, 2015a).

The legislature used a formula based on a full-time equivalent student (FTES) to fund community colleges in California (California Community Colleges Chancellor's Office, 2014b). With more and more *smart* classrooms in community colleges, the Fifty Percent Law requires a leader to match every dollar spent on computers, facilities, librarian, and

counselors, with an equal amount on academic faculty, even if it is not needed (California Community Colleges Chancellor's Office, 2013; California Community Colleges Chancellor's Office, 2014b). Thus, California community college leaders do not have control of financial decision making and cannot always respond to facility priorities using general fund resources.

AB1725 is the other adopted law that affects leader strategy development and implementation. AB1725 mandates stakeholder participation in planning and institutional governance (Van Hook, 2014). The legislators granted students, faculty, and staff the right to participate in college governance by making recommendations in the specific areas of academics, curriculum standards, strategic planning, and budget development that leaders should implement (California Community College Chancellor's Office, 2015a; Collins, 2011; Van Hook, 2014). Furthermore, the legal language in AB1725 contradicts the intent of the Fifty Percent Law. Legislators gave faculty members the right to have additional workloads outside of the classroom as part of AB1725; thus making community college leaders fund these additional expenses (Van Hook, 2014).

California community college operations funding has significantly decreased in the last 10 years (Collins, 2011). Governor Brown's compromise on the Fiscal Year (FY) 15-16 budget diminished categorical funding for facility operations and maintenance (Brown, 2015). However, the Governor Brown's new budget created performance based funding that total $285,183,000 in *Student Success and Support* funding and $155,000,000 in *Student Equity* funding (Brown, 2015; California Community Colleges Chancellor's Office, 2014c; D'Amico, Friedel, Katsinas, & Thornton, 2014).

California community college leaders could face more challenges in developing and implementing facility and maintenance strategies because performance based funding further affects the requirements of the Fifty Percent Law. Collins (2011) noted that as allocations from the state become more restricted or reduced, California community college leaders tend to reduce the resources needed to sustain, improve, or maintain facilities and maintenance operations. Although Collins (2011) initially stated the research would include maintenance and facility strategies for leaders, Collins only focused on costs and expenditures for facility and maintenance operations as a strategic component of college finance. The creation of these new funding allocations may have negatively affected facilities and maintenance operations.

Conceptual Framework of the Study

Flick (2015) stated that in qualitative research, the researcher might use several theories to create the framework of the study. Flick further asserted that in qualitative studies researchers should select theories related to the topic and focus of the study. In this study, I focused on the practical matter of what leaders of community colleges have done, not on why or how they made their decisions. Leaders create and implement strategies that transform and produce change. Thus, I used the theories of strategy and change to create the conceptual framework for this study. I wanted to evaluate the responses of leaders regarding their actions to develop and implement strategies that sustain or improve facility operations and maintenance.

Strategy Theory and Application to the Study

Strategy development and implementation takes on several different constructs depending upon the situation (Mintzberg, 2007). Mintzberg (2007) concluded from his research that one could define strategy as a series of decisions that leaders create as a pattern and *realize* in the actions. Mintzberg categorized strategies into two groups of definitions based on the *concept of process* and *constructs of content*. Mintzberg defined the concept of process as plans or patterns. Mintzberg defined the constructs of content as perspectives and positions. Mintzberg recognized that these varying definitions were espoused by other scholars like (a) Drucker (2015), who preferred to define strategy as leader *perspectives* focused on the development of strategic visioning based on a theory of business where strategy was a tool of leaders, and (b) Porter (2007), who characterized strategy as a *position* focused on competitive advantages. Mintzberg opined that both definitions were correct dependent on the situation. Mintzberg further concluded that there were four processes of strategy formation and development abased on an understanding that some leaders focus planning on controlled processes (*deliberate strategy*) and other leaders focus on learning (*emergent strategy*). The four processes defined by Mintzberg were (a) *strategic planning* - a function of deliberate plans about tangible positions leaders take, (b) *strategic visioning* - a function of deliberate plans that form a broad business perspective, (c) *strategic venturing* - patterns that manifest themselves as tangible positions, and (d) *strategic learning* - patterns that result in a broad perspective based on learning. Mintzberg created a matrix to depict these concepts as displayed in Figure 1.

	Deliberate Plan	Emergent Patterns
Tangible Positions	Strategic Planning	Strategic Venturing
Broad Perspective	Strategic Visioning	Strategic Learning

Figure 1. Four process of strategy formation developed by Mintzberg (2007).

The theory of strategy as developed by Chamberlain (2011) emanated from the work of scholars like Chandler, Andrews, Mintzberg, and Quinn. Chamberlain (2011) determined that the essence of strategy theory is based on four elements (a) What is strategy? (b) What forces or elements shape strategy? (c) What are the processes that form strategy? and (d) What are the functions or mechanisms that strategies can take effect? These theoretical elements create fabric of the conceptual framework for this multicase study. I used the concept of leader strategies to frame the central research question. Chamberlain (2011) noted that one of the characteristics of strategy is it should be focused and bounded on a single topic. I focused this study on facility operations and maintenance.

I explored strategies used by senior leaders to make positive changes in maintenance operations to fulfill the college mission. Leaders create change when they implement strategies they have developed. Chamberlain (2011) noted that strategists used two psychological elements to inform their decisions. Whether or not the strategist is receptive toward major change is the first element. Chamberlain called this *change-readiness*, which is a factor of cognitive style. Chamberlain's second element is motivation, which was termed

cognitive emphasis. External and internal influencers who use their power to affect the decisions leaders make are called motivators. Thus, the theories of change were equally as important as the theory of strategy in grounding this research.

Kotter and Lewin's Change Theory and Application to the Study

Theory is used as a principle for understanding behaviors, attitudes, ideals, or hypothetical situations. I used Kotter's (2012) change model and Lewin's (1951) change theory to create the conceptual framework of this qualitative multicase study. I selected these theories of change specifically for this qualitative multicase study because of the nature of the research as well as how the theories apply to the study.

Senior community college leaders' development and implementation of facility operation and maintenance strategies create change. Change in community college leader decision making strategies could occur because of increased deferred maintenance requirements and reduced allocations of resources. Increased deferred maintenance could undermine the learning environment for students and negatively affect the college mission (Collins, 2011). Understanding how and why leaders make decisions and the effect on college facility and maintenance operations could provide insight into best practices for reacting to this change.

California community college leaders should use principles in theories of change as guides to create smooth transformations in their organizations. Change theory has a direct application to this study because California community college institutions must find ways and implement strategies to overcome a $1 billion shortfall in deferred maintenance. I

explored senior leaders' strategies to understand the effectiveness of their implemented changes.

Lewin's Change Model. Lewin argued that successful organizations approach managing organizational change in three steps: unfreezing the status quo, movement to a desired end state, and refreezing the new change to make it permanent (Lewin, 1951). Lewin (1951) opined there were three phases of change: (a) *Unfreezing* – changing to overcome the pressures of both the individual resistance and group conformity, (b) *Movement* – a change process that transforms the organization from the status quo to a desired end state, (c) *Refreezing* – stabilizing a change intervention by balancing, driving, and restraining forces. Lewin's change theory has a direct application to the proposed study because California community college leaders must find strategies to reduce the deferred maintenance costs, sustain facitlies operations or improve them. Lewin invented new ways to view human situations; he proposed that adults learn, and keep learning new ways of thinking throughout their lives. I used the seminal concepts of Lewin's model as the essential concept to explore community college leaders' strategies that create change in facility operations and maintenance to sustain and improve the college mission.

Kotter's 8-step plan for implementing change. The second model I used was Kotter's (2012) 8-step model for implementing organizational change. Kotter defined the steps leaders should take when implementing organizational change. Kotter (2012) described these steps as (a) establishing a sense of urgency by creating a compelling reason for why change is needed, (b) forming a coalition with enough power to lead the change, (c) creating a new vision to direct the change and creating strategies to achieve the vision, (d)

communicating the vision throughout the organization, (e) empowering others to act on the vision by removing barriers to change and encouraging risk taking and creative problem solving, (f) planning for, creating, and rewarding short-term *wins* that move the organization toward the new vision; (g) consolidating improvements, reassessing changes, and making necessary adjustments in the new programs, and (h) reinforcing the changes by demonstrating the relationship between new behaviors and organizational success. Unlike some other change models, including Lewin's model, Kotter's 8-stage model provides a detailed structure to examine the process of change. However, the precepts of Lewin's model are a fundamental or seminal theory of change.

An integrated change model. In community colleges, the driving force is the mission. What sets community colleges apart from the rest of higher education is the institutional commitment to create access, especially for underrepresented and economically deprived students (Cohen & Kisker, 2014). However, the restraining force for the mission success is funding (Ahmad, Farley, & Naidoo, 2012; Cohen & Kisker, 2014). Collins (2011) noted that allocation of college funds is a critical factor in leader determination of what strategies they would employ to sustain facilities operations and maintenance efforts at California community colleges. The millions of dollars that increase the amount of deferred maintenance is a consequence of the lack of viable strategies and the inability of leaders to resolve funding isssues for the college mission priorities (Collins, 2011). Collins (2011) opined that in California community colleges, equilibrium is synonymous with a balance between the budgets, success criteria to maximize funding, and minimizing the cost of operations that maximize support of specific communities.

Community college leaders who implement strategies to sustain or improve facility operations and maintenance require change but the process Lewin described may be to simplistic to capture the steps in the actual process. I believe the integration of the Lewin and Kotter models was required to understand the behavior that California community college leaders might undergo. I provided a merger of the models in Figure 2 that indicates the integrated concepts of change I used the integrated change model to frame and analyze the facility operations and maintenance strategy changes in California community colleges. Based on the theories of Lewin and Kotter this denotes a model of change process in human systems (Kotter, 2012; Lewin, 1951). Therefore, California community college leaders could change their strategies regarding day-to-day operations of community colleges. These new strategies could become a new model for facilities operations and maintenance to support transformations in California community colleges.

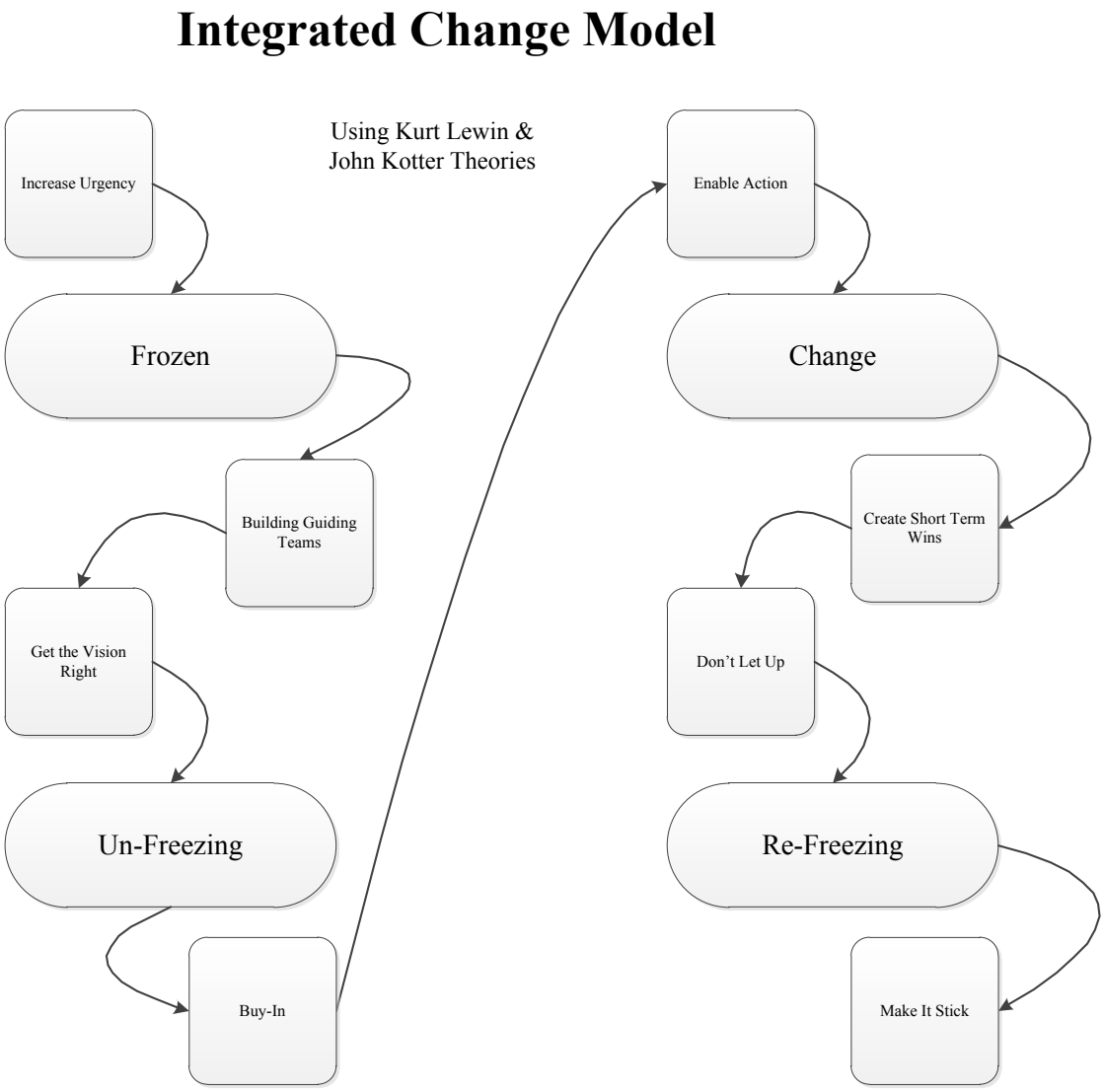

Figure 2. Integrated change model adapted from Lewin (1951) and Kotter (2012).

Burnes and Cooke (2013) explored the relevance of Lewin's theory on change, especially since much of Lewin's work took place during or just after World War II. Burnes and Cooke reviewed Lewin's work using mathematical concepts and determined Lewin's theory was flawed. However, Burnes and Cooke concluded that Lewin's original concepts

were still valuable and an essential theory to the approach of managing change. Therefore, I selected Lewin's original theoretical constructs to integrate with Kotter's model.

Appelbaum, Habashy, Malo, and Shafiq (2012) reviewed the work of Kotter and discussed the agreements and counterarguments of his change theory. Applebaum et al. reviewed 15 years of literature to determine which steps in Kotter's model were valid and supported by research. They opined that Kotter supported most of the steps, but not all of the steps, by practical application but not scientific research. Appelbaum et al. asserted that some decisions for change, as if new replacement of software versions did not require steps 7 and 8 of Kotter's model. Appelbaum et al. found that some of the management projects were too complex to document the use of the Kotter model. Despite the lack of scientific research, Appelbaum et al. concluded the Kotter model is relevant in business change since it provides a framework for practical application even if one does not use all of the eight steps.

One might also consider using some of the theories of leadership decision making. I rejected the Vroom-Yetton-Jago decision making model of leadership (Vroom & Jago, 2007). The Vroom-Yetton-Jago model focuses on how leaders make decisions, and examine the various factors that attempt to make leader decisions objective and the model discounts the influence of emotions. Vroom, Yetton, and Jago originally tried to create an inclusive model of all leadership styles and types; however, their model is a contingency or situational leadership model (Vroom & Jago, 2007). Although somewhat related, none of the discussed leadership theories or decision making models fit the proposed study as well as Chamberlain's (2011) theory on strategy or the theories of change.

I decided not to use stakeholder theory and systems theory, as part of the conceptual framework; however, these theories could be very important to understand the dynamics within California community colleges. Each of these theories provides a partial explanation of how leaders develop strategies in California community colleges and how the implementation by leaders may or may not be affected. Thus, I reviewed stakeholder and systems theories to help provide a more complete understanding of the challenges leaders in California community colleges have regarding sustaining or improving facilities operations and how leaders should connect these strategies to the mission.

Stakeholder Theory

Stakeholder theory is another possible conceptual framework for this study since Chamberlain (2011) claimed that external and internal motivators could influence strategists. Internal motivators include individuals within the organization such as employees, owners, and board of directors, while external motivators include customers, government regulations, legislators, competitors, suppliers and distribution chains, opinion-leaders, and critics. Chamberlain asserted that there is a third group, stakeholders, who are a combination of some external and internal motivators who specifically benefit or control the organization.

Freeman (1984) is widely acknowledged as the developer of the seminal work of stakeholder theory. Freeman argued that there were parties, employees, customers, unions, communities, etc., besides the owners and leaders of an organization who have a valued interest in the decisions and actions of the organization. Mary Parker Follett may have been the first to acknowledge that leaders are imbued with trust from those stakeholders they serve

(Gibson, Chen, Henry, Humphreys, & Lian, 2013). Almost 100 years ago, Follett foresaw the need for stakeholder participation in decision making (Gibson et al., 2013).

Miles (2014) examined the various definitions of stakeholders' theory and concluded the theory was an amalgamation of several narrative terms, reflective of who could be defined a person of interest in a given decision or action. Miles asserted that the lack of definition of the term stakeholder led to a weakness in this theory, which was also the principle strength of the theory and thus created a paradox because of its vagueness and ambiguity. Miles described stakeholder theory definitions as contested concepts regarding the individuals or group who can affect or influence decisions within an organization.

California community college leaders are legally required to engage in participatory governance, which means leaders must include college internal stakeholders (faculty, staff, and students) in their decision making process. The California legislature made participation in the governance structure of community college a legal mandate in 1988 (California Community College Chancellor's Office, 2013). Legislators specified strategic planning in California Assembly Bill 1725 (AB1725) as one of the items that is under the purview of the college academic senates (California Community College Chancellor's Office, 2015a). However, strategic planning is different from strategy development and implementation (Chamberlain, 2011; Mintzberg, 2007). Thus, although I discussed stakeholder theory as it pertains to participatory governance and leader decision making, it was used as a secondary theory to create the conceptual framework for this study because I agree with Miles (2014); stakeholder theory is ambiguous.

The 21st century leader cannot operate as their 19th and 20th century business predecessors did (Bennis, 2015). Leader decision making, strategy development, and behaviors are different in the 21st century because of the effects of Enron, the Internet, globalization, and advent of the knowledge worker (Bennis, 2015). However, in addition to all of those transformational events, the California legislature transformed community college leadership, decision making, and governance when they made AB1725, participatory governance, mandatory (Collins, 2011). Leaders of California community colleges must include stakeholders in the decision making process, especially in the planning and budget allocation processes to meet the tenants of the law.

Systems Theory

The human being is the most complex living organism. The complexity becomes even more challenging when one tries to understand the dynamics of multiple human beings interacting as a team, which tries to integrate them as a larger unique system known as an organization or institution. Community colleges are large organizations, public and private, and thus a community college is a system.

von Bertalanffy (1968) described the phenomenon of a system and used the term *organization* to refer to the structure of a singular living thing or organism. When humans united under a common purpose, a larger system is developed and the term organization takes on a meaning synonymous with the boundaries that define this new system (von Bertalanffy, 1968). von Bertalanffy stated that systems analysis of a business organization includes people, equipment, facilities, materials, logistics, sales, good and other things to provide definite solutions and practical strategies.

Senge, Hamilton, and Kania (2015) suggested that a new paradigm of thinking and understanding was required for the discipline of systems thinking. Senge et al. (2015) believed by changing how leaders see the interactions of people in organizations who share the vision and share understandings would allow actionable transformation to occur in organizations. Senge et al. defined *system leaders* as individual who have the capacity to bring together diverse fractions of people to face and solve common challenges. System leaders create a space that allows others to guide the pathways of change (Senge et al., 2015). System leaders must have a strategy but allow others to create the energy needed to create effective change (Senge et al., 2015). Senge et al. (2015) discussed how and why system leaders are more effective strategists and change agents than other leaders.

I was not trying to create an understanding of how or why leaders create strategies. Rather, I wanted to know what strategies were developed and what practices were occurring. Thus, I grounded the conceptual framework using Chamberlain's theory of strategy and an integration of Lewin's and Kotter's models of change.

California Community College Facility Operations and Maintenance

Throughout the history of community colleges, facilities have been synonymous with the teaching-learning environment for students and faculty (Strange & Banning, 2015). The college campus creates the space that can change the behavior of students, faculty, and staff (Strange & Banning, 2015). Most community colleges in California created the major elements of college campuses and expanded in the 1960s and 1970s (Cohen & Kisker, 2014). In 2014, California community colleges consisted of 24,000 acres, 5,400 buildings, and leaders spent over $7 billion in operational funding (Taylor, 2014). In California, community

college leaders are required to spend at least 50% of all allocated operational funds on instruction, which does not include student services, administration, construction, maintenance, or facilities operations (Collins, 2011; Van Hook, 2014).

Facility operations within the community college domain include (a) the cleaning, maintaining, restoration, minor construction, and (b) improvement of the physical space where people work and learn. Collins (2011) claimed that maintenance and operations in California community colleges included (a) building maintenance and repairs, (b) custodial services, (c) grounds maintenance and repairs, (d) utilities, and (e) other maintenance plant and equipment repairs that were not accounted for in any other activity fund. Collins' (2011) discussion of facilities operations and maintenance focused on how the state funded these activities rather than how leaders created sustainable strategies and plans to ensure leaders sustained physical plants.

Taylor (2015) described routine maintenance as activities necessary to sustain facility conditions in *good condition* or proper working order. Within this routine framework, Taylor (2015) included both preventative maintenance and corrective maintenance. Examples of routine maintenance included inspections of roofs, heating ventilation and air conditioning (HVAC) systems, and minor repairs (Taylor, 2015). Routine maintenance and larger repairs become deferred maintenance when leaders elect not to do repairs when required or when scheduled (Taylor, 2015).

Taylor (2015) noted that when leaders defer repairs or scheduled maintenance it undermines systems and shortens facility life spans. Another critical challenge for leaders is the cost of deferred maintenance becomes significantly higher in the future (Taylor, 2015).

Taylor stated that in some critical HVAC systems such as boilers and chillers, future costs of repairs could rise above 500%.

Prior to the passage of Proposition 13, *People's Initiative to Limit Property Taxation*, community college leaders were able to fund capital projects and construction from property taxes or from local bond measures (Collins, 2011). However, after the California legislature passed Proposition 13, community college leaders lost this ability and had to rely on categorical funds provided from statewide bonds (Collins, 2011). California passed Proposition 98 and created the formula based on attendance of students for the majority of unrestricted general revenues for unified schools and community colleges known as the *Prop 98 split* (Collins, 2011; Legislative Analyst's Office, 2015a).

California governors were reluctant to approve statewide bonds because of various economic downturns in California, which led to increased deferrals of major maintenance projects (Collins, 2011; Taylor, 2014). In November 2000, Californians passed Proposition 39, which lowered the voter approval of school and local community college bond to 55% of the popular vote (California Community College Chancellor's Office, 2015a; Collins, 2011). The passage of this proposition improved the ability of community college leaders to create new opportunities to sustain or improve facilities. However, leaders could not use local bonds for the support of maintenance operations such as custodial services, scheduled maintenance, and general security (Collins, 2011). The Legislative Analyst's Office (LAO) (2015b) noted that even though Proposition 39 helps education institutions pass bonds, districts only do so periodically; however, facility operations and maintenance are an ongoing annual expense. The lack of ongoing revenue to support repairs, scheduled

maintenance, maintenance operations, and upkeep is the source of uncertainty in planning for California districts (Legislative Analyst's Office, 2015b). In 2015, the LAO made recommendations to the California Assembly Budget Subcommittee No. 2 on Education Finance to revise how school administrators must sustain K-12 school facilities (Legislative Analyst's Office, 2015b). However, the LAO did not make any recommendations concerning how community college leaders might sustain facility operations and cover maintenance expenses.

The legislature provided $87.5 million (one-time categorical funds) for California community college facility maintenance, instructional equipment replacement, and library materials in the 2014 budget (Taylor, 2014). Community college leaders must match these funds dollar for dollar in order to receive these funds (California Community College Chancellor's Office, 2015a; Collins, 2011; Taylor, 2014). In the 2015 budget, the legislature increased the funding for California community college facility maintenance, instructional equipment replacement, and library materials to $148 million (Legislative Analyst's Office, 2015a). Given the going deferred maintenance requirements of California community colleges and existing requirements of over $1 billion, it would take more than six years to fund the current maintenance deferrals. These deferred facilities projects have grown by 40% since the early 2000s (Taylor, 2014). Taylor (2014) stated that "despite the importance in supporting California community colleges' educational mission, maintenance generally has been viewed by both the state and districts as a lower priority than other California community college programs" (p. 15). Collins' research supported Taylor's claim.

Gopalakrishnan, Bokrantz, Ylipaa, and Skoogh (2015) concluded that although some leaders prioritize their maintenance needs, few business leaders create this prioritization based on what is critical to their productivity and success. Similarly, community college leaders have not tied facilities operations and maintenance strategies to the implications of return on investments (ROI); thus, the consequence has been to inappropriately analyze the requirement of direct funding and allocation for maintenance and repairs within strained college budgets (Collins, 2011). Ahmad et al. (2012) recognized that leaders in higher education should find new strategies because of the financial challenges of underfunding for operational functions at colleges. Participatory governance in California community college is another motivator that focuses a leader's attention on other operational priorities, which during years of budgetary constraints undermines the ability of leaders to maintain the facilities (Collins, 2011).

Carnero (2014) stated until the last decade, business leaders had not considered maintenance as an important factor in the productivity and competitive advantage of an organization. Many business and industry leaders consider maintenance and facility operations a cost center that they must contain or reduce to improve the profit margins and have elected to implement *reactive strategies* (Swanson, 2001). These reactive strategies, fixing things only after the equipment fail, break, or become dysfunctional, can lead to other costly actions (Albarkoly & Park, 2015). Swanson (2001) described reactive maintenance as a firefighting approach where leaders could delay maintenance and repairs until they can make permanent repairs. This delay or deferred maintenance increases costs and uncertainty in other operations (Swanson, 2001).

The second form of maintenance and facility operations strategy is *proactive* or *preventative* in nature. Leaders who use proactive or preventative maintenance strategies plan and use data, like *mean-time to failure*, monitor equipment, and plant infrastructure to reduce deterioration (Au-Yong, Ali, & Ahmad, 2014; Swanson, 2001). The preventative maintenance approach is a *use-based* strategy where leaders use longitudinal data of facility systems and equipment to determine when is the optimum time to change or replenish something prior to a failure (Swanson, 2001). Planned preventative maintenance (PPM) consists of four groups: preventative maintenance, breakdown maintenance, corrective maintenance, and maintenance prevention (Rahman, Hoque, & Uddin, 2014). Preventative maintenance includes corrosion control, lubrication, cleaning, and changing components, in a timed sequence based on the predetermined schedule for a specific component (Au-Yong et al., 2014). Au-Yong et al. claimed that in a case study of preventative maintenance of office buildings that optimal performance could improve customer satisfaction. Customers in this case study were the users of the building.

The third strategy identified by Swanson (2001) was *aggressive maintenance.* Aggressive maintenance refers to a strategy that does not just focus on avoidance of failures in equipment and facility systems. *Total productive maintenance* (TPM) is one form of an aggressive strategy (Piechnicki, Sola, & Trojan, 2015). TPM is a strategy developed in Japan to support just-in-time manufacturing operations (Piechnicki, Sola, & Trojan, 2015; Swanson, 2001). TPM, while difficult to implement, is an advanced method of calculating the effectiveness of production facilities used by managers to analyze barriers and challenges of maintenance and operations (Attri, Grover, & Dev, 2013). A major factor in implementing

this type of strategy includes two key components – human orientated and process orientated strategies (Bhalerao, Kale, Bhalerao, & Mahire, 2014). The human oriented component may be the more difficult of the two components for managers to implement because it requires change (Attri et al., 2013; Bhalerao et al., 2014). Knowing the barriers, allows managers to implement strategies that have positive effects on maintenance operations (Attri et al., 2013).

Institutional leaders in the 21st century should maintain and possess both efficient maintenance and effective manufacturing strategies, which combine both maintenance and performance functions to provide a quality product (Attri, Grover, Dev, & Kumar, 2013). Organizational leaders should evaluate and plan properly for maintenance costs as these costs can make a positive or negative impact on the organization and its end users (Jain, Bhatti, & Singh, 2014). Ever changing organizational demands are adding a sense of urgency for institutional leaders to find strategies for reducing the costs of maintenance while continuing to provide dynamic mission outcomes (Jain et al., 2014). Prior to 1980, organizational leaders had done little to implement maintenance strategies based on reducing the cost of sustaining equipment (Rahman et al., 2014). In many cases, organizations purchase new equipment at a high cost with no strategy on how to maintain the equipment and/or evaluate the output (Rahman et al., 2014). Some scholars consider TPM as more than a key operational activity (Jain et al., 2014; Rahman et al., 2014). Rahman et al. stated TPM is a maintenance philosophy that sets a life cycle approach to maintaining equipment.

There are other tools available to community college leaders used by other business and manufacturing industry leaders to help analyze and mitigate the risk of equipment and facility failures. For example, Failure Mode and Effect Analysis (FMEA) evolved from the

aerospace industry in the 1960s and helps leaders (a) identify potential equipment failure, (b) identify potential effects of design deficiencies, (c) access process controls, and (d) determine risk priorities attributed to failures (Wahmare et al., 2014). Wahmare et al. claimed that when FMEA concepts are combined with the *8 Pillars of TPM*, leaders can improve the performance and extend the life-cycle of equipment and mechanical systems. The 8 Pillars of TPM are (a) facilities and equipment must be clean and organized, (b) autonomous maintenance, (c) continuous improvement, (d) planned maintenance, (e) quality maintenance, (f) education and training, (g) office TPM, and (h) safety, hygiene, and environmental control (Wahmare et al.).

Facilities and equipment should be clean, standardize, and well organized so operations staff can identify problems easily and quickly. Wahmare et al. (2014) described autonomous maintenance as the ability of operators and staff to care for equipment and fix minor problems thereby freeing skilled maintenance technicians to resolve major issues. Continuous improvement within this context stems from the Japanese concept of *Kaizen*. *Kai* meaning change and *Zen* meaning good. Together the Kaizen pillar stands for a concept that includes everyone in the organization working continuously to improve the facility and the environment (Wahmare et al.).

Wahmare et al. (2014) described planned maintenance as a pillar of TPM that includes preventative maintenance (regularly scheduled maintenance), corrective maintenance (recalibrations and adjustments), maintenance prevention (lubrication, time-change of parts, corrosion control, etc.), and breakdown maintenance (timely repairs). Quality maintenance is the fifth pillar of TPM and leaders should create processes that

include training of staff to sustain the highest quality of defect-free systems, which improves customer satisfaction (Wahmare et al.). Leaders should design and implement education and training of all staff to improve morale and skills, and ensure the highest quality of work (Wahmare et al.). The pillar of office TPM encompasses all of the administrative and support functions of maintenance including processes and procedures (Wahmare et al.).

Wahmare et al. (2014) stressed that leaders should activate office TPM in conjunction with the other pillars to reduce losses and improve ROI. The last pillar, safety, hygiene, and environmental control require the participation of everyone in the organization to create awareness and sustain a safe environment (Wahmare et al.). California community college leaders could adapt all eight of these pillars at campus environments to sustain and improve facility operations and maintenance functions.

Wahmare et al. (2014) noted that FMEA is an analytical quality-planning tool used to identify main potential failure modes in manufacturing that is effective in reducing customer complaints and equipment failure. California community college leaders could use the FMEA tool to aid in the identification of student and employee issues regarding facility operation and maintenance that negatively affect the mission. Leaders could use a FMEA like tool to obtain feedback from students and employees to improve student satisfaction and employee morale. If coupled with the TPM strategies the improved work and learning environment could reduce costs and deferred maintenance while improve mission requirements. Shen (2014) noted that leaders should expect that implementation of TPM could take 2.5 to 3 years and could take even longer in large organizations.

Transition

The purpose of Section 1 was to introduce the study, problem statement, and central research question. The key elements for this study contained in Section 1 were (a) the Problem Statement, (b) Purpose Statement, (c) Nature of the Study, (d) Research Question, (e) Conceptual Framework, (f) Significance of the Study, and (g) the Literature Review. I explored various theories and models in the conceptual framework for this study and determined that Chamberlain's (2011) strategy theory and the integration of Lewin's (1951) and Kotter's (2012) change theories were the most appropriate concepts to ground this study. The literature review included the history of community colleges, funding for California community college operations, and a summary of facility and maintenance operations. California community college leaders need new strategies to sustain or improve facilities to meet the college mission (Collins, 2011; Taylor, 2014). The literature review disclosed a void in the knowledge of California community college practices needed to help leaders create new strategies for sustaining or improving facility and maintenance operations. Collins (2011) concluded that additional qualitative and quantitative research was required on this topic.

Section 2 contains the details of the research methodology and design, research elements such as population and sample, ethics, data collection, validity, and reliability. I present the findings and implications from the research, data collection, and analysis in Section 3.

Section 2: The Project

The focus of this qualitative multicase study was to explore business strategies California community college leaders use to sustain or improve facilities needs to meet the college mission. Community colleges in California continue to experience a decrease in funding, which negatively affects college facility and maintenance operations (Collins, 2011; Taylor, 2014). The analysis of the background information and literature review in Section 1 provides the foundation needed to identify the best methodology and research design to conduct this qualitative study.

Purpose Statement

The purpose of this qualitative multicase study was to explore the strategies California community college leaders use to sustain or improve facilities maintenance operations to meet the college mission. The population included senior administrators (chancellors, presidents, vice chancellors, vice presidents of business, facility operations, and executives of facility management and planning) from three large California community colleges who have used strategies to address sustaining or improving their facility maintenance operations. The research findings may help college CEOs identify specific operational options that might improve overall strategies to sustain or improve facility maintenance operations needed to meet the college mission. Since economic development of communities is now part of the community college mission, sustaining these institutions may help ensure the wellbeing of the communities these colleges support (Cohen & Kisker, 2014) and enhance the social fabricate in these states.

Role of the Researcher

The primary role of the researcher in a qualitative study is one of instrumentation, rigor, and bias management when conducting an interview as the main data generation method of the study (Lincoln & Guba, 2013; Van Manen, 2014). I was the instrument for collection of primary data through the semistructured interview process. Using a multicase study design has many advantages and Yin (2014) considered this type of design more persuasive than single case studies. Irvine et al. (2013) found that semistructured interview questions were one of the most commonly used qualitative tools that produced quality themes from multiple participants. Yin (2014) noted that qualitative research designs that use semistructured interviews should either create a literal replication or provide contrasting results. The secondary data I used came from the archival reports of each college.

I had a professional relationship with the participants because of my previous position as a college president in California and having served as a Chief Operating Officer, Director of Budget and Finance, and Director of Facilities at a large community college. I have been in leadership roles managing facilities maintenance and facilities operations at a California and a Texas community college. Previously, as a college president in California, I was responsible for developing and implementing facilities and maintenance strategies and plans responsive to sustaining or improving the college mission. The researcher's personal beliefs, experiences, and relationships can affect analysis of the research data and have an impact on the design, conduct, and the dissemination of research (Bero, 2014). I followed the ethical standards of research to refrain from letting my bias influence the data collection, analysis, and conclusions (Smith & Noble, 2014). I followed all four ethical key principles of the

Belmont Report throughout this study: embodying ethical action, respecting participants, generalizing beneficence, and negotiating justice (Bromley, Mikesell, Jones, & Khodyakov, 2015). I participated in the interviews only as a recorder of the participant responses. I provided a written copy of the questions and I read each interview question to the participant. I then followed up with probing questions as needed to obtain rich feedback from each participant. I refrained from reacting in any way that might have influenced the participant due to my body language. I recorded and transcribed the responses and extracted the data using the search function of MS Word, and conducted an analysis of the data to determine the results (Morse, 2015). I used a rigorous data collection process to help ensure I did not influence the outcomes or manipulate the data because of my personal bias as recommended by Smith and Noble (2014).

Irvine, Drew, and Sainsbury (2013) opined that doing in-depth interviews allows the researcher to listen and understand with the purpose of developing new knowledge. The knowledge I gained from the interviews will help to create best practices for community college leaders. Given the participants roles and responsibilities and their experience, participants created knowledge from the stories of their experiences and were of worth to community college educational business practices.

Participants

The participants of this study consist of a purposive sample of senior administrators of three large community colleges in California who have implemented strategies to sustain or improve facilities and maintenance operations. The eligibility criteria for the participants were that each participant must be a senior administrator of a California community college. I

defined senior administrators as chancellors, presidents, vice chancellors, vice presidents of business, facility operations, and executives of facility management and planning. I solicited participants from three colleges via a letter of introduction requesting a time and method for the interview. There are no specific guidelines on the number of cases selected in multicase research; however, the number of cases selected should be reflective of the research question (Yin, 2014). I generated a list of all of the eligible participants from my contact lists of senior administrators at the three colleges and interviewed three participants from CACC#1 and #2, and four participants from CACC#3. The contact list of senior administrators was located online at each college website. As a prior community college president, I had access to the public lists of community college senior administrators in California. I use the contact list to email and telephone the selected participants to schedule an interview. Pedrosa, Naslund, and Jasmand (2012) described the value of ensuring the participants were connected to the study. Townsend and Cox (2013) discovered that the motivation for participants included personal gain and the desire to create new knowledge. All of the participants recognized the importance of the study and the research question because maintenance and facilities operation costs were part of their responsibilities.

I established a working relationship with the participants by first sending out a letter of information regarding the study (purpose, problem, and the significance of the study) and second, by calling each of them. I informed the senior executives that I appreciate their contribution to this study and I created knowledge to help develop best practices for community colleges. I started each interview by providing my background regarding facilities and maintenance operations and providing them with the limits and scope of the

topic. The interviewed participants participated in a recorded face-to-face interview as well as follow-up interviews for member checking. I provided each person a copy of the Consent to Participate Form prior to starting the interviews (see Appendix A).

I informed the participants that to preclude any compromise of their information, I secured all data collected in a password-protected thumb-drive and will keep it for 5 years to allay any concerns that they might have. After 5 years, I will destroy all data. I will maintain ethical standards for protecting this information at all times.

Research Method and Design

Researchers create the ability for others to follow in the footsteps to expand or confirm knowledge through the methods and designs of a research process (Patton, 2015). When the researcher identifies the type and method of research, the university conducts a critical review of how the researcher will conduct the study. The driving issue in identifying a design is a reflection of the research question. In order to replicate research, one should provide a detailed research plan (Patton, 2015). I explained the method and design for this research in the following section.

Method

The three primary research methods to gather data are qualitative, quantitative, and mixed methods. Patton (2015) noted that all three methods have strengths and weaknesses. A researcher uses qualitative research method to explore and gain understanding that emerges from concepts, patterns, and perceptions expressed by sample participants (Vaughn, Parsons, Kologi, & Saul, 2014). Researchers use quantitative research methods to test a hypothesis to determine the level of statistical significance (Pedrosa et al., 2012). Flick (2014) noted that

researchers who used quantitative methods to test hypotheses through researchers' assumptions ignore stakeholders' qualitative input. Mixed method is a combination of the qualitative and quantitative methods that researchers use to reinforce the validity and reliability of the data (Flick, 2015; Smith, Sparkes, Phoenix, & Kirkby, 2012).

Basi (2014) noted that qualitative researchers recognize that existential objectivity in research is not always possible. However, some researchers continue to challenge qualitative research because they question issues like subjectivity, validity, and the reliability of qualitative findings (Basi, 2014). Researchers studying management where the researcher is the human instrument of data collection are most likely to use qualitative research methods (Basi, 2014).

The use of a qualitative method is more appropriate for this study than a quantitative or mixed method because when the researcher studies a case or cases through the lens of individual perspectives this allows the researcher to create new knowledge about a subject or construct (Patton, 2015; Yin, 2014). In qualitative research, the researcher explores various thoughts and perceptions. These thoughts and perceptions may converge or diverge to create an understanding of possible explanations of why something is happening or may happen in the future (Patton). Flick (2015) asserted qualitative method lead to an understanding of why and what a specific behavior might be for some specific individuals or groups.

Qualitative researchers have the opportunity to explore situations and phenomena in a real world setting (Pedrosa et al., 2012). The various sources of qualitative experimental forms are (a) case study, (b) personal experience, (c) introspection, (d) life story, (e) interview, (f) artifacts, (g) cultural texts and production, (h) observational, (i) historical, (j)

interactional, and (k) visual text (Denzin & Lincoln, 2011). All of these forms depict challenges that an individual might have or an overall understanding of the individuals' life (Denzin & Lincoln, 2011). The participant stakeholder has an active voice in qualitative research (Patton, 2015). Morse (2015) concluded that researchers who conduct qualitative data analysis look for specific common regularities or themes to explore and determine how these themes may relate to one another. The themes that qualitative researchers develop help create new knowledge about the real world phenomena being explored (Pedrosa et al.).

Patton (2015) noted that the methodology used to solve a problem should be part of the design of the study. A qualitative method is the most effective research method given this study's research question because alternate forms of research do not provide insight in the interrogatories of *why* and *how* (Patton, 2015). Denzin and Lincoln (2011) provided there are various definitional issues in qualitative research. Traditions associated with foundationalism, positivism, postfoundationalism, postpositivism, and poststructuralism are within the family of terms, concepts, and assumptions that are consistent with the definition of qualitative research, which is a separate field of study (Denzin & Lincoln, 2011). This study required an understanding of how and why leaders of community colleges in California have reacted to exploring business strategies to sustain or improve facilities maintenance operations not whether they will act, which required the researcher to use the qualitative methodology. Thus, I considered the strategies of California community colleges based on the active voice of those leaders responsible for change warranted by researching critical maintenance operations needed to meet the mission requirements.

The researcher not only selects the method of study to conduct, but also decides on a type of study within this qualitative choice (Patton, 2015; Yin, 2014). Strategies of inquiry are types of qualitative designs or models that provide specific direction for procedures in a research design and help researchers create rigor (Van Manen, 2014; Yilmaz, 2013; Yin, 2014). There are various characteristics of qualitative research designs, which include descriptive or narrative studies, case studies, phenomenological, and ethnography, and each design requires the researcher to complete the research with separate procedures and approaches (Yilmaz, 2013). Yin advised that the research question should help the researcher determine the design that is most appropriate.

Research Design

I selected a multicase study research design because it was the most appropriate design for the research question. The benefit of applying a case study approach is it can cover multiple cases while utilizing all of the data received in a single form of cross-case conclusions (Yin, 2014). I used an interview protocol. I used the protocol to help me identify themes based on community college leaders' knowledge of strategies to sustain or improve facility maintenance operations to meet the college mission. The multiple case study design involves developing questions and procedures, data collection, data analysis building, and then I made interpretations of the meaning of the collected data.

A multicase study was more appropriate than any of the other categories of research design (i.e. ethnography, phenomenological, and narrative) because a multicase study lends itself best to address the issues reflective of individual perceptions and predicting organizational behavior (Moret-Hartman, Reuzel, Grin, Kramers, & van der Wilt, 2011). The

researcher who uses the multicase study has the ability to obtain detailed information categorized into themes from participants (Patton, 2015; Yin, 2014), which in this research might suggest behavior leaders may take in response to improving or sustaining facility maintenance operations to meet the college mission.

Ethnography is the study of groups over extended periods in a natural setting where the researcher intensely engages with the studied participants (Hegner, 2013). A miniethnographic design involves a narrow area of inquiry where the researcher observes the participant actions (Flick, 2015). The observations of leader participants in this study would not yield the desired outcome because it would be impossible to observe all of the participants simultaneously because of the disparate locations of the cases.

I also considered narrative and phenomenological designs. However, the phenomenological design focuses on occurrences or observations of a single phenomenon to determine meaning or relevance in the exploration of why (Van Manen, 2014). Petty et al. (2012) found that case studies, unlike phenomenological designs, focused on circumstances surrounding an experience not the actual lived experiences. Based on the information provided by Denzin and Lincoln (2011), I opined narrative design was not appropriate for multicase studies as this design uses a story developed by the researcher from individual experiences. Researchers generally use narrative design in social research (Denzin & Lincoln, 2011).

I used one state system of colleges with multiple colleges as the individual cases and used individual perceptions as the primary data elements. Based on Yin's (2014) research design definition, I selected the research design as a multicase study. The sample population

for this research consisted of senior administrators (chancellors, presidents, vice chancellors, vice presidents of business, facility operations, and executives of facility management and planning) from three large community colleges in California. There are no specific guidelines for the number of cases selected in a multicase research; and as such, the case or cases should be reflective of the research question (Yin, 2014).

Population and Sampling

Patton (2015) described purposeful, snowballing, and random sampling among the techniques that qualitative researchers could use to identify participants. Sampling is the process of selecting units (such as people and organizations) from a population of interest (O'Reilly & Parker, 2013). A researcher conducting a population study needs to present a strategy for selecting the sample participants from a population (O'Reilly & Parker, 2013). There are various sampling techniques available to qualitative researchers; however, purposeful sampling is widely used in qualitative research to identify and select data rich participants within cases (Palinkas et al., 2015). Suri (2011) noted that purposeful sampling is effective when the participants are knowledgeable of the data and the researcher has limited time. For this study, the strategy I used was purposeful sampling because Suri stated there is a higher possibility of data saturation when the sample and data collection is purposeful. I selected participants from California community colleges who have similar jobs and work in community college environments. O'Reilly and Parker (2013) stated researchers, based on the criteria developed for the study, should use their professional judgment to select the purposeful sample, which was what I did.

There are usually 3 to 8 senior administrators at each California community college; however, the vice presidents or vice chancellors of academic affairs/instruction and the vice presidents or vice chancellors of student services have little knowledge of facility operations and maintenance. I selected a purposeful sample of individuals from senior administrators of three large community colleges from the State of California who have knowledge about facility operations and maintenance. I define these senior administrators as chancellors, presidents, vice chancellors, vice presidents of business, facility operations, and executives of facility management and planning. Although there are usually 3 to 8 individuals at each college who meet the eligibility criteria, I only purposely selected three from CACC#1 and CACC#2, and four from CACC#3 to be in the research sample. I used interviews to explore how California facilities maintainance and deffered maintainence along with finding ways to improve current facilities has affected the decision making of community college leaders regarding college operations. I selected this specific group because the leaders within this group were most knowledgeable on the operations of a community college and they share similar characteristics and jobs, which make them homogeneous (Suri, 2011).

Patton (2015) stated the strategy of selecting a small purposive homogeneous sample is an effective research collection method. Yin (2014) explained that for the utilization of multicase replication design research, each single case should have a similar set of characteristics, which might allow for generalization similar to the way multi-experiments do in quantitative research. In this particular study, the similarity in population and sample was gathering data from community college leaders in California. I used the criterion of their position at the colleges to select a sample of homogeneous participants. The eligibility

criterion for the participants was that each participant must have been a senior administrator of a California community college. These participants were the most influential in community decision making and were part of the college governance structure (Cohen & Kisker, 2014).

The purposive sample included three out of the possible leaders in the population of senior leaders at each of the three colleges. This purposive sample met the requirement for population sampling as discussed by Vaughn et al. (2014). The sample size of this small population helped ensure data saturation (Suri, 2011). Palinkas et al. (2015) and Suri (2011) stated there is a higher possibility of data saturation when the sample and data collection is purposeful. In qualitative research the concerns regarding sample size are not about the actual number of participants, rather the quality and richness of information the individuals provide (O'Reilly & Parker, 2013).

Data saturation is a necessary component of rigorous research in qualitative studies to ensure validity (Fusch & Ness, 2015). Data saturaturation is achieved when the researcher is unable to develop new information on the specific question (O'Reilly & Parker, 2013). There does not appear to be consensus on a single criterion that defines when or how data saturation occurs (Fusch & Ness, 2015). Vaughn et al. (2014) noted that data saturation could require a large participant pool to create sufficient data and create saturation of a research topic; however, a researcher could achieve the same effect with a narrowly focused small participant pool. Fusch and Ness (2015) described data saturation effectiveness as the collection of data that is *rich* and *thick*, and noted that when both criteria are present data saturaturation occurs. Rich data is a term that refers to the quality of the data, and thick data is a term that refers to the amount of data (Fusch & Ness, 2015). Fusch and Ness (2015)

noted that interviews are one of the data collection techniques that a researcher can use to reach data saturation. O'Reilly and Parker (2013) advised data saturation could happen because of the expert knowledge of the participants.

I interviewed three leaders from CACC#1 and CACC#2, and four leaders from CACC#3, which was a representative sample from this population of experts in their leadership field. I set appointments with each participant at their office on the various college campuses. I ensured data saturation by creating the opportunity for these participants to respond to open-ended questions and asked probing follow-up questions to allow each participant to expand their responses until they could not provide any additional information. I created data saturation based on the size and depth of the sample and the ability to find repetition in the data through interviewing most of the leaders in these cases (Walker, 2012). Data saturation or sample adequacy arises during the collection of data when the researcher no longer hears any new information, needs any new coding, can find any new themes, and when the data can be replicated (O'Reilly & Parker, 2013).

Ethical Research

Before I began data collection, I obtained the Walden University IRB approval (reference #04-01-16-0467641) to ensure the proposal reflected ethical protection guidelines. Upon receiving IRB approval, I addressed all ethical concerns throughout the data collection and analysis processes (Bromley et al., 2015). I followed the ethical standards and framework provided by Bromley et al. and Smith and Noble (2014). Ethical principles guide the researcher to protect participants and to ensure credibility during the research process (Bromley et al., 2015), even if interviews are conducted by telephone or online.

Confidentiality is a crucial concern for both organizations and individuals. Apprehension for both parties can stem from uncertainty that someone could harm them using the information divulged about their operations, management, and their personal data (Vaughn et al., 2014). I kept all titles and references to specific positions confidential because of the need to safeguard the confidentiality of the participants. I referred to each participant with a participant code such as P-1, P-2, P-3, in the final published study. I securely maintained a separate log of the coded participants, which was not part of the final research document. In addition, I protected the names of the community colleges as follows – California colleges coded as CACC#1, CACC#2, and CACC#3. I put safeguards in place in order to shield the sample population's identity and location (Denzin & Lincoln, 2011). Confidentiality and upholding ethical standards are critical components of gathering data in qualitative research (Damianakis & Woodford, 2012). I assured the sample population that I concealed all data provided behind a shield of confidentiality as to not create harm or embarrassment.

I provided the Consent Form (See Appendix A) to each participant ahead of time via email. The participant response via email was the acknowledgement of their voluntary agreement to participate in the study. The participants could have elected to withdraw from the process of answering questions at any time but none did. One participant, P-2 CACC#2, decided to skip and not answer question 3, *What short-term strategies have you implemented for sustaining facility operations?* I did not compensate or provide any incentives to the participants who wished to respond to the interview questions or participate in this study. I will maintain the data I collected in a secured location for a period of five years and I will destroy thereafter. Walden University's IRB approval is #04-01-16-0467641.

Data Collection

Data collection is a critical element of any research. This data collection section covers research instrument, data collection technique, data organization, and data analysis. Data collection methods flow from the research questions and affect the method chosen (Yin, 2014). I created a data collection plan and identified the essential questions, and used the questions in a semistructured interview process based on the central research question (See Appendices B and C). Upon completion of the interviews, I organized and analyzed the data to allow themes to emerge. Four major themes emerged, (a) *planning,* (b) *funding,* (c) *maintenance strategies*, and (d) *people*.

Data Collection Instruments

Suri (2011) stated the researcher in qualitative method is the data collection instrument. Patton (2015) further described how the researcher is an effective tool. I was the primary data collection instrument because I have the knowledge, sensitivity, and skills that were essential in developing the quality of the data (Rowley, 2012). In qualitative research, Lincoln and Guba (2013) pioneered the concept that the researcher is a unique data collection instrument, who can bring flexibility and sensitivity to the process and be responsive to human questions.

Interviews may be structured, semistructured, or unstructured (Patton, 2015). Semistructured interviews, similar to structured interviews, allow the participants to elaborate on questions but also create the opportunity for more freedom by allowing the participants to expand their responses creating thick rich detail (Condie, 2012; Irvine, et al., 2013). I allowed the participants to talk uninterrupted (Condie, 2012). The ability of researchers to

ask follow-up probing questions enhances the validity of the data saturation (Condie, 2012; Irvine et al., 2013). Patton (2015) noted that semistructured interviews also create the ability of the researcher to compare data across cases in multicase studies. I made the decision to conduct semistructured interviews that allowed for the elements of human character to extract data from the participants in this multicase study.

The primary data collection tool for this qualitative multicase study consisted of a semistructured interviewing process of open-ended questions and follow-up probing questions. The researcher who uses a multicase study approach can identify common characteristics within each case, which are homogeneous or similar to all of the cases (Patton, 2015). I collected empirical data by using open-ended questions to solicit responses of leader perceptions of facility operations and maintenance strategies.

There are several strategies that a qualitative researcher can use to enhance reliability and validity of the data collection process, which include (a) prolonged engagement, (b) persistent observation, (c) peer review or debriefing, (d) clarifying researcher bias, (e) member checking, and (f) external audits (Morse, 2015). Morse described member checking as a step in the validity process where the researcher gives the transcribed interview back to the participant to gain additional information or verify the content of the statements. Member checking is an essential component of data saturation as one can ensure that the participants exhausted all of the information they had during the member checking process (Morse, 2015).

In addition to member checking, I reviewed the data from their college accreditation, strategic plan, educational master plan, facility master plan, and budget documents. Leaders

are required to document their facility and operations strategies in these plans. I used these plans as a secondary source of data. One should be able to verify the veracity of statements made in the interviews by checking these documents to determine if there are similar strategies outlined in the plans. All of the documents I reviewed were public reports. I accessed the documents, which I found on participant college websites.

Data Collection Technique

As the interviewer and primary data collection instrument, I used a semistructured interview technique by asking open-ended questions and probing follow-up questions as needed, to clarify and get comprehensive responses to each question (Condie, 2012). I communicated in writing (email) or telephonically with each participant to determine whether they would like to do a face-to-face interview or use either telephonic or video-conferencing (Skype) to complete the data collection process. All participants agreed to schedule face-to-face interviews. I recorded all of the interviews and I transcribed the interviews verbatim.

I used a voice recording device feature on my Apple MacAir computer when I did the face-to-face interviews to capture participant responses to the interview questions. I recorded all of the comments I made, including probing follow-up questions, and I collected the data from the participants. Utilizing open-ended questions is a common manner of collecting data when conducting a qualitative study (Nobel & Smith, 2015). I reviewed all of the questions to ensure they were not ambiguous to improve the reliability of the interview as a collection process. I provided a detailed process of the interview protocol (See Appendix C).

I asked each of the participants who agreed to partake in a semistructured interview the same questions guided by the central research question. Semistructured interviews have a predetermined protocol but the researcher may ask probing follow-up questions to invoke more data from the participant (Smith & Noble, 2014). I allowed the participants to talk uninterrupted as described by Condie (2012), which gave the participants a sense of control during the interviews and increased data validity. Thereafter, I asked probing follow-up questions to ensure the participant responses were clear, rich in detail, and were well-defined.

The goal of conducting a qualitative multicase study is to get an in-depth understanding of something, a program, an event, a place, a person, or an organization (Yin, 2014). Senior administrators of the three large community colleges in California provided their individual perceptions of the strategies needed to sustain or improve facility maintenance operations to meet the college mission. This sample population consisted of senior administrators (chancellors, presidents, vice chancellors, vice presidents of business, facility operations, and executives of facility management and planning) from three large community colleges in California. The disadvantages of using interviews are two-fold; speed of data collection and analysis and reduction of bias (Smith & Noble, 2014). I prearranged convenient interview times for the participants and I conducted all of the interviews in person. Researchers who conduct personal interviews should be careful not to use their personal bias or interpretation of body language or misunderstanding of the response, which could skew the results (Denzin & Lincoln, 2011). I did not interject my assumptions, beliefs, or perceptions to guide the participant responses. I remained professional and avoided

inappropriate gestures and body language that might have influenced an individual's response. I did not eliminate any responses to skew the data.

Prior to each interview, I verified that the participant affirmed their voluntary willingness and I had each participant complete a consent statement (Condie, 2012). All of the participants consented to the interviews. I recorded that they gave consent to participate in the interview. The consent form includes the purpose of the study and the significance of the study (See Appendix A).

I wrote all interview questions in a manner that was easy to understand at an English written comprehension level of 11th grade based on the Flesch-Kincaid Grade Level test. All participants were college graduates and most of them have completed graduate studies, thus they did not have any problems comprehending 11th grade reading level interview questions. I used the readability tools in MS Word to accurately measure the grade level. I recorded all participant responses and my conversation with the participants. Each interview lasted approximately 30-60 minutes (See Appendix C for the exact semistructured open-ended questions). This amount of time was sufficient and when needed, I asked probing follow-up questions for clarity or additional detailed information. I informed the participant of the estimated time requirement and scheduled the interview at a time most convenient for the participants. Upon completion of the interview, I followed up with a thank you letter.

The researcher should verify and triangulate the data with a secondary source during the interview process (Patton, 2015). I reviewed the data on strategies provided by the participants by comparing what they said with the plans they had written. Each California community college is required to have a facilities master plan in response to accreditation

standards and a capital outlay plan as required by the California Community College Chancellor's Office (2015b). Within these two documents were strategies that the community college leaders used for long-term and short-term facility operations and maintenance.

Annually, all California community colleges submit a 5-year Capital Outlay Plan to the California Community College Chancellor's Office (California Community College Chancellor's Office, 2015b). Each capital outlay plan contains the college's deferred maintenance project and major renovation projects, which colleges need categorical funding to complete as part of the overall state budget (Taylor, 2014). Facility master plans and responses to accreditation reports contain strategies and implementation milestones of actions needed to sustain facilities in accordance with state guidelines and accreditation standards. The Accrediting Commission for Community and Junior Colleges (2015) requires colleges to comply with Standard 3B, *Physical Resources*. Standard 3B has four components that all California community colleges must comply. The colleges must (a) assure safe and healthy environments, (b) plan and implement, and maintain physical resources to assure effective use and the continuing quality to achieve its mission, (c) create facility plans and evaluate regularly, (d) have long-range capital improvement plans and reflect the total cost of ownership of resources (Accrediting Commission for Community and Junior Colleges, 2015).

I reviewed the data in these plans to explore business strategies some California community college leaders use to sustain or improve facilities needs to meet the college mission. I used these plans and reports as empirical data of what community college leaders expressed they are doing or will do regarding facility operations and maintenance. I solicited

individual college accreditation reports, master facility plans, total cost of ownership data, and budgetary reports from the college or downloaded these reports from the college websites. I obtained other similar reports from the state community college agencies and the California Community College Chancellor's Office. All of these reports were public information and thus available to me.

Leaders must provide accurate and reliable strategies and plans in accreditation reports and reports to the state to sustain the accreditation of the college and receive funding from the state. Thus, one should be able to rely on the information and data found in these reports and plans. However, one disadvantage I had in using these types of reports was that the participant leader's current strategies might not be in these reports. During the follow-up member checking, I reconciled the strategies presented by participants with reports online or filed with the state.

Harper and Cole (2012) stated the researcher should do member checking at the time of the interview by repeating the responses to the questions to ensure the statement was received and accurately understood. A second member checking step occurs after the researcher completes the transcript review. Prior to the second member checking step, qualitative researchers should do a thorough transcript review of each interview to verify that each transcript was accurate and complete (Harper & Cole, 2012; Morse, 2015). I used transcript verification reviews and member checking to enhance the reliability and validity of the data as recommended by Morse. After reviewing each transcript, I contacted the participants and scheduled an appointment to review their transcripts with them either at their office or telephonically. None of the participants made any changes. I then emailed a copy of

the transcripts and the emergent themes to the participants and I conducted a detailed review with them at the scheduled time.

Data Organization

Salanda (2015) recommended that researchers start coding as soon as one begins the work of data collection and not wait until the data collection is complete. Researchers should have some assumptions about the kind of data that appears and the researcher could develop codes or word lists that are logical and discriminating (Salanda, 2015). I used a theasarsus as recommended by Saldana (2015) to develop a list of words that were similar in meaning to categorize under a single discreet code. Saldana suggested that a researcher start with the raw data or complete sentences and determine how well they match to a preliminary code, which was how I started. Once all of the preliminary coding is complete and all of the data has been matched to discreet word codes, then the researcher can consolidate the data under final coding discriminators based on the frequency that a specific term or word is used by the participants.

I used coding discriminators to align the data as described by Saldana (2015). I organized the themes that emerged from the interview data and coded the data using the following scheme: (a) A-1 through A-10 for maintenance priorities, (b) B-1 through B-10 for facility strategy for emergencies, (c) C-1 through C-10 for facility strategies for routine maintenance, (d) D-1 through D-10 for strategies for reducing deferred maintenance, and (e) E-1 through E-10 for other strategies. I recognized that the responses may have created a need for a different coding scheme and I reviewed the results to ensure the codes were relevant to the data received. I documented the number of times a response, concern, or issue

occured in the responses to the open-ended questions using the coding process, which is an acceptable scholarly research practice (Goodman, Cryder, & Cheema, 2013; Smith & Noble, 2014). I coded, categorized, and segmented participant data to identify trends (Saldana, 2015).

Upon collection of the data, I transferred the data file to a thumb-drive. I used MS Word software as a tool to help me sort and manage the data. I used MS Word as a medium to segment themes and units and to incorporate all sources of data from the multiple cases into one report. I stored the research data that I collected on a password protected thumb drive, a second electronic backup storage file on another thumb drive, and made two paper copies of transcripts and notes that were stored in my safety deposit box. Once the interviews were completed, all participants received a letter of gratitude for their contribution to this study. I will retain all data collected, work papers, study information for five years, as required by Walden University, and then destroy all research data and documents. I asked each participant if they would like to receive a copy of their transcript and the results of the study. None of the participants requested copies of their transcripts. I will provide the participants with a copy of the completed study, if requested.

Data Analysis

The central research question of this study is: *What strategies do California community college leaders use to sustain or improve facility maintenance operations to meet the college mission?* I used the interview questions to explore the various facets of the central research question (Irvine, Drew, & Sainsbury, 2013). I designed the semistructured interview questions to improve the understanding of strategies being affected by community college

leaders to sustain and improve college facility maintenance operations. The semistructured line of questioning was designed to create data saturation and was one component of the triangulation process I used (Fusch & Ness, 2015). I developed themes through an analysis of discrete word analysis (Salanda, 2015). I analyzed the data I received from each participant response from the following semistructured interview questions:

1. What strategies do you use to sustain institutional facility maintenance and reduce deferred maintenance?
2. What strategies do you use to improve institutional facility maintenance and reduce deferred maintenance?
3. What short-term strategies have you implemented for sustaining facilities operations?
4. What strategies failed to sustain institutional facility maintenance and reduce deferred maintenance?
5. What long-term budget strategies have you implemented for facilities operations?
6. What additional information would you like to share that we have not addressed on this topic?

Data analysis, like data collection, is a vital process that the researcher must carefully conduct to ensure objectivity and dependability (Lincoln & Guba, 2013). The interpretation of data must be free of bias, repeatable, and responsive to the central research question (Basurto & Speer, 2012). Denzin and Lincoln (2011) described triangulation as a process that strengthens the analysis of data. There are four types of triangulation (a) data triangulation, where the researcher uses various sources of data, (b) investigator triangulation, where the researcher uses several different investigators to explore the same subject, (c) theory

triangulation, where the researcher uses multiple perspectives, and (d) methodological triangulation to study a single problem. I conducted methodological triangulation of the data. I developed four major themes, (a) *planning*, (b) *funding,* (c) *maintenance strategies,* and (d) *people*, from the 135 key concepts and ideas that were reflective of the responses from the participants.

Methodological triangulation improves the validity of the case study findings (Verner & Abdullah, 2012; Yin, 2014). The researcher corroborates the evidence and this reduces the chance that any single voice or piece of data has the defining outcome (Verner & Abdullah, 2012). I also reviewed the individual college facilities and budget reports, and reviewed verification of changes made to the college schedule of class by semesters to verify statements made by the participants as another data point to add to the data analysis of the research question. I compared the themes and budgetary data from archival reports from the three California sample colleges to determine if they contained facility strategies for reoccurring maintenance. I compared the data with the reports to determine if responses were consistent with actions and I verified if the statements were reliable.

I analyzed the responses to identify strategies needed to sustain or improve facility maintenance operations to meet the college mission (Taylor, 2014). The participants' responses were analyzed using summative content analysis methods created by Saldana (2015). I created codes using the techniques identified by Saldana. I summarized the participant responses and used Saldana's (2015) splitting coding technique to develop themes. I assessed these themes based on frequency and significance to develop my conclusions. I then sorted data by their degree of alignment or disagreement. Based on the

patterns developed, I grouped categories of conclusions based on the congruence of the findings within each case and across the multicases (Saldana, 2015). I then reviewed the results of the responses, key words and phrases, and common themes used to determine frequencies and significant findings. The premise of this process was to develop and refine relationships between concepts and themes (Saldana, 2015).

Yin (2014) noted that there are five analytic techniques one may choose to analyze data: (a) pattern matching, (b) explanation building, (c) time-series analysis, (d) logic models, and (e) cross-case synthesis. The pattern matching technique parallels an empirically based pattern with a predicted pattern that the researcher could link to qualitative themes or quantitative variables within the study (Yin, 2014). Explanation building is a specific type of pattern analysis of case study data by constructing an explanation about the case in qualitative research. The time-series analysis technique is similar to the pattern matching technique; however, this quantitative technique focuses on a time series design and may use a single dependent or independent variable (Yilmaz, 2013; Yin, 2014; Zohrabi, 2013). The logic model technique specifies an intricate chain of measures over a specific interval and a researcher generally uses the logic model for quantitative studies (Yin, 2014). Qualitative researchers conducting multicase studies can use the cross-case synthesis to analyze multiple cases in a method and treat each case as a distinct study (Yin, 2014). I used the pattern matching technique for the development of themes from the response data provided by the participants.

The data analysis stage that includes categorizing, coding, and separating participant responses is critical to the validation process (Saldana, 2015). I drew the conclusions from

the consensus among the groups as to why the issue, claim, or concern occurred. Structural analysis included data evaluation for its quality, consistency, and continuity, and reflective analysis includes addressing the what, when, and how a claim, concern, and issue received consensus. The selected participants addressed alternatives and the consequences without recourse during the data collection phase. Table 1 includes the major steps for data analysis.

Table 1

Data Analysis Procedure

Step	Data Analysis Procedure
Step 1	Create codes based techniques prescribed by Saldana (2015)
Step 2	Review tapes and input transcribed interview text
Step 3	Review tape and transcription output and categorize data by type based on alignment into themes.
Step 4	Send reminder to expert panel reviewers and confirm their availability to review draft results
Step 5	Start interpretational analysis, conduct person and methodological triangulation
Step 6	Assess reliability and validity of the study and process of analysis
Step 7	Write draft report of findings
Step 8	Send report to review panel via email
Step 9	Contact non-responsive panel member
Step 10	Review expert panel comments and complete final report

Salanda (2015) described two techniques for coding, *lumper coding* and *splitter coding*. Lumper coding refers to the techniques researchers use to assign a single code to a

large amount of text or qualitative information (Salanda, 2015). Splitter coding is just the opposite of lumper coding where the researcher creates a more detailed set of codes for the text (Salanda, 2015). I used splitter coding techniques identified by Saldana and then processed the responses using MS Word to help create reliability of the themes (Morse, 2015). I used the following preliminary codes for the themes that emerged from the interview data: (a) A-1 through A-10 for maintenance priorities, (b) B-1 through B-10 for facility strategy for emergencies, (c) C-1 through C-10 for facility strategies for routine maintenance, (d) D-1 through D-10 for strategies for reducing deferred maintenance, and (e) E-1 through E-10 for other strategies. Researchers, who analyze case studies to determine important themes, can do so by identifying the frequency that the same term or a synonym arises in the narrative description (Cope, 2014). However, Saldana noted that frequency should not be the single determining factor for splitting data into themes; rather the researcher should also consider the significance of data even if the word only appears a few times.

I finalized the coding and split the themes further as determined by the frequency and significance of themes in a more discrete fashion. I used the tools in MS Word to help me identify possible themes that emerged from the data. The analysis of these themes helped me develop a conclusion (Morse, 2015). I used the tool to calculate the number of repetitions that specific words or phrases occurred in the responses of the participants (Morse, 2015). I used coding techniques identified by Saldana (2015) and then processed the responses using MS Word to help create reliability of the themes (Morse, 2015). I used MS Word as the software tool to calculate frequencies of occurrence in coded themes. I reviewed the results

to determine the themes with the highest frequencies, unique occurrences, anomalies, outliers, and unique themes to a specific demographic or college leader.

I processed the data twice to ensure I did not make any errors or used the tool incorrectly. If there were any differences in the results between the two outcomes, I investigated further to determine if I made an error in either how I used the tool or how I inputted the data. I made no errors or corrections. I documented all steps in the process and I documented how I reached my conclusions (Noble & Smith, 2015).

I prioritized the themes and determined the significance of the themes from which I drew my conclusions. I reviewed the transcript of each interview by listening to the tape recording twice to verify the transcript was verbatim and accurate to ensure reliability and validity of the data (Noble & Smith, 2015; Saldana, 2015). I also conducted member checking follow-up interviews to enhance the *dependability* of the data (Lincoln & Guba, 2013). I detailed the interview protocol and listed the six interview questions in Appendix C.

I used methodological triangulation to verify the accuracy and validity of the interview data. Methodological triangulation is a method of data validation (Denzin & Lincoln, 2011; Marshall & Rossman, 2016). In addition to my interview data, I used college archival documents including individual college budget data, strategic plans, facility master plans, and educational master plans to determine how California community colleges sustain facilities maintenance operations to substantiate what the participants stated in the interviews.

I recorded and analyzed the findings of the participants consistent with practices of the interpretational analysis, structural analysis, and reflective analysis as recommended by Saldana (2015). Interpretational analysis includes various coding schemes (Hoare, Mills, &

Francis, 2012; Saldana, 2015). I used a combination of 3 steps (a) identifying and naming the categories into which data or observations were grouped, (b) coding for insights into the participants experience, and (c) identifying themes from the perspective patterns in the codes (Hoare et al., 2012; Saldana, 2015). Prior to the analysis of the data I assumed there might be four categories that the data should fit within (a) maintenance priorities, (b) facility strategy for emergencies, (c) facility strategies for routine maintenance, and (d) strategies for reducing deferred maintenance. I developed these categories based on information I developed from a review of the documents and literature. I created codes and completed MS Word searches to determine word frequencies, which I used to further refine the categories of information based on the interview data.

In grouping category elements, I identified emerging themes or repeating codes or group of codes in accordance with Saldana's (2015) processes. Themes are discrete categories based on participant answers to a specific question that logically align with other participant responses where sufficient data exists to determine a pool of congruent or similar responses. To draw conclusions, I established themes determined during the coding process and synthesized the responses using the MS Word search tool into a homogeneous reflection of the data (Saldana, 2015).

I performed a constant comparison method, refined the dimensions of the existing codes, and identified new codes. To code the responses, I inductively reflected on the experiences of the participants and ensured the data obtained fit the intended use; correctly representing the real-world construct-comparisons to the state of completeness, validity, consistency, timeliness, and accuracy (Saldana, 2015). I repeated this process to ensure

consistency in the data collection process across the 3 sample cases to create uniformity and mitigate bias (Smith & Noble, 2014). I did not manipulate the data collection tools (Noble & Smith, 2015). Through analytical reflection I allowed lessons learned and best practices to evolve using the qualitative interrogatories of *who, what, when, why, and how.*

Denzin and Lincoln (2011) noted that there are three subsets of triangulation based on time, place, and person. I used methodological triangulation to validate the data collected from one participant with other participants in this study. I further explored and matched the data from the participants' interviews with data from their college budget and program documents. In addition, I continued to search the literature for new material (including new studies published since writing the proposal) pertinent to the key themes of the study until the study was completed and ready for approval. I correlated the key themes with the literature and the theoretical/conceptual framework of this study and updated my literature section. Once I received all of the responses from the participants, I reviewed their comments to determine if the elements in the change model (See Figure 1) were present in the experiences of the participants. In all cases, the elements of the change model were present in their experiences and responses. I subsequently followed-up with participants and did member checking to validate data as part of the triangulation process (Marshall & Rossman, 2016; Harper & Cole, 2012).

Reliability and Validity

There are valid reasons why a researcher should focus on the approaches used to report reliability and validity in a qualitative study (Street & Ward, 2012). The concepts of reliability and validity in qualitative research are different from those used in quantitative

research and are synonymous with trustworthiness, quality, and creating confidence in the findings (Noble & Smith, 2015). These qualitative characteristics are more formally described as *dependability, credibility, transferability, and confirmability* (Marshall & Rossman, 2016). Quantitative researchers use tests to determine the value of empirical social research in a quantitative study: construct validity, internal validity, external validity, and reliability (Yin, 2014). However, for this qualitative multicase study I did not use construct validity, external validity, and reliability tests since internal validity has less relevance in qualitative case studies (Prowse & Camfield, 2013). Understanding the models of reliability and validity in qualitative research is essential to the quality and integrity of the data collected (Noble & Smith, 2015). Researchers should ensure that they develop accurate conclusions from the data and the research design, and this is evident in the research by the quality of the study and the adherence to objective research practices (Frels & Onwuegnzie, 2013).

Dependability

The theory of reliability in a qualitative study includes quality, rigor, and trustworthiness of the collected data with the notion that if the researcher conducted the case study a second time, the same result of findings and conclusions would appear (Van Manen, 2014). Yin (2014) summarized this concept of reliability as a process that is consistent and repeatable. The principle requirement within research that reliability fulfills is to mitigate against errors and bias (Yin, 2014). The researcher should not only record in detail the processes to obtain the data, but also create a database that helped reduce any errors or bias in the study (Noble & Smith, 2015). I documented each step of the data collection process

precisely by using a checklist that outlines essential steps that I followed (See Appendix D). I provided a detailed protocol for administrating the questions in Appendix B.

Bias does affect the research process and therefore it is essential that the researcher manage his or her bias to reduce the risk of negatively affecting the reliability of the study (Smith & Noble, 2014). To improve reliability a researcher should create and record detailed steps as part of the process map that allows future researchers to replicate the study using the same case (Yin, 2014). I created a repeatable process, which I documented in the protocols (See Appendix B, C, and D). Case study protocols and databases are two tactics suggested by Yin (2014) to improve reliability. Noble and Smith (2015) described qualitative reliability as procedural consistency and transparency that is free of personal bias. I used case study and databases as recommended by Yin to ensure reliability and minimize errors and bias.

Yin (2014) offered that to ensure dependability, researchers review multiple data sources or evidence as part of the process. In this research, I had multiple participants who offered their opinions and perspectives in response to the same questions. I provided written copies of the six interview questions to ensure consistency and I read the questions without an emotional tone to each of the participants. I waited for the participant response and repeated their response as a component of member checking to ensure the dependability and accuracy of the statements. Member checking at this stage of the interview process also helped me ensure the response relevant to the central research question. I then used probing follow-up questions to ensure I had data saturation. Lincoln and Guba (2013) recommended that researchers use a repetitive process for data collection to mitigate against procedural threats and improve reliability. The process for data collection is repeatable since I used

semistructured interview questions, which allows for probing questions that I recorded and transcribed verbatim. The transcription of all questions and responses ensures future researchers may replicate this research. In addition, I used multiple documents from each college to review the effect of facility maintenance operations on the college mission. I triangulated the two data sources (Denzin & Lincoln, 2011).

Credibility

Noble and Smith (2015) described qualitative validity as a reflection of precision and accuracy of the data, which makes the data trustworthy. Marshall and Rossman (2016) provided a definition for research credibility as the value and believability of the data or finding. Researchers can create credibility by using the techniques of member checking, participant transcript review, and triangulation (Marshall & Rossman, 2016; Noble & Smith, 2015).

Van Manen (2014) opined that constant member checking would enhance the trustworthiness and confidence of the data in qualitative research. Constant member checking means that one should continuously go back to the participant to verify that the themes developed from their data are correct. I conducted constant member checking by contacting the sample participants after I interviewed all of the participants to verify what they intended to convey in their responses to the questions. When a new theme was determined, I validated this new theme by contacting the participants and verifying that the new theme was consistent with their responses.

Based on the requirements established by Marshall and Rossman (2016), I compared responses of the participants within colleges and cross-checked responses against the same

type of participants at other colleges to ensure credibility. I analyzed the responses through this comparitive analysis technique to ensure responses were within the domain of community college decision making, which conforms to the concept of believability (Noble & Smith, 2015). I ensured the responses were pertinent to the subject of the research, which also aids in the creation of credibility and trustworthiness of the data.

In addition to member checking, I also used methodological triangulation of the interview data with the colleges' plans and documents. Verner and Abdullah (2012) stated methodological triangulation improves the validity of the case study findings. The document such as facility master plans, accreditation responses, and educational master plans should provide indications of actions community college leaders took to implement their facility operations and maintenance strategies. I triangulated these documents against the data I collected during the semistructured interview process, which allowed me to validate the credibility of the participant data.

Transferability

Houghton et al. (2013) noted that research transferability requires sufficient detail for all the recipients to understand and determine the applicability of one set of information to apply or be transferable in another circumstance or activity. Marshall and Rossman (2016) advised that the researcher and the reader should determine the applicability and transferability of the research outcomes to other populations and situations. I identified the basis of broad themes from a variety of stakeholder-participants and allowed for knowledge transfer from their individual experiences. However, the responses from participants might be transferrable only to other large California community colleges since this was the sample

population and the individuals within California use the similar regulations and criteria for facilities operations and maintenance (California Community College Chancellor's Office, 2015b; Collins, 2011; Taylor, 2014). The study sample was too small and unique (only three large community colleges) to be transferable to other state community colleges or other institutions of higher education.

Confirmability

Confirmability and dependability are similar, and confirmability refers to the neutrality and accuracy of the data (Cope, 2014). Confirmability further requires the researcher to be neutral or not create bias when collecting and analyzing the interview data (Noble & Smith, 2015). I minimized my interactions with the participants while observing and noting their responses and non-verbal cues. I reduced the opportunity for undue influence by listening rather than having a discussion or debate, which mitigated against my bias affecting their responses. I used an electronic tool in MS Word to assist me in identifying the data and calculating the number of responses relative to each theme (Morse, 2015). I determined the relative themes based on the frequency of occurrence key word synonyms.

Data Saturation

Vaughn et al. (2014) advised that a critical element of data collection and validation occurs when there is data saturation. O'Reilly and Parker (2012) described data saturation as a consequence of when the researcher is unable to generate new information from the sample. The two significant elements in qualitative research regarding data saturation are adequacy of sample size and the appropriateness of the sample to the study topic (O'Reilly & Parker, 2012).

I achieved data saturation by using a small sample size. Vaughn et al. (2014) opined that data saturation occurs when the participant size is sufficient to create a broad range of unique data sets but not so large that one creates unneeded repetitious data. I limited the number of participant groups and individuals within each group, which provided a diversity of unique responses but did not create unnecessary repetition in the data. Of the solicited participants, 100% agreed to complete the interviews.

Transition

The purpose statement, the research methodology, design of the study and the data collections plan; ensuring the reliability and validity of the data are in Section 2. The sample chosen for this qualitative multicase study provided the data needed to explore new strategies for facility maintenance operations in California community colleges that affect the college mission. I used a qualitative multicase study design to create knowledge that might contribute to improve the understanding of strategies being affected by community college leaders to sustain or improve college facility maintenance operations. Additionally, the data acquired also contributed to the understanding of how community college leaders who used these strategy factors affected the college missions.

Section 3 includes the findings, analysis, and conclusions from the results of the study. I considered the applicability of results in recommendations for changes in community college leader decisions. There were implications for social change and I identified topics for future research.

Section 3: Application to Professional Practice and Implications for Change

The focus of this qualitative multicase study was to explore business strategies California community college leaders use to sustain or improve facilities needs to meet the college mission. Community colleges in California continue to experience a decrease in funding, which negatively affects college facility and maintenance operations (Collins, 2011; Taylor, 2014). The analysis of the background information and literature review in Section 1 provided the foundation needed to identify the best methodology and research design to conduct this qualitative study. The purpose statement, the research methodology, design of the study and the data collections plan ensuring the reliability and validity of the data are in Section 2. Section 3 was a comprehensive description of the purpose of the study, the presentation of findings, and outcomes of the study. This section includes (a) applications to professional practice, (b) implications for social change, (c) recommendations for action, (d) recommendations for further research, (e) reflections, and (f) conclusions.

Introduction

The purpose of this qualitative multicase study was to explore the strategies California community college leaders use to sustain or improve facilities maintenance operations to meet the college mission. The central research question that guided this study was: What strategies do California community college leaders use to sustain or improve facility maintenance operations to meet the college mission? California community college leaders need strategies and alternatives to sustain or improve facilities needs to meet the college mission that supports over 2 million students (Taylor, 2014). However, California community colleges CEOs lack the business strategies to sustain critical maintenance

operations needs to meet the mission requirements while maintaining a balanced budget. I identified the following emergent themes using Saldana's (2015) process for coding discriminators: (a) planning, (b) funding, (c) maintenance strategies, and (d) people.

Presentation of the Findings

The central research question that guided this study was as follows: What strategies do California community college leaders use to sustain or improve facility maintenance operations to meet the college mission? I identified the following emergent themes during the data analysis: (a) planning, (b) funding, (c) maintenance strategies, and (d) people. There were 10 participants from three colleges. I identified 135 individual words and phrases from participant responses that I used to create the data. I analyzed the responses and categorized words and phrases using Saldana's (2015) process for coding discriminators to identify themes.

The four themes that emerged from the data collection conformed to scholars' research in the literature and the theoretical framework of the study. Flick (2015) stated that in qualitative research, the researcher might use several theories to create the framework for the study. The participants' data demonstrated the need for the understanding of how some community college leaders had created and implemented strategies that transform and produce change. The statements of the participants aligned with the elements of applied theories of strategy and change as discussed by Chamberlain (2011), Kotter (2012), and Lewin (1951), which were the essential elements of my conceptual framework.

The participants provided almost an equal number of responses reflective of the planning and funding themes. These two themes had the largest number of responses as

depicted in Table 2. There were 135 participant responses from the 10 participants, three participants from CACC#1, three participants from CACC#2, and four participants from CACC#3.

Table 2

Emergent Themes Identified from the Data Collection

Emergent Theme	Number	Percentage of Total
Planning	47	34.8%
Funding	46	33.1%
Maintenance Strategies	33	24.4%
People	9	6.7%

Planning was the number one theme that emerged from the analysis of the data. The planning theme emerged from 47 various participant statements, phrases, and words that were similar in meaning. Planning demonstrates that college CEOs must begin identifying long and short-term business strategies to sustain or improve facilities. However, more participants identified short-term planning strategies than long-term planning strategies. Participant responses to interview questions Q1 and Q3 reflected more often to the theme of planning. All of the participants made at least one remark that suggested planning was a strategy they used. Jain et al. (2014) supported planning as an essential component of leader management of the maintenance function.

CACC#1's and CACC#3's planning documents included priorities based on the California Community College Chancellor's Office system of priorities. These two colleges centrally controlled maintenance and capital projects. CACC#2 used a more decentralized

planning model where individual college presidents could determine priorities for allocating resources. I noted that CACC#2 had a funding model different from CACC#1 and CACC#2. I discovered that the cycle for implementation of plans was longer at CACC#1 and CACC#3 than at CACC#2. Thus, CACC#2 leaders were implementing plans in less time than their colleagues at CACC#1 and CACC#3. Jain et al. (2014) noted that leaders who planned maintenance properly could make a positive impact on the organization and its clients. The literature regarding strategy theory also emphasized planning as a critical component for leader decision making and prioritization of actionable steps (Chamberlain, 2011; Lampel et al., 2014; Mintzberg, 2007).

Mintzberg's (2007) theory regarding strategy denoted strategic planning as a function of deliberate plans about tangible positions leaders take. CACC#1, P-1 stated, "We definitely had a mind towards sustainability, towards contemporary construction and operations design that would reduce the utilities requirements or the maintenance and operations requirements of those facilities". CACC#1, P-2 concluded that:

> Developing sustainable best practices for a service area, you have to plan, plan and plan every day in the facilities area to be able to sustain, little things like not paying attention to maintenance that is required at this point in time could cause a significant amount of resources in the long run.

CACC#2, P-1 noted that plans were a function of recognizing facility attributes, structural capabilities, and matching resources to create actionable responses to changing needs. CACC#2, P-1 asserted that success of planning operations within a college depended upon a leader's ability to create a common vocabulary between the occupants of a facility and

administrators who will implement the plan.

In Table 3, I provide coded responses that various particpants made to different questions that corresponded to the theme of planning. The participants collectively provided 47 responses that focused on the theme of planning. Questions 1, 2, and 3 garnered the most responses that could be coded as responsive to the first theme - planning.

Table 3

Theme 1 – Planning (Response Frequency to a Specific Question)

References	Response to a Specific Question
Theme 1: Q1 Reduce Deferred Maintenance	16
Theme 1: Q2 Improve Deferred Maintenance	9
Theme 1: Q3 Short-term Budget Strategies	13
Theme 1: Q4 Failed Strategies	3
Theme 1: Q5 Long-term Budget Strategies	6
Theme 1: Q6 Additional Information	0

Note: I have abbreviated questions (Q1-Q6).

Funding was the number two theme that emerged from the analysis of the data. The funding theme emerged from 46 various participant statements, phrases, and words that were similar in meaning. Funding is of great concern for California community colleges (California Community College Chancellor's Office, 2015a.). All of the participants noted that the state does not approve and allocate sufficient funds for facility maintenance operations. Collins (2011), Taylor (2014), and Jain et al. (2013) asserted that the organizational demands added a sense of urgency for institutional leaders to find strategies

for reducing the costs of maintenance and funding alternatives to ensure sustained mission outcomes. The data in the budget documents for CACC#1, 2, and 3 indicated the colleges had reduced the amount of money allocated to maintenance and none of the college budgets included general fund dollars for capital improvements. These colleges used bonds and state categorical funding to support plans for capital improvement, sustainability, maintenance operations, infrastructure, instructional technology, and reduction of deferred maintenance.

Researchers did not emphasize funding as a critical dimension of strategy development or change implementation component of theories regarding strategy (Chamberlain, 2011; Lampel et al., 2014; Mintzberg, 2007) and change (Kotter, 2012; Lewin, 1951). However, one might consider funding under the list of motivators that Chamberlain (2011) discussed as the second factor in strategy development. Funding was one of the most relevant motivators mentioned by the participants. CACC#1, P-2 stated, "Lack of resources, is the number one cause leading to poor maintenance of facilities". CACC#2, P-2 stated, "A part of any strategy for sustaining institutional facilities' maintenance is going to be funding, budgeting properly and part of that budget has to be informed by data." CACC#2, P-3 stated:

> We are still forced sometimes to perform a triage type of operation where you have to make some difficult choices, and you have to sometimes choose not to address an issue that you would rather address, but rather to focus your resources on a different issue that an assessment reveals will have a more urgent or critical impact.

Collins (2011) and Taylor (2014) asserted that funding was the critical factor influencing California community college leaders' decisions regarding strategies to sustain facilities and

maintenance operations. My research substantiated these prior claims.

In Table 4, I provided coded responses that various particpants made to different questions that corresponded to the theme of funding. The participants collectively provided 46 responses that focused on the theme of funding. Questions 1, 2, and 3 garnered the most responses that could be coded as responsive to the second theme funding.

Table 4

Theme 2 – Funding (Response Frequency to a Specific Question)

References	Response to a Specific Question
Theme 2: Q1 Reduce Deferred Maintenance	14
Theme 2: Q2 Improve Deferred Maintenance	14
Theme 2: Q3 Short-term Budget Strategies	8
Theme 2: Q4 Failed Strategies	2
Theme 2: Q5 Long-term Budget Strategies	5
Theme 2: Q6 Additional Information	3

Note: I have abbreviated questions (Q1-Q6).

Maintenance strategies was the number three theme that emerged from the analysis of the data. The maintenance strategies theme emerged from 33 various participant statements, phrases, and words that were similar in meaning. CACC#2, P-3 stated that the "availability of facilities has an incredible impact on institutional effectiveness, student learning outcomes…and what we're here to do and deliver, and unfortunately there's not always an understanding of how direct that impact can be." Maintenance strategies can be essential in reducing operational downtime of facilities (Wahmare et al., 2014). Leaders of

community colleges who can reduce the downtime of facilities may improve the teaching learning success of students (Collins, 2011; Swanson, 2001).

The strategic plans for the three colleges included minimal references to facilities. The educational master plan for the three colleges included strategies and plans for instructional technology and space for future enrollment growth. However, the educational master plans did not prioritize these requirements and did not specify how college leaders would fund their current and future projects. College leaders did prioritize projects, including deferred maintenance and some routine maintenance projects for large cost items like chiller replacements. The three colleges included in the facility plans a reference to life cycle costs. CACC#1 and CACC#3 leaders stressed in the facility plans the value of using community and industry partners to help develop and fund capital and instructional expansion projects.

CEOs lack the business strategies to sustain critical maintenance operations to meet the college mission (Collins, 2011). Rahman et al. (2014) asserted that few leaders had implemented maintenance strategies for the cost of sustaining equipment. Often organizations purchased new equipment at a high cost with no strategy of how to maintain the equipment (Rahman et al., 2014). Although some scholars consider TPM as more than a key operational activity (Jain et al., 2014; Rahman et al., 2014), this was not one of the techniques mentioned by any of the participants of the study. Some participants did discuss other strategies like preventative maintenance and mean time to failure, used by other business and manufacturing industry leaders to help analyze and mitigate the risk of equipment and facility failures (Wahmare et al., 2014).

Wahmare et al. (2014) asserted that leaders could improve the performance and

extend the life cycle of equipment and mechanical systems. Participants did not specify all of the 8 Pillars of TPM identified by Wahmare et al.; however, their responses did include the following seven of the eight pillars (a) facilities and equipment must be clean and organized, (b) autonomous maintenance, (c) continuous improvement, (d) planned maintenance, (e) quality maintenance, (f) education and training, and (g) safety, hygiene, and environmental control. Wahmare et al. (2014) also identified the need for an office of TPM, which the participants did not include.

The participants' documents and interview data aligned with the strategy form denoted in the literature as *proactive* or *preventative* in nature. Six of the 10 participants discussed the use and need for preventative or scheduled maintenance as a strategy they used. This strategy approach is one that Swanson (2001) described as a use-based strategy, which leaders can use longitudinal data of facility systems and equipment to determine the optimum time to change or replenish something prior to the likely time a failure will occur.

Theories regarding strategy (Chamberlain, 2011; Lampel et al., 2014; Mintzberg, 2007) and change (Kotter, 2012; Lewin, 1951) would have incorporated the elements of maintenance strategy as a critical dimension of strategy development and change implementation. For example, I illustrated in the integrated model of Kotter and Lewin (See Figure 1) what steps leaders must use to guide teams and unfreeze the organizational thinking to create change. CACC#2, P-3 confirmed the importance of the change theory and stated, "It was a very major undertaking to shift that paradigm, bargaining unit employees, we had to get the labor relations committees involved, to move our folks from that dedicated specialist paradigm into a generalist paradigm." Leader participants asserted that transforming the

culture of their institutions and the people was a significant challenge that required them to be transparent and inclusive in the planning and budgeting processes. However, participants noted that constituents were less interested in maintenance strategies. Participants asserted that the stakeholders were interested in how the money was spent and where the money came from.

In Table 5, I provided coded responses that various particpants made to different questions that corresponded to the theme of maintenance strategies. The participants collectively provided 33 responses that focused on the theme of maintenance strategies. Questions 1, 2, and 3 garnered the most responses that could be coded as responsive to the third theme - maintenance strategies.

Table 5

Theme 3 – Maintenance Strategies (Response to a Specific Question)

References	Response to a Specific Question
Theme 3: Q1 Reduce Deferred Maintenance	8
Theme 3: Q2 Improve Deferred Maintenance	7
Theme 3: Q3 Short-term Budget Strategies	12
Theme 3: Q4 Failed Strategies	4
Theme 3: Q5 Long-term Budget Strategies	4
Theme 3: Q6 Additional Information	0

Note: I have abbreviated questions (Q1-Q6).

People was the number four theme that emerged from the analysis of the data. The people theme emerged from nine various participant statements, phrases, and words that were similar in meaning. Carnero (2014) stated that until the last decade, business leaders had not considered maintenance as an important factor in the productivity and competitive advantage of an organization. A major factor in implementing this type of strategy includes two key components – human orientated and process orientated strategies (Bhalerao, Kale, Bhalerao, & Mahire, 2014). The human oriented component may be the more difficult of the two components for managers to implement because it requires change (Attri et al., 2013; Bhalerao et al., 2014). Knowing the barriers, allows managers to implement strategies that have positive effects on maintenance operations (Attri et al., 2013). People, the fourth theme identified, reflected the need for understanding the importance of morale and direct impact that facilities and maintenance operations have on students, faculty, and staff performance. However, none of the college planning documents included strategies that directly aligned with professional development or other morale building strategies.

Chamberlain (2011) asserted that stakeholders were a critical component of strategy development. Thus the emergence of the theme, people, was consistent with the theoretical framework of the study. CACC#1, P-2 noted that their "governing board is forming a facilities committee . . . and they're going to be reviewing everything . . . necessary . . . to sustain what we currently have and that will build additional buildings in the future." CACC#2, P-3 provided, "It was a very major undertaking to shift that paradigm, bargaining unit employees, we had to get the labor relations committees involved, to move our folks from that dedicated specialist paradigm into a generalist paradigm." CACC#3, P-3 stated,

"We have so many different variables here on the college, but by us working together, utilizing the staff, the resources that we have . . . an opportunity to continue to prepare and plan." Communication, training, and stakeholder engagement are components of this theme. Although participants did not make as many direct responses that tit within the theme of people, there were comments under the other three themes that were indirectly related to people as a factor of planning, funding, and maintenance strategies.

In Table 6, I provide coded responses that various particpants made to different questions that corresponded to the theme of people. The participants collectively provided 9 responses that focused on the theme of people. Questions 1, 2, and 3 garnered the only responses that could be coded as responsive to the fourth theme - people.

Table 6

Theme 4 – People (Response Frequency to a Specific Question)

References	Response to a Specific Question
Theme 4: Q1 Reduce Deferred Maintenance	4
Theme 4: Q2 Improve Deferred Maintenance	3
Theme 4: Q3 Short-term Budget Strategies	2
Theme 4: Q4 Failed Strategies	0
Theme 4: Q5 Long-term Budget Strategies	0
Theme 4: Q6 Additional Information	0

Note: I have abbreviated questions (Q1-Q6).

In Table 7, I provide a comprehensive overview of the themes derived from each question. The theme of planning was most evident in Q1, Q2, and Q3. The theme of funding

was most evident in Q1, Q2, and Q3. The theme of maintenance strategies was most evident in Q3. The theme of people was only present in Q1, Q2, and Q3.

Table 7

Frequency of Each Theme by Question

	Planning		Funding		Maintenance		People		Totals
Q1	16	38.1%	14	33.3%	8	19.0%	4	9.5%	42
Q2	9	27.3%	14	42.4%	7	21.2%	3	9.1%	33
Q3	13	37.1%	8	22.9%	12	34.3%	2	5.7%	35
Q4	3	33.3%	2	22.2%	4	44.4%	0	0%	9
Q5	6	46.2%	5	38.5%	2	15.4%	0	0%	13
Q6	0	0%	3	100%	0	0%	0	0%	3

Applications to Professional Practice

The findings of the study were relevant to the professional business practices of large California community colleges. Leaders of community colleges have the same responsibilities of any business enterprise to be fiscally prudent and to sustain the infrastructure needed to affect success in their mission. The qualitative findings of the study support the quantitative findings of Collin (2011) and the data in the reports developed by Taylor (2014) that leaders need strategies to sustain California community college facilities and maintenance operations. California community colleges are facilities based enterprises and therefore community college leaders of these organizations must sustain the teaching learning platform - classroom and laboratory buildings (Collins, 2011; Taylor, 2014). California community college facility and maintenance operations play a critical role in

supporting the mission and success of these institutions. However, leaders need to develop buy in from all of the constituencies to affect change in how they use resources to sustain the facilities and maintenance operations.

The findings in this study coincide with the research of Taylor (2014) who noted that some community colleges were in need of renovating facilities and upgrading instructional materials and equipment, and their leaders struggle to find additional funding sources for these expenses. One consequence of community colleges experiencing a decrease in revenues is that community college leaders decide not to fund items such as facility maintenance or the purchase of equipment (Hunter, 2013). A major underlining factor raised by Taylor (2014) and affirmed in this study was that community college leaders failed to have long-range plans to sustain facilities and maintenance operations. Participants from all of the colleges advised there was a lack of long-range plans at the state and local levels that provided stability for operations. Leaders noted that planning was the critical factor for sustainable operations, which supported research conducted by Collins (2011) and Gopalakrishnan et al. (2015).

I discovered during the analysis of the findings that strategies and decision making varied based on organizational design - centralized versus decentralized organizational designs differed in how leaders determined strategies to create successful facilities and maintenance operations. I could not determine the effect of organizational designs on leader decision making and strategy development. Participants did note that the relationships within the organizations and the organizational design could influence the type of strategies created and implemented. A leader's motivation is a component of the strategy theories of Mintzberg (2007) and Chamberlain (2011).

CACC#2 uses a multicollege district that has a decentralized model, which allows the senior leaders of that district to manage resources independently. The decentralized model provided the freedom of senior leaders to address directly facility and maintenance operations. The other positive element of the decentralized model was the ability of senior leaders at the college level to respond quickly to facility and maintenance issues and correct problems before they worsen, thus sustaining operations and minimizing costs. Although in some instances this flexibility was a positive factor, constituent groups could undermine a college leader's decision and could change priorities and reallocate funds.

CACC#1 and CACC#3 are mulitcollege districts, which have centralized facility and maintenance operations models for decision making and response. Senior leaders at the local colleges within these districts did not control the functions of construction, repairs, maintenance planning and scheduling, and facility capital programs. The positive elements for these centralized models were leveraging of resources, equipment, staff, and a reduction of overhead. The negative element of this model was the competitive nature of the need prioritization that district colleges competed for limited resources and the lack of control by college senior leaders.

I did not uncover data that support a specific organizational design strategy, centralized or decentralized, which enables leaders to be more or less successful. I did not focus the scope of the study on organizational design. Based on the limited amount of data, I noted that both organizational models had challenges but college leaders could successfully use either one.

Implications for Social Change

Community college leaders in California will get additional substantiation from the findings of this study. Planning, funding, maintenance strategies, and people are key factors in effective strategies to sustain or improve maintenance and facilities. Senior leaders at three large California community colleges provided insight of strategies for successful facility and maintenance operations that affect the teaching and learning mission in a positive manner. Strange and Banning's (2015) research supports this finding. These strategies have resulted in reduced costs and increased revenues through retention of students, positive changes in student outcomes, community economics, and improved college operations. With over $1 billion in deferred maintenance and only $87.7 million provided in the California 2014-2015 budget for 72 college districts, eroding facilities could negatively affect the mission of California community colleges (Taylor, 2014). Collins (2011) noted that failure to reduce deferred maintenance could undermine the mission of community colleges and affect the economies of the communities these colleges serve.

Community college leaders make decisions that affect millions of students and the economic wellbeing of the communities they serve. California community colleges serve over 2 million students and affect one of the largest economies in the world (California Community College Chancellor's Office, 2015a). Community colleges are one of the principle economic engines of the United States and the effects of change on how community colleges do business is a result of how leaders develop and use resources (Hillman & Orians, 2013). Prior to my study there was little information, research, or data on community college leadership strategies used to sustain and improve maintenance and facilities operations in

California (Collins, 2011). The results of this study might fill gaps in the understanding of effective practices of community college strategies that leaders develop and implement regarding maintenance and facility operations.

One of the significant findings in the study was that energy efficiency and sustainable design of facilities reduced costs and demonstrated institutional leadership for the communities they serviced. This finding aligns with the strategies outlined by Collins (2011) regarding the need for integrating sustainability into contemporary construction and operations design that would reduce the cost of utilities and maintenance operations. College leaders identified the need for energy efficiency and sustainable design in college documents I reviewed, which supported the data gathered during the interviews.

Improvements to facilities can help leaders attract and retain students (Collins, 2011; Strange & Banning, 2015). Community colleges create the opportunities that have the general effect of enhancing individual life by promoting the worth, dignity, and development of individuals, communities, organizations, institutions, cultures, and societies (Cohen & Kisker, 2014). Long-term planning and budgeting by community college leaders could enhance the teaching learning environment of colleges (Strange & Banning, 2015) and reduce the growing deferred maintenance debt (Taylor, 2014). When coupled with maintenance strategies and personnel skill development, college leaders could create a sustainable strategy to enhance their college mission.

Recommendations for Action

I used a qualitative descriptive multicase study to explore and reveal what strategies California community college senior leaders needed to achieve sustainability of facility and

maintenance operations, and support their mission. California community colleges educate the largest undergraduate student population in the United States (Cohen & Kisker, 2014). California CEOs and senior leaders can benefit from the findings developed in this study. It is possible that other community colleges, especially large urban colleges, might find similarities in the challenges and findings of the participant colleges in this study.

There were four specific recommendations that I derived from the themes that emerged from this research. First, senior leaders should create plans that can be implemented. The data confirmed that planning and integrating actionable functions, like budgeting, are part of community college leader strategies, which is supported by Mintzberg's (2007) process of strategy (See Figure 1). I confirmed through the triangulation of data, literature, and college documents that planning was essential to ensuring sustainability of facilities and maintennce operations in a way that supports the college mission, attracts students, and retains students. Second, senior leaders should integrate facility and maintenance operations requirements into their unit plans and budgets as part of the fixed cost of annual institutional funding. Third, since maintenace strategies are evolving, senior leaders should review the best practices of business and industry to adapt facility and maintenance processes that create the best scheduling for preventative and sustainable facilities using the least amount of resources. Fourth, senior leaders should provide all constituent groups professional development so people understand the value of sustaining facility and maintenance operations. These people, when given the proper training and needed skills to participate in the discussion of resource allocation, can be more productive and create a teaching-learning environment that enhances the college mission.

I will submit a proposal to present my findings and recommendations at the next Community College League of California (CCLC) statewide association meeting and at the next American Association of Community Colleges (AACC) convention. I will provide the participants with an overview of the results and findings. I will also send a completed copy of the doctoral research study when published, if it is of interest to them. I hope local, state, and federal government agencies review the results and findings of the study, and determine if policy changes are needed to support community colleges.

Recommendations for Further Study

The primary limitation of this qualitative multicase study was the location of the sample size of the participants. Recommendations for further study would be to include other colleges in California, especially rural and small colleges to determine if the size and location or environment of a college has any effect on the findings. In addition, researchers could study this topic in states other than California. Employing a quantitative research method that assesses the relationship between the four themes and facility maintenance operations might allow leaders to assess the relationships of these factors to improve decision making. I also recommend conducting a future quantitative study of faculty and staff to validate the effect of facility and maintenance operations on their behavior and success.

This study was limited to California Community Colleges where the State Chancellors office designates and allocates deferred maintenance funding for each college. While the state provides these allocations to the colleges, the funds are not sufficient to maintain facilities and operations. Community college leaders could gain additional insights by studying states where colleges do not receive designated funding for deferred maintenance

and operations. This type of study would help identify how colleges designate maintenance and facility funding, and whether they budget enough funds to sustain and improve facilities and maintenance operations.

Reflections

I have greatly appreciated my DBA Doctoral experience. I have become a scholarly writer and better researcher not only in my studies but in my professional career as well. I have gained extensive knowledge from my research – specifically on budgeting, deferred maintenance, operations, education master plans, facility master plans, and total cost of ownership. I also learned the importance of following proper protocols (Appendix B & C) so that any bias or predetermined opinions were mitigated (Smith & Noble, 2014) during the process of gathering data. Although this study focused on the process of strategy development, my interactions with the participants has greatly enhanced my understanding of leaders making decisions on the process of strategic development. I found that the participants had the extensive knowledge base about planning and strategy development. I substantiated this from the evidence I found in the documents I reviewed. However, leaders were not always able to implement these plans. Leaders noted that because they lacked resources and institutional support, it made it difficult for them to support employees and professional development needed for successful strategy implementation. While I have had a career in facilities, this study has changed the way I will conduct future facilities operations and strategic planning.

Summary and Study Conclusions

The purpose of this qualitative multicase study was to explore the strategies California community college leaders use to sustain or improve facilities maintenance operations to meet the college mission. The population included senior administrators (chancellors, presidents, vice chancellors, vice presidents of business, facility operations, and executives of facility management and planning) from three large California community colleges who used strategies to address sustaining or improving their facility maintenance operations. Data sources included (a) semistructured interviews, (b) college documents review, and (c) literature reviews. In this section, I presented the findings and emergent themes from the analysis I conducted based on Saldana (2015) processes. The four themes that emerged were (a) planning, (b) funding, (c) maintenance strategies, and (d) people. I also presented implications for social change, recommendations for action, and recommendations for future research. Perhaps CACC#2, P-3 made the best conclusive statement gleaned from this research:

> I think unfortunately, the impact of these issues is often overlooked institutionally and that leads to some very regrettable outcomes because again, condition and availability of facilities has an incredible impact on institutional effectiveness, student-learning outcomes. You know all of our core values and what we are here to do, and deliver . . . unfortunately there's not always an understanding of how direct that impact can be.

This statement, like the research of Strange & Banning (2015), further substantiates that the physical environment can make a difference in sustaining student success.

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Appendix A: Letter of Consent and Confidentially Agreement

Dear _____:

I am Virginia Parras, a doctoral student at Walden University. I have been approved by the university to conduct my research and data collection (IRB Approval #04-01-16-0467641, expires 3/31/17). You are invited to participate in a research study.

Purpose of the Study

The purpose of this qualitative multicase study is to explore business strategies some California community college leaders use to sustain or improve facilities needs to meet the college mission.

Criteria for Selection of Participants

Participants will be volunteer individuals of senior administrators of three large community colleges from the State of California who have knowledge about facility operations and maintenance. I define these senior administrators as chancellors, presidents, vice chancellors, vice presidents of business, facility operations, and executives of facility management and planning.

Voluntary Participation

Your participation in this study is voluntary and no compensation will be provided to you or your institution. The interview will consist of six open-ended questions. I believe you can answer each question in about 2-5 minutes, which means you should be done in about 20-30 minutes depending on the length of your response. This interview will be audio recorded so that I may subsequently transcribe it verbatim. Upon completion of the transcript, I will

contact you to verify (member checking) that I have completely and accurately documented your responses. This step should not take more than 15 minutes.

Although I do not anticipate that any of your responses or your participation in this study will create any potential psychological, relationship, legal, economic/professional, physical, or other risks to you or your institution, there could be some. Therefore, I will maintain your confidentiality and code your identity to ensure I have mitigated the risk as much as possible. I will respect your decision of whether or not you want to participate in the research study. If you decide to join the study now, you can still change your mind at any time. If you are stressed during this study, you can stop at any time. You can skip any question(s) that you contend are too personal. The results of this study could be published; however, your name or organization will not be used, and the results will be maintained in strict confidence. Please review the Consent Form and let me know as soon as possible if you would like to participate. Should you decide to participate, reply to this email and I will contact you to schedule an appointment at your convenience. You may elect to do the interview face-to-face, telephonically, or via Skype.com – the preference is yours. If you like, I will conduct the interview at your office or a place of your choosing.

Confidentiality Agreement

The researcher conducting this study will not disclose any confidential information pertaining to this study. Confidential information shall include all data, financial facts, numbers, statics, or records, and participants' personal identifiable information such as names, characteristic, and responses or submitted, in writing, via the internet, or by any other

media to other parties. I will retain the study data for five years, as per the requirements of Walden University, after which I will destroy the data.

Benefits of the Study

There is little information, research, or data on community college leadership strategies used to sustain and improve maintenance and facilities operations in California. There are no qualitative studies on California community college maintenance and facilities operations strategies that sustain and improve maintenance operations. The results of this study might fill gaps in the understanding of effective practices of community college strategies that leaders develop and implement regarding maintenance and facility operations.

Contact Information and Questions

Do you have any questions? If you have questions later, you can contact the researcher. If you want to talk privately about your rights as a participant, you can call a Walden University representative (1-800-925-3368) who can discuss this with you. The Walden University approval number for this research is 04-01-16-0467641, and the expiration date is March 31, 2017.

Statement of Consent

I have read the information and feel I understand the research well enough to make a decision about my involvement. By reply to this email with the words ‘I Consent’, I am agreeing to participate. You may print or save a copy of this consent form for your records.

Appendix B: Protocol for Administration of Research Question Interviews

The purpose of this protocol is to provide future researchers the guidance to enable them to replicate this research. The procedure will consist of following defined steps that I will take:

Steps:

1. Review the public email lists of all CEOs and senior leaders at the colleges in California, which represent the cases to be studied.
2. I will determine if there is a specific process other than public records requests for obtaining school documents and make such request as needed based on the college protocol.
3. Review the interview questions for accuracy and precise replication of research questions.
4. Revise any ambiguous or double-barreled questions prior to the interviews.
5. Individually send emails to all of the prospective participants to ensure confidentiality of each participant with a copy of the interview questions so they may review the question and be prepared to respond. This should help minimize the length of the interview and demonstrate I appreciate their giving of their time.
6. Schedule the interview and use the preferred method of the participant, face-to-face, telephonic, or Skype.
7. Record each participant decision regarding their desire to voluntary participation in the study.

8. I will begin each interview session greeting and salutations and I will introduce myself to the research participant. I will allow the participant to introduce himself or herself and then I will introduce the research topic by reading the problem and purpose statements and central research question.
9. I will then give the participant a copy of the questions and inform them that I will be taping the session so their responses can be transcribed verbatim.
10. I then ask permission of the participant to turn on the tape recorder and note the time, date, and place of the interview. If they say no, then I will thank them and end the session. If they agree to the tape recording, then I will ask them to start by reading the question aloud and making their response.
11. I will not interrupt the participant but will ask probing follow-up questions for clarity and to ensure data saturation by asking - Is there anything you would like to add.
12. Upon completing all of the questions, I will then record the fictitious code for the participant.
13. I will thank the participant for taking the time to respond to the invitation to participate.
14. I will send thank you letter email to all participants and let them know how they may receive the results of the findings upon approval of the doctoral study.

Appendix C: Interview Protocol and Questions

Purpose of the Study: The purpose of this qualitative multicase study is to explore business strategies some California community college leaders use to sustain or improve facilities needs to meet the college mission.

Interview Protocol and Steps: The interview session will commence with greeting and salutations, introducing myself to the research participant, after which I will introduce the research topic.

1. I will thank the participant for taking the time to respond to the invitation to participate.

Good (morning, afternoon, or evening). I am Virginia Parras, a doctoral candidate for the degree of Doctorate of Business Administration (DBA) from Walden University. Thank you for the consideration you are giving me and the time you have willingly allow for this interview regarding my study. I have been approved to conduct this study by the Walden University's Institutional Review Board for Ethical Standards in Research (IRB). The reference for the approval is #04-01-16-0467641. The interview will span approximately 20-30 minutes for responses to the six interview questions, including any additional probing follow-up questions.

Although I do not anticipate that any of your responses or your participation in this study will create any potential psychological, relationship, legal, economic/professional, physical, or other risks to you or your institution, there could be some. Therefore, I will maintain your confidentiality and code your identity to ensure I have mitigated the risk as much as possible. I will respect your decision of whether or not you want to participate in the research study.

2. I will request the participant acknowledge that they have read the consent form and they have volunteered to participate in this study.

Consent Form. I previously sent you a copy of the consent form, which you may print or save a copy for your records. However, here is a copy just in case you do not have it with you. Please take a moment to review the form and let me know if you are willing voluntarily to continue this interview. I will give the participant a copy of the consent form for their records.

3. Please acknowledge your consent to have this interview recorded. The purpose of the recording is to ensure that I can accurately and completely transcribe your responses. If you concur, I will turn on the tape recorder and note the date, time, and location. Upon completion of the transcript, I will contact you to verify (member checking) that I have completely and accurately documented your responses. This step should not take more than 15 minutes.

Please acknowledge your consent so that it can be recorded.

4. The coded sequential interpretation of the participant's name e.g., P#X, CACC#X respondent will be indicated on the audio recorder (or electronic storage device), documented on my copy of the consent form and the interview will begin.

Please read and respond to the interview questions.

Let us start with the first overarching question:

a. What strategies do you use to sustain institutional facility maintenance and reduce deferred maintenance?

b. What strategies do you use to improve institutional facility maintenance and reduce deferred maintenance?
c. What short-term strategies have you implemented for sustaining facilities operations?
d. What strategies failed to sustain institutional facility maintenance and reduce deferred maintenance?
e. What long-term budget strategies have you implemented for facilities operations?
f. What additional information would you like to share that we have not addressed on this topic?

5. At the end of the interview, I will thank the research participant for taking the time to participate in the study.

Appendix D: Protocol for Enhancing Reliability and Validity of Themes

1. Review and verify the results of each question to ensure it is not a double barreled or ambiguous question.
2. Any skipped question(s) will be noted and accurately discussed in the findings.
3. Transcribe accurately each participant response and verify by listening to each recording twice.
4. Create a topical theme scheme to organize the data into the following categories:
    a. Maintenance Operations Strategies
    b. Minor Repair Strategies
    c. Deferred Maintenance Strategies
    d. Scheduled Maintenance Strategies
    e. Other: Decisions that do not meet any of the above decision criteria