ABSTRACT

TRANSITIONING TO GREEN: IMPLEMENTING A COMPREHENSIVE ENVIRONMENTAL SUSTAINABILITY INITIATIVE ON A UNIVERSITY CAMPUS

By

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Environmental sustainability has become increasingly relevant to institutions of higher education in recent years. Although there may be general support for environmental sustainability on many college and university campuses, it can be challenging for educational leaders to effectively implement comprehensive green campus initiatives. Change in higher education is described by scholars as slow and difficult. This makes it complicated, on many levels, to effectively implement environmentally sustainable policies and practices in institutions of higher education. Although literature articulates the context of environmental sustainability in higher education and describes associated green practices, little addresses the process of how green campus initiatives are implemented in higher education. Through a combination of interviews, observations, and document review, this case study explored how a university implemented a comprehensive environmental sustainability initiative.

The conceptual framework for this study, a hybrid between a nested model of sustainability and Bolman and Deal's Four Frames model, provided a lens through which educational leaders can view the complexities involved with implementing green campus initiatives. This conceptual model emphasized the economic, social, and environmental dimensions of sustainability as well as the role of structural, human resource, political, and symbolic practices in realizing change for sustainability. Triangulation of data demonstrated that Coastal Bluff University (CBU) employed a number of strategies to overcome the obstacles inherent in this implementation process. Three emergent themes provided an organizational structure for this case study's description: Greening of Worldviews, Improving Green Campus Practices, and Leading a University-Wide Effort.

CBU implemented a comprehensive environmental sustainability initiative by engaging in an on-going, iterative institutional change process. CBU's approach to campus greening united ethics and pragmatism to drive campus decision making. This approach resulted in changes to campus operations, such as recycling, generating renewable energy, and irrigating with reclaimed water. Moreover, CBU expanded academic degree programs in this area and infused sustainability across the curriculum. This transition to green was the result of a concerted effort to re-think the goals of the university, plan with the well-being of current and future generations in mind, and commit funding to initiatives that could demonstrate economic, social, and environmental benefits.

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INTRODUCTION

As we move into this new decade, the need for a transition toward an environmentally sustainable future becomes more evident every day. As the environment becomes increasingly degraded, the global economy continues to suffer, and issues of social disparity become more pronounced, it becomes increasingly clear that radical changes are needed in order for our environmental, economic, and social systems to recover and thrive (Edwards, 2010; Hawken, 2007; Orr, 2011; Shiva, 2005). In order for the transition to an environmentally sustainable future to be successful, people need to become more educated about the essential concepts of environmental sustainability as well as how to integrate green practices into our institutions and our personal lives (Bardaglio & Putnam, 2009; McKenzie-Mohr, 2011; Orr, 2004). This education is provided by a variety of sources and is disseminated widely both nationally and internationally. However, institutions of higher education are arguably in the best position to provide the most significant educational resources about environmental sustainability (Cortese 2003; Creighton & Rappaport, 2007). Some scholars argue that colleges and universities have an ethical obligation to provide this education (Orr, 2004). This way of thinking has led to an ever-growing movement of campus greening in higher education (Bardaglio & Putnam, 2009). Colleges and universities across the globe

Are becoming the catalysts of this change by leading the efforts to transform our colleges and universities into models of environmental sustainability (Edwards, 2010).

This study sought to understand how a university implemented a comprehensive environmental sustainability initiative. Although environmental sustainability is a relatively recent movement in institutions of higher education both nationally and internationally, it has become one of the most important topics for leaders in higher education to address in the 21st century (Bardaglio & Putnam, 2009; Bartlett & Chase, 2004). There is a common misconception that the concept of "environmental sustainability" refers only to environmental concerns. In fact, this concept also takes economic concerns as well as social justice issues into account (Cortese, 2003; McKibben, 2007; Willard, 2009). The concept of environmental sustainability encompasses ideas, aspirations, and values that continue to inspire individuals and organizations to become better stewards of the environment while promoting smart economic growth and equitable social objectives. In its broadest sense, the strategy for environmental sustainability is to promote harmony among human beings as well as between humanity and nature (United Nations, 1987).

Problem Statement

Although there may be general support for the idea of environmental sustainability on many college and university campuses, it can be challenging for educational leaders to effectively implement environmental sustainability initiatives (Lozano, 2006). Accordingly, it can be challenging to build consensus and buy-in from the many stakeholders involved in an organization (Willard, 2009). This makes it difficult, on multiple levels, to effectively implement environmentally sustainable policies and

practices in institutions of higher education (Bartlett & Chase, 2004). Although there is much literature that articulates the context of environmental sustainability in higher education and describes associated green practices, there is a gap in research that addresses the process of how environmental sustainability initiatives are implemented in higher education settings (Wright, 2010).

Purpose of the Study

The purpose of this study was to understand how a university implemented a comprehensive environmental sustainability initiative. This understanding may assist other educational leaders in their efforts to green their own campuses. Implementing a comprehensive environmental sustainability initiative entails making a series of minor and major changes to an institution (McKenzie-Mohr, 2011). In many cases, existing campus policies and practices may need to be radically changed in order for environmental sustainability initiatives to be successfully implemented (Bardaglio & Putnam, 2009). The processes involved with implementing changes in higher education institutions that support environmental sustainability are not well understood (Wright, 2010). Thus, by conducting a case study of a single university, this study seeks to develop a deeper understanding of the institutional change processes involved with implementing a comprehensive environmental sustainability initiative on a university campus.

Research Questions

The central research question driving this proposed study was the following: How does a university implement a comprehensive environmental sustainability initiative? This central research question was informed by the following three guiding questions:

1. What strategies did the campus pursue in order to implement a comprehensive environmental sustainability initiative?

2. What facilitated the adoption of a comprehensive environmental sustainability initiative?

3. What obstacles or challenges were faced throughout the process of implementing a comprehensive environmental sustainability initiative?

The exploration involved with answering this central research question and these guiding questions provides an analysis that adds to the growing body of literature that strives to understand the role of environmental sustainability in higher education settings.

Conceptual Framework

In order to understand how a university is able to implement the changes required to become more environmentally sustainable, a conceptual framework is needed that will provide multiple lenses through which to view this transformative process. A myopic view of an organization is inadequate for this purpose. There is a need to view the processes of organizations through multiple lenses to reach a more comprehensive understanding of how an organization successfully implements change. The conceptual framework utilized draws from the literature on environmental sustainability as well as the literature on change in higher education, bringing both of these perspectives together into one, cohesive conceptual framework.

Overview of Conceptual Framework

For the purposes of this study, a new hybrid conceptual framework was developed to account for the multiple perspectives needed to adequately address issues of organizational change supporting environmental sustainability in higher education

(Figure 2). A conceptual model of sustainability is useful to frame an understanding of how an institution of higher education is situated within the wider context of the economy, society, and the environment. A nested model of sustainability will be utilized, demonstrating that the economy is dependent on society, and that both the economy and society are embedded within the environment (Giddings, Hopwood, & O'Brien, 2002; Willard, 2009). Furthermore, this nested model of sustainability will be coupled with Bolman and Deal's (2008) four frames model of organizational change. Bringing these two conceptual models together creates a new conceptual framework through which to use each of the four frames that Bolman and Deal articulated (structural, human resource, political, and symbolic) to examine the implementation of environmental sustainability initiatives in an organizational context. This coupling produces a hybrid model that is unique to this study. An expanded discussion of the components of this conceptual framework follows.

Nested Model of Sustainability

A variety of models have been developed to illustrate the concept of environmental sustainability, most often containing the three main dimensions of the economy, society, and the environment. Some of these models are in the form of a Venn diagram, while others display the three dimensions as being related but having no overlap (Costa, Martins, & Mata, 2006; Hart, 2006). For the purposes of this study, a nested model of sustainability will be utilized (Giddings et al., 2002; Hart, 2006; Willard, 2009). This model envisions the economy as being embedded in society, which in turn is embedded in the environment. Figure 1 provides a depiction of the nested model of sustainability as consisting of three concentric circles, demonstrating the relationship among the three

dimensions of the environment, society, and the economy (Giddings et al., 2002; Willard, 2009).

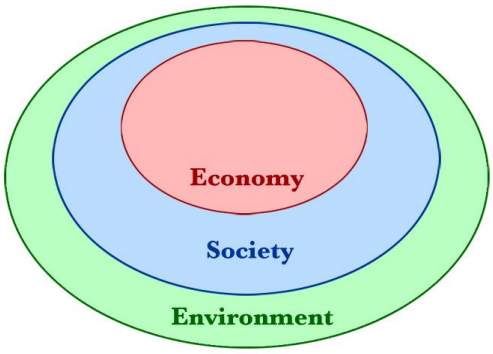

FIGURE 1. Diagram depicting nested model of sustainability as three concentric circles (Giddings et al., 2002; Hart, 2006; Willard, 2009).

For the purposes of this study, each of these three dimensions (economy, society, and environment) is critical to consider individually as well as collectively. It is important to understand how individuals and groups of people that comprise our society make decisions that affect the economic, social, and environmental well-being of the world we all share today, as well as the world we will leave behind for future generations.

Reframing of Organizations

Bolman and Deal (2008) developed a four-frame model for analyzing the multiple features of an intrinsically dynamic and complex organization. Each of the four frames (structural, human resource, political, and symbolic) provide a unique lens through which an organization can be viewed. These four frames have been integrated into the larger conceptual framework for this study. Utilizing the four-frame system devised by Bolman

and Deal can assist educational leaders in widening and refining the view of a college or university in the attempt to transition to a sustainable campus.

Structural frame. The structural frame is focused on how the structure of an organization affects the efficiency, decision-making processes, and overall flow of power within an organization. This frame looks at the social architecture of an organization in the attempt to understand how goals are set, tasks are delegated, and work is completed by the multiplicity of people who make up the organization. Bolman and Deal (2008) discuss organizational structure in terms of both vertical and lateral coordination. Vertical coordination is focused on how work is developed and controlled through goals, planning, policies, and practices from the highest levels of management all the way down to the lowest subordinate staff. Lateral coordination provides an analysis that takes into account the various structures that work is accomplished within such as meetings, task forces, matrices, and networks. By expanding one's knowledge of the structures at play in an organization, one is better able to understand which structural factors of an organization are effective and which are not. Understanding structural flaws and strengths of an organization assists leaders in their efforts to improve organizational efficiencies.

Human resource frame. The human resource frame focuses on the people within an organization, examining how people work together within the structure of an organization. The human resource frame strives to understand the needs of human beings within an organization, and how an organization can best utilize its workforce to maximize effectiveness. A major emphasis of any human resource frame analysis is job satisfaction. If employees find meaning in their work and are satisfied in their positions,

then it is much more likely that the organization will function effectively. Likewise, another important component of the human resource frame analysis involves the development of a human resource philosophy that can be communicated effectively to employees. By feeling a sense of connectedness to a higher ideal or philosophy, Bolman and Deal (2008) argued that employees take work more personally and seriously, providing them with the guidance and direction they need to make sense out of the work they contribute to. By better understanding the dynamics at play among the people who work within an organization, leaders are better positioned to create the conditions within which individuals can thrive in their various organizational roles.

Political frame. The political frame focuses on how decisions are made, how scarce resources are allocated, and what power structures are at play within an organization. An emphasis of the political frame is conflict as it plays out between individuals, and more importantly, between coalitions of individuals within organizations. Expanding on the human resource frame, the political frame looks at groups of individuals within an organization and how those groups compete for power and resources. By utilizing the political frame, a leader is better able to understand and resolve the political conflicts within an organization, as well as to advance a particular agenda.

Symbolic frame. The symbolic frame seeks to understand the unique cultures within an organization in the attempt to uncover some of the deeply held beliefs, visions, and practices of individuals within the organization. By better understanding organizational symbolism, leaders will be in a stronger position to effectively capture the deeper human experience associated with a particular organization. An analysis through the symbolic frame provides insight into the metaphors that individuals identify with as well as rituals

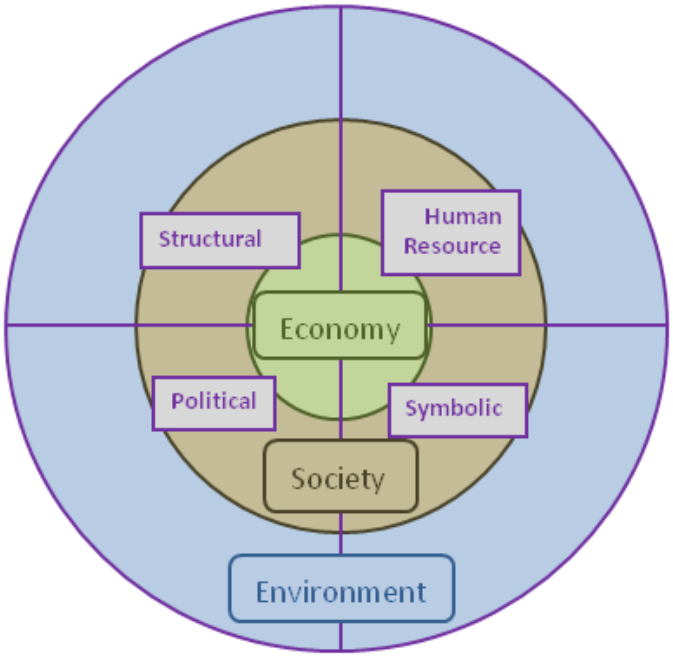

FIGURE 2. Conceptual framework depicting Bolman and Deal's (2008) Four Frames model as a lens through which to view organizational change in the context of a nested model of sustainability (Giddings et al., 2002; Hart, 2006; Willard, 2009).

that individuals participate in. The symbolic frame also focuses on how stories are told about the organization, both internally and externally. This analysis helps leaders to better understand the living culture of an organization.

A Hybrid Conceptual Framework

Figure 2 is a depiction of the hybrid conceptual framework being utilized to frame this study. Utilizing the four-frame system devised by Bolman and Deal (2008) can assist educational leaders in reframing the view of a college or university in the attempt to transition to a green campus. The nested model of sustainability demonstrates that the economy is dependent on society, and that both the economy and society are dependent on the environment. By coupling the four-frame model of organizations with the nested model of sustainability, a new hybrid conceptual framework is created which can assist educational leaders in the process of answering the research question of this study: How does a university implement a comprehensive environmental sustainability initiative?

Operational Definitions

Sustainability: The term "sustainability" has been defined and used in multiple ways. For the purposes of this study, the most widely quoted definition internationally will be used, which is the "Brundtland definition" from the United Nations 1987 *Report of the World Commission on Environment and Development: Our Common Future*: This definition states that sustainability means meeting the needs of the present without compromising the ability of future generations to meet their own needs (United Nations, 1987).

Environmental Sustainability: This study will focus primarily on what has become known as "environmental sustainability," which addresses environmental issues by also taking social and economic interests into account (Simpson, 2008).

Campus Sustainability: The term "campus sustainability" will be used in reference to environmental sustainability in a college or university setting (Bartlett & Chase, 2004).

Green: The terms "green," "greener," and "greening" will be utilized to indicate a reference to environmental sustainability initiatives. The term "green" can be used as a noun, an adjective, and/or a verb in this capacity (Creighton, 1998; Edwards, 2010).

Green Campus: This study will use the term "green campus" to generally refer to a college or university that has implemented a comprehensive environmental sustainability initiative. Likewise, the term "campus greening" will be utilized to indicate this implementation process. Using these terms helps to describe these concepts using less words (Edwards, 2010; Simpson, 2008).

Educational Leader: The terms "educational leader" and "higher education leader" will be utilized interchangeably to refer generally to individual members of colleges and universities who assume leadership roles within the institution. These leadership roles are assumed by administrators, faculty, staff, students and other individuals within the campus community. For the purposes of this study, the analysis of educational leadership will be focused on leading the implementation of a comprehensive environmental sustainability initiative (Fink & Hargreaves, 2006; Fullan, 2005; Fullan & Scott, 2009).

Comprehensive: The term "comprehensive" will be used in this study to refer to campus-wide environmental sustainability initiatives that focus on greening the whole

campus including the physical campus, the educational curriculum, and the culture of the campus (Bardaglio & Putnam, 2009; Cortese, 2003; Creighton, 1998; Simpson, 2008).

Assumptions and Delimitations of the Study

This case study will work toward building a clearer understanding of how a university implements a comprehensive environmental sustainability initiative. One of the central assumptions of this study is that environmental sustainability is a valuable goal to pursue. Although the term can seem vague, this study will strive to articulate the various meanings of environmental sustainability in a higher education context. Moreover, this study assumes that environmental sustainability is a tangible and achievable goal in all three of the major dimensions to be discussed: environmental, social, and economic. This study is not designed to question the value of environmental sustainability itself, but rather to investigate how it is implemented in a higher education setting. Due to the nature of case study research, the findings of this study will have limited applicability to other research settings. However, this study is designed to assist educational leaders in better understanding the processes involved with implementing environmental sustainability initiatives in colleges and universities.

Another fundamental assumption of this study is that there are many similarities between colleges and universities in terms of both structure and function. Therefore, some of the findings may be transferable to other colleges and universities. Although it is expected that the results of this study will not be completely transferable to other college or university settings, it is assumed that the findings of this study will be of interest to educational leaders in higher education settings who are working to implement green campus initiatives. In particular, the findings of this study may be most transferable to

smaller, faith-based universities in the United States. It is expected that the results of this study will add to the growing body of literature that studies the processes involved with implementing comprehensive environmental sustainability initiatives in higher education.

The primary focus of this study is an examination of the process of environmental sustainability initiative implementation on a university campus. Although the following literature review discusses the context of environmental sustainability, as well as specific green practices being implemented on college and university campuses, these areas are not of primary concern to this study. For the purposes of this study, the literature reviewed and data collected will be analyzed with an emphasis on the process of implementing change in higher education settings. Environmental sustainability initiatives will be understood as practices that are implemented on college and university campuses. This case study seeks to understand how a particular university has implemented a comprehensive environmental sustainability initiative. This analysis primarily consists of understanding processes operating within the human dimensions of the organization, with a focus on green campus initiatives as institutional changes.

Significance of the Study

Although many studies have focused on single aspects of environmental sustainability in higher education, not many have widened the scope to account for a comprehensive understanding of the practices involved in a campus-wide sustainability effort or the processes involved in achieving this goal. In order to approach environmental sustainability in higher education settings in a comprehensive fashion, nearly every major aspect of campus curriculum, design, planning, maintenance, and operations needs to be addressed, as played out through the activities of administrators,

faculty, staff and students (Abubakar & Alshuwaikhat, 2008; Bardaglio & Putnam, 2009; Creighton, 1998). Environmental criteria such as energy, emissions, waste, water, and transportation must be considered alongside human dimensions such as learning, behavior, attitude, and activism (McKenzie-Mohr, 2011). Social issues and economic considerations are also integral to environmental sustainability initiatives (McKibben, 2007). There are also many local, state, and federal laws, regulations, and policies that address environmental sustainability which must be adhered to (Richardson & Wood, 2006). There are so many factors to consider when planning environmental sustainability initiatives that it becomes a complicated process to develop, adopt, and implement environmental sustainability initiatives.

A variety of studies have described the context of environmental sustainability in higher education as well as the associated practices that campuses implement. However, few studies have focused on the *process* of change in higher education that allows for the transition to green. Although we may know what environmental sustainability looks like on college and university campuses, it is not clear that higher education leaders know how to get there. The need for institutions of higher education to transition to green has been well demonstrated, both from a moral perspective as well as from a pragmatic standpoint (Bardaglio & Putnam, 2009; Bartlett & Chase, 2004; Orr, 2004; Simpson, 2008). Thus, it is critical that higher education leaders learn to effectively implement comprehensive environmental sustainability initiatives. This study sought to build a deeper understanding of how a university implemented a comprehensive environmental sustainability initiative.

Conclusion

There is a growing movement on college and university campuses, both nationally and internationally, toward environmental sustainability (Bartlett & Chase, 2004; Sharp, 2002; Wright, 2010). This movement has grown in response to major declines in ecosystem health around the world, including the threats of global climate change (Creighton & Rappaport, 2007). The environmental sustainability movement is also a reaction to distress in the economies of many countries due to the effects of globalization, as well as issues of social injustice and inequity in both the developed and developing world (Orr, 2004; Shiva, 2005). Scholars and practitioners of environmental sustainability in higher education have argued that there is a moral imperative for educational leaders to develop environmentally sustainable campuses so that they can serve as models for the global community to learn about ways in which current societies can be transformed into sustainable societies (Bardaglio & Putnam, 2009; Cortese, 2003; Orr, 2004).

The field of environmental sustainability in higher education has been growing rapidly over the past few decades, and it continues to expand (Edwards, 2010). Although progress has been made in developing and implementing policies and practices that promote environmental sustainability in institutions of higher education, there is still much more progress to be made (Creighton & Rappaport, 2007). As college and university campuses adopt environmental sustainability as one of the principles that drive decision making, this progress will continue, most likely in an incremental manner. Some research has indicated that environmental sustainability could serve as a core

concept or paradigm, serving as the basis for framing all campus decision making (Abubakar & Alshuwaikhat, 2008).

In an effort to address these concerns, this study investigated how a comprehensive environmental sustainability initiative was implemented at a particular university. By building an understanding of how one university has implemented a comprehensive environmental sustainability initiative in the form of a case study, my hope is that the findings of this study may be transferable to other institutions of higher education that are interested in this topic. The campus sustainability movement assists educational leaders in developing the knowledge and skills needed to plan with current and future generations in mind.

As educational leaders implement policies and practices that promote environmental sustainability, all campus stakeholders can benefit, as well as the world at large. It has been argued that there is a great need, in addition to having environmentally sustainable policies and practices in place, to ensure that the individuals involved at all levels of the campus community are actively engaged in the implementation of environmental sustainability programs (Chesnes, Lindner, & Newport, 2003; McKenzie-Mohr, 2011). The issues involved with environmental sustainability affect everyone on this planet. Everybody is affected by these issues, and everyone has a role to play in improving the world we live in for our generation, as well as generations to come (Abubakar & Alshuwaikhat, 2008; Edwards, 2010; Orr, 2004). Higher education leaders are well-positioned to oversee the processes of developing, implementing, and enhancing environmental sustainability initiatives (Bardaglio & Putnam, 2009; Bartlett & Chase, 2004). This key role has been described as not only an issue of practical significance, but

also a moral imperative to make the world a safer and healthier place to live (Cortese, 2003; Orr, 2004). It is difficult to imagine a more appropriate role for education to play in society.

CHAPTER 2

LITERATURE REVIEW

Introduction

This literature review explores the body of research that articulates the need for, and implementation of, comprehensive environmental sustainability initiatives on college and university campuses, including literature that addresses change in higher education. Environmental sustainability is a relatively new field, emerging primarily in the early 1970s and gaining momentum in the 1980s and 1990s. The most significant growth in the environmental sustainability movement on college and university campuses, also referred to as the "campus sustainability" movement, began in the late 1990s and has continued until the present day (Cortese, 2003; Edwards, 2010; Orr, 2004; Simpson, 2008).

As a new field, campus sustainability does not have a long tradition of robust empirical research. Most of the literature consists of conceptual articles and books that describe the implementation of environmental sustainability efforts in higher education settings. Higher education leaders are at the beginning stages planning and implementing environmental sustainability initiatives (Corcoran & Wals, 2004; Wright, 2010). There are no longitudinal studies or large data sets to draw from (Calder & Clugston, 2003;

Walton, 2008). Of the empirical studies that have been conducted, the subject matter is diverse, specialized, and fragmented, making it difficult to find multiple studies in specific areas of inquiry (Wright, 2010). Thus, this literature review will focus on a variety of distinct sub-areas of research under the larger umbrella of environmental sustainability in higher education in an attempt to weave them together in a way that will provide insight into how environmental sustainability initiatives are implemented in higher education settings.

This review of literature will begin with an exploration of the theoretical context of environmental sustainability in higher education, examining the philosophical significance and moral imperative driving the campus sustainability movement. Then, a detailed description of green campus practices will be provided with examples that demonstrate outcomes. Finally, an analysis of the process of implementing campus sustainability initiatives will be advanced, with an emphasis on the nuances of change within higher education settings.

Context of Environmental Sustainability in Higher Education

The literature reviewed revealed a plethora of rich, descriptive pieces including books, journal articles, websites, and a variety of other conceptual writings that discuss the significance of environmental sustainability on college and university campuses. Prolific writers have emerged over the last several years who come from a variety of academic and professional backgrounds. For the purposes of this study, the context of environmental sustainability in higher education is framed in terms of a conceptual model known as the nested model of sustainability which demonstrates the relationships between the three dimensions of sustainability: economic, social, and environmental.

Figure 3 depicts the nested model of sustainability, demonstrating that the economy is dependent on society, and that both the economy and society are embedded within the environment (Giddings et al., 2002; Hart, 2006; Willard, 2009).

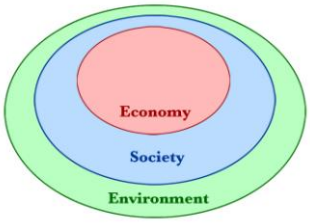

FIGURE 3. Diagram depicting nested model of sustainability as three concentric circles.

Although economic, social, and environmental concerns are arguably inextricable, it is useful to consider the individual significance of each of these dimensions as they relate to the context of campus sustainability to clarify the significance of each dimension as parts of a larger whole. Undergirding all three of these dimensions is the presence of a moral imperative to implement environmental sustainability initiatives that has been articulated by a number of scholars across multiple disciplines.

Moral Imperative

Many scholars, researchers, and higher education leaders have expressed the significance of implementing environmental sustainability initiatives based on a moral imperative (Bardaglio & Putnam, 2009; Bartlett & Chase, 2004; Blewitt & Cullingford, 2009; Creighton & Rappaport, 2007; M'Gonigle & Starke, 2006; Orr, 2004). College and university campuses are the primary places where future leaders are provided with the information, tools, and skills needed to secure long-term well-being for everyone in

the world (Blackburn, 2007). This moral focus in the literature has been discussed from a secular position, from a spiritual position, or from a combination of both positions.

For example, Orr (2004) has articulated conceptions of environmental sustainability that are grounded in natural science but also address moral, political, and spiritual concerns. In particular, Orr (2004) has placed the responsibility of educating the general public about the significance of environmental sustainability on institutions of higher education. Orr (2004) states that colleges and universities ought to serve as models of environmental sustainability, demonstrating how individuals and institutions can change to become more environmentally sustainable. As much as Orr's (2004) position is rooted in science, he believes that a true shift to an environmentally sustainable lifestyle can only come from a realization grounded in spirituality, or at least from a particular way of thinking about the world, often referred to as a worldview. Orr (2004) is not alone in his position that individuals and institutions need to change the ways in which they think before environmental sustainability can be realized.

More recently, Bardaglio and Putnam (2009) have argued that environmental sustainability ought to be adopted as a central strategy in higher education. The authors argue that environmental sustainability should not be an afterthought, but rather should be recognized as the core organizing principle that drives campus decision making. This argument is rooted in a deep moral perspective, describing environmental sustainability as being as much of an ethical and cultural project as it is a scientific and engineering endeavor (Bardaglio & Putnam, 2009).

Environmental Sustainability

Of the three dimensions of sustainability, this study will focus primarily on the environmental dimension. The term "environmental sustainability" grew largely from work in the field of ecology, a sub-discipline within the larger field of biology. Ecology has been defined as the scientific study of the distribution of various populations of organisms and the interactions that determine their distribution and abundance (Begon, Townsend, & Harper, 2006). Traditionally, the field of ecology, although it is innately interdisciplinary, was focused on forming a scientific understanding of the various ecosystem interactions of the Earth. However, as the field of ecology evolved, it began to influence disciplines outside of the natural sciences, eventually becoming a major driver for the environmental sustainability movement. A notable turning point in the history of the field of ecology toward environmental sustainability was a call-to-arms document published by the Ecological Society of America in 1991 entitled "The Sustainable Biosphere Initiative: An Ecological Research Agenda: A Report from the Ecological Society of America" (Lubchenco et al., 1991). This seminal document urged all ecologists to view the field of ecology as a science that ought to function within the wider context of environmental sustainability. The document, authored by Lubchenco et al. (1991), states that

> Many of the environmental problems that challenge human society are fundamentally ecological in nature. The growing human population and its increasing use and misuse of resources are exerting tremendous pressures on Earth's life support capacity. Humankind must now develop the knowledge required to conserve and wisely manage Earth's resources. Citizens, policymakers, resource managers, and leaders of business and industry all need to make decisions concerning the Earth's resources, but such decisions cannot be made effectively without a fundamental understanding of the ways in which the natural systems of Earth are affected by human activities. (p. 373)

Proclamations like this served as a turning point in the field of ecology, providing an ethical dimension to the work that ecologists conducted, as well as a conceptual framework that could be utilized to carve out a path for future work in this field. As the field of ecology developed and evolved in this trajectory, ecologists widened the scope of what the various meanings of their work could be, and consequently the field of ecology became even more interdisciplinary than it previously had been. Eventually, ideas from ecology were infused into a multitude of other fields including philosophy, psychology, sociology, economics, political science, art, literature, and many more. This interdisciplinary symbiosis between ecology and other subjects grew into a larger framework of study known as environmental sustainability. All human activity is ultimately dependent on services that ecosystems provide (Orr, 2004; Shiva, 2005). Thus, the environmental dimension of sustainability arguably ought to be addressed with deep concern. However, it is important to form an understanding of environmental sustainability as only one of the three major dimensions within the larger context of sustainability as a whole.

Social Sustainability

In addition to the focus on environmental sustainability, there is also a tradition within the social sciences that focuses on the need for social sustainability. As a society, there is an increasing desire to protect and preserve resources for future generations (Seymour & Walker, 2008). This view demands that there must be a focus on how society is structured and how humans interact. From this perspective, human societies need to work together and form common sets of worldviews, values, cultural norms, and

behaviors that will be conducive to sustainability. Goodland (1995) made this point clear, stating that social sustainability can only be achieved by the systematic community participation of a strong civil society. He argues that social and moral capital are of considerable importance if sustainability is to be reached within the social dimension. Goodland discusses the importance of building community, developing cultural identity, embracing diversity, promoting tolerance, practicing compassion, and participating in a number of other personally and socially-preserving activities. The social dynamics that Goodland discusses must be recognized and adequately addressed if sustainability will be able to be reached. Those who work in the social sciences have the unique opportunity to advance notions of social sustainability in research, professional discourse, and education that seeks to understand and promote sustainable societies.

Human health and social equity. The implementation of environmental sustainability initiatives can benefit human health and improve social equity (Brown, 2005; Cortese, 2003; Edwards, 2010; Orr, 2004). For example, a number of campus sustainability issues involve improving human health through actions such as serving healthier foods on campus, providing clean and filtered drinking water for human consumption, designing walkable and bikeable campuses to increase personal fitness, reducing the number of cars and other air pollution sources to improve air quality for breathing, and the planting of trees to provide shade from the sun's harmful UV rays as well as to provide cleaner air (M'Gonigle & Starke, 2006).

Campus sustainability initiatives can also support social equity concerns. When initiatives such as those mentioned above are implemented, all campus stakeholders equally benefit. For example, by having cleaner air to breathe, healthier food to eat, and

access to affordable transportation systems, all campus constituents have an equal opportunity for a healthier educational experience. By providing equal access to these valuable resources, a campus is demonstrating a commitment to promoting inclusivity among campus constituents, regardless of socio-economic status, race, religion, sex, gender identity, or other individual differences. By creating a stronger sense of inclusivity, these initiatives can assist in bringing students and other campus stakeholders together as they work toward the common goals of learning how to envision and create a world that is sustainable and just for everyone (Bardaglio & Putnam, 2009).

The Earth Charter. Perhaps one of the most eloquent descriptions of the social cohesion needed in order to achieve sustainability can be found in the Preamble to the Earth Charter (2000), a document created by the independent Earth Charter Commission, which was convened as a follow-up to the 1992 Earth Summit in order to produce a global consensus statement of values and principles for an environmentally sustainable future. The document was developed over nearly a decade through an extensive process of international consultation, to which over 5,000 people contributed. The Preamble of the Earth Charter (2000) states that,

> We stand at a critical moment in Earth's history, a time when humanity must choose its future. As the world becomes increasingly interdependent and fragile, the future at once holds great peril and great promise. To move forward we must recognize that in the midst of a magnificent diversity of cultures and life forms we are one human family and one Earth community with a common destiny. We must join together to bring forth a sustainable global society founded on respect for nature, universal human rights, economic justice, and a culture of peace. Towards this end, it is imperative that we, the peoples of Earth, declare our responsibility to one another, to the greater community of life, and to future generations. (p. 1)

The Earth Charter persists as one of the major guiding documents internationally that provides a framework for understanding the concept of a sustainable society. Clearly,

there is much more work to be done, and the field of education bears much of the responsibility for this movement in that people need to be educated about the relevance of sustainability as a concept that informs and drives human decision making. Society and the environment are two of the three critical dimensions of sustainability. However, this discussion is not complete without also addressing economic sustainability.

Economic Sustainability

In addition to the environmental and social dimensions of sustainability, the dimension of economics is critical. Without an economic system that allows for societies and ecosystems to thrive, environmental sustainability is not possible. As mentioned previously, there is much overlap in the three main dimensions of sustainability such that environmental benefits often also lead to social benefits which can also be associated with economic vitality and financial stability (McKibben, 2007). Economists such as Daly have utilized the terms "sustainable development" and "smart growth" to indicate the need for a perspective of economics that adequately takes social and environmental concerns into account (Daly, 1996). Daly (1996) argued that sustainable development necessarily entails a radical shift from a growth economy to what he describes as a "steady-state economy." He describes a steady-state economy as a system in which natural resources are consumed at a fixed, sustainable rate and the quality of the environment is maintained at a level that protects the health of humans, other species, and ecosystems (Daly, 1996). This conception of economics provides a framework for developing sustainable economic policies and practices. For the purposes of this literature review, I will focus on two significant concepts of economic sustainability: (1)

the triple bottom line, and (2) the dichotomy between strong and weak views of sustainability.

Triple bottom line. In conventional economics, it is common knowledge that, traditionally, economists argue that what matters most is "the bottom line," which is defined as the last line of a financial statement that shows the net profit or loss of an individual, a company, or an organization. However, the concept of the bottom line refers strictly to the narrow dimension of monetary value. This concept takes for granted the notion that the value of everything in the world can be expressed strictly in terms of financial capital. As a reaction against the concept of the bottom line, ecological economists developed the term, the "Triple Bottom Line." This term was coined by economist John Elkington in 1994, and later articulated in his book entitled *Cannibals with Forks: The Triple Bottom Line of 21st Century Business* (Elkington, 1998). The concept of the triple bottom line has been summarized as incorporating the three dimensions of significance to sustainable development: People, Planet, and Profit.

Hawken, Lovins, and Lovins (1999), in their book *Natural Capitalism*, refined the notion of the triple bottom line by arguing that there are four types of capital that ought to be considered in a sustainable economic system: (1) Human capital, in the form of labor and intelligence, culture, and organization; (2) Financial capital, consisting of cash, investments, and monetary instruments; (3) Manufactured capital, including infrastructure, machines, tools and factories; and (4) Natural capital, consisting of resources, living systems, and ecosystem services. The triple bottom line is arguably a much more comprehensive and sound way to understand the multiple dimensions involved with any economic analysis. This concept has recently taken hold in the

business community, and has emerged to be a major driver in corporate governance, being adopted by large corporations, government agencies, as well as institutions of higher education (Bardaglio & Putnam, 2009).

Braungart and McDonough (2002) took the triple bottom line concept a step further, introducing the concept of "the triple top line" in order to explain that even the triple bottom line approach may not be adequate for reaching environmental sustainability. Braungart and McDonough argue that in triple bottom line accounting, the social and environmental dimensions of sustainability often continue to be an afterthought of the main focus of business, which is the economic dimension. Instead, Braungart and McDonough argue that the issues of social equity and environmental health ought to be considered up front as a design tool. By utilizing the "triple top line" approach to sustainability, designers and business developers are able to create value in the concerns of ecology and equity by implementing ideas that can turn out to be financially lucrative in ways that would not have been imagined with a conventional economic worldview (Braungart & McDonough, 2002).

Strong versus weak sustainability. The review of literature revealed articles and books in which scholars argue about the significance of environmental sustainability as a paradigm. More specifically, there is an ongoing debate in the literature, primarily originating from research in economics, about how intense our commitment to environmental sustainability ought to be. Kearins and Springett (2003) describe the difference between "weak" and "strong" sustainability paradigms, arguing emphatically that a strong sustainability paradigm is what is needed. Weak sustainability programs are described as being dictated primarily by economic interests, whereas strong sustainability

programs are characterized as being dictated by conserving and preserving natural resources for their own benefit. The authors provide a detailed argument for the need to opt for a strong sustainability paradigm rather than a weak one in order to actually reach a state of sustainability. This entails placing the intrinsic value of both humans and the environment in front of economic and/or political interests, and making decisions regarding sustainability for the sake of sustainability itself.

Neumayer (2003) presents a balanced description and analysis of the limits of both the weak and strong sustainability paradigms, demonstrating the merits and challenges inherent in each paradigm. Taking a more objective approach, Neumayer demonstrates that both paradigms have challenges. McKibben (2007) makes a similar argument about the need to approach economics from a perspective that does not solely focus on economic growth as the main driver. His perspective, framed as "Deep Economy," articulates the position of a strong sustainability paradigm, arguing that growing our economy in an unsustainable manner actually leads to low levels of happiness and satisfaction, ultimately leading to discord in society (McKibben, 2007).

This study strives to understand how campus sustainability initiatives are implemented. The opposing paradigms of strong and weak sustainability will be further explored throughout this study as a way to provide an understanding of the context within which campus sustainability initiatives are implemented in higher education settings. In particular, these paradigms will help to frame the analysis below of the practice and process of implementing campus sustainability initiatives.

Green Campus Practices

The literature reviewed indicates that institutions of higher education have implemented green campus practices both nationally and internationally. These practices are primarily documented in conceptual and descriptive literature, with some empirical research conducted on the subject as well. For the purposes of this study, green campus practices are delineated into four distinct areas, based on a conceptual model developed by Cortese (2003) that organizes these practices into the following categories: (1) Campus Operations, (2) Education, (3) Research, and (4) External Community.

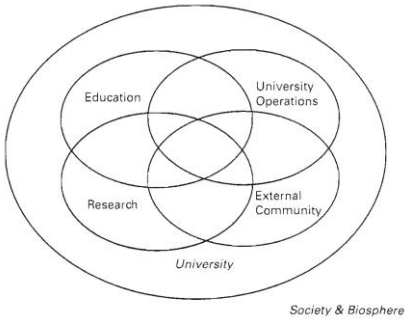

FIGURE 4. Model of four areas of campus sustainability practice (Cortese, 2003).

As the above model clearly depicts, although each of these four dimensions is distinct, there are also many areas of overlap and points of intersection. The discussion of green campus practices below will be framed by this conceptual model to assist in the analysis of an otherwise disorganized set of disparate but related activities.

Sustainable Campus Operations

The first area of practice is focused on sustainable campus operations. Of the four areas of practice to be described with respect to campus sustainability, the operations area appears to be written about the most. College and university campuses are akin to small

cities, containing transportations systems, energy and water infrastructure, landscaping, and other facilities that consume large amounts of natural resources and emit large amounts of greenhouse gases (Blackburn, 2007). Much like municipalities, institutions of higher education must address the same environmental issues of the 21st century including scarcity, pollution, and global climate change. By implementing green campus initiatives that address these issues, educational leaders have the potential to save financial resources over time as well as improve human and environmental health.

There are numerous examples of college and university campuses that have implemented green campus initiatives focused on campus operations. Examples of areas that have been addressed include water conservation, energy management, solid waste management, dining services, grounds management, transportation, and purchasing (Creighton, 1998). By implementing these initiatives, campuses are able to save money, conserve scarce resources, and demonstrate sustainable solutions that the rest of society can use as models for transformation (Edwards, 2010; M'Gonigle & Starke, 2006). Maintaining a green campus involves the on-going improvement of campus facilities to use less energy, water, and other resources while simultaneously providing a healthy, aesthetically beautiful campus (Creighton, 1998). By demonstrating sustainable solutions for operations, college and university campuses are in a unique position to lead the rest of the world toward a sustainable society (American College and University Presidents Climate Commitment [ACUPCC]; 2009).

Water conservation. College and university campuses are implementing a number of water conservation initiatives throughout campus facilities, such as installing low-flow water fixtures, waterless urinals, and automatic sensors on sinks (Creighton & Rappaport,

2007). Moreover, additional water conservation initiatives have been implemented such as landscaping with drought-tolerant native plants, utilizing reclaimed water from sewage treatment plants, and capturing greywater from showers, sinks, and lavatories for use in water closets (Bardaglio & Putnam, 2009).

Storm water projects are also a major focus. Campus storm water conservation projects include installing porous pavement to allow storm water to infiltrate into the soil and groundwater, planting and caring for appropriate trees and other plants to retain water on-site, utilizing mulch to retain rain water and prevent runoff, and capturing rain water for reuse on-site (Creighton, 1998). Lastly, a focus on drinking water conservation projects has grown over the last two decades. There is a growing concern about the impact of bottled water on society and the environment, and institutions of higher education are addressing these issues (Gleick, 2010). By implementing initiatives such as installing tap water filtration stations, promoting the use of reusable water bottles, and reducing bottled water sales, campuses are demonstrating that healthy, affordable drinking water can be provided to a campus community as an alternative to bottled water.

Energy management. Perhaps the most significant environmental impact created by colleges and universities are the air pollutants and greenhouse gas (GHG) emissions generated as the result of burning fossil fuels for campus energy needs (Creighton, 1998). Whether fossil fuels are burned on-site for energy, or fossil fuel-based energy is purchased from an off-site utility provider, the demand for energy by college and university campuses is expensive and environmentally damaging (Philips, Putnam, & Simpson, 2008). As a response to increasing energy demands, campuses are

implementing initiatives to increase energy conservation measures, energy-efficiency technologies, and renewable energy generation (Creighton & Rappaport, 2007).

Energy conservation can be increased by implementing policies and practices that reduce energy demands before they are created. Energy-efficient technologies such as lighting, heating and cooling systems, and ENERGY STAR® rated appliances can be installed to use less energy than conventional technologies. Renewable energy generation can be increased on campuses by installing systems such as solar photovoltaic panels, wind turbines, or geothermal heating systems. Renewable energy can also be purchased from outside sources in the form of Renewable Energy Credits (RECs), also known as "green power" (U.S. Green Building Council's [USGBC]; 2009). By purchasing green power, a campus supports the renewable energy industry indirectly by helping to subsidize off-site renewable energy plants. Through these combined efforts, energy management on college and university campuses can considerably reduce energy consumption, save the campus a significant amount of money, and greatly reduce associated GHG emissions (Blackburn, 2007).

Solid waste management. The solid waste management operation at any college or university is one of the core green campus initiatives (Creighton, 1998). From the 1970s to the 1990s, campus recycling programs flourished as infrastructure and culture changes allowed for the recycling of materials such as paper, cardboard, glass, plastic, and metals (Keith & Tchobanoglous, 2002). By source separating waste into various categories (e.g., paper, glass, plastic, etc.), campuses are able to reduce the amount of materials sent to waste disposal facilities such as landfills or waste-to-energy facilities. Instead, recyclable materials are collected, processed, and either shipped to recycling centers or

sold as commodities. Recycling programs can save colleges and universities a significant amount of money by reducing hauling costs, reducing tip fees at waste disposal facilities, and generating income by selling recyclable commodities (Porter, 2002). Recycling education programs can help campus community members to more successfully participate in and support a collegiate campus recycling program (Lamoreaux et al., 2003).

Other newer solid waste management programs include recycling universal wastes such as batteries and fluorescent light bulbs, recycling ink and toner cartridges from printers and copiers, and recycling electronic wastes such as computers and cell phones. As time goes on, more markets are developed for recycling an ever-increasing number of materials, and institutions of higher education are at the forefront of this movement (Keith & Tchobanoglous, 2002).

Over the last decade, recycling programs have become the norm throughout most colleges and universities in the United States. As institutions of higher education have become more effective and sophisticated at operating recycling programs, newer waste streams have been targeted for diversion (Kaplan, 2009). Many colleges and universities have implemented composting programs to divert organic wastes from their campuses including landscaping debris and food waste (Creighton, 1998). If implemented appropriately, organic materials management programs can be cost-effective by reducing hauling fees, reducing tip fees at waste disposal facilities, and offsetting the costs of importing soil amendments by making quality compost on-site.

Another important component of a college or university solid waste management program is the reuse of materials on campus (Blackburn, 2007). Items such as furniture

and office supplies can be collected and re-distributed to end users who need those items instead of always buying new products. Some college and university campuses operate surplus property programs in which the larger, more valuable pieces of property are tracked and redistributed. Often times the more valuable campus assets may be sold, which can generate significant income for the campus. Campuses may also have on-site property redistribution centers, or reuse stores, where members of the campus community can come to drop-off unwanted items and take or buy needed items. Reuse programs significantly help campuses to reduce their waste, and can be economically beneficial by resulting in either cost savings, revenue generation, or both (Keith & Tchobanoglous, 2002).

Dining Services. One of the most significant features of any college or university campus is its dining facilities and services. The food and drinks that are served to members of a campus community for nourishment are evaluated by several criteria; such as, food quality, food variety, cost-effectiveness, and the quality of customer service (Creighton, 1998). Sustainable food options may include food that was grown or caught locally, food that was grown utilizing organic methods, and/or food that does not contain genetically modified organisms (GMOs).

In addition to providing healthy, affordable food, dining services departments also have opportunities to implement green initiatives in areas such as service ware, food reuse and donation, and food waste composting. Campus dining facilities can also promote sustainability by installing energy-efficient appliances, participating in water conservation practices, and utilizing green cleaning products (USGBC, 2009).

Landscaping and grounds management. For many colleges and universities, the campus grounds have one of the largest impacts on a visitor's perception of the campus as a whole. When campuses appear to be well cared for and are aesthetically beautiful, individuals are more likely to maintain a positive perception of the campus. Several sustainable grounds management techniques have been implemented on college and university campuses. These include reducing water consumption, planting drought-tolerant and/or native plants, composting organic wastes, applying integrated pest management (IPM) techniques, and incorporating organic soil management approaches (Creighton, 1998). As with buildings, a sustainable landscape design must balance environmental issues with the long-term functional and aesthetic expectations of the campus community (Bencks, 2009).

Alternative transportation. The transportation system is an important feature of any college or university. Campus community members need, at minimum, to travel to and from campus, as well as throughout the campus itself, as they engage in campus activities. Alternative transportation initiatives strive to provide safe, comfortable ways for people to travel to, from, and on campus with a minimal impact on human and environmental health (Krueger & Murray, 2008). Many campus transportation initiatives focus on relieving the traffic congestion caused by single car drivers as well as solving related parking accommodation issues (Havlick & Toor, 2004). Alternative transportation programs can consist of mass transit options, bicycling opportunities, and designated walking paths. Transportation programs can also implement green technologies such as electric vehicles, alternative fuel vehicles, and human powered vehicles to the campus fleet of service vehicles (Krueger & Murray, 2008). More

recently, some campuses have partnered with new companies such as Zipcar©, a car sharing company, and Zimride©, a ride-sharing company. Car sharing and ride sharing are becoming increasingly popular on college and university campuses, even in rural areas (Bardaglio & Putnam, 2009).

Purchasing. Colleges and universities purchase a massive amount of products and services on an on-going basis. Examples of green purchasing initiatives include selecting environmentally preferable and socially responsible products, purchasing in bulk, developing central purchasing programs, and negotiating contracts with environmentally beneficial services specified (Blackburn, 2007; Creighton, 1998). By purchasing green products and services, a campus can save money and have a positive impact on the world that reverberates throughout the supply chain.

Green buildings. The most notable synthesis of green campus facility initiatives has culminated in the green building movement (Holowka, 2008). In the United States, the U.S. Green Building Council's (USGBCs) Leadership for Energy and Environmental Design (LEED®) green building rating system has gained significant momentum over the last decade since its inception (Simpson, 2008). LEED® categories include sustainable sites, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality, and innovation in design (USGBC, 2009). By earning points in these categories, buildings earn a rating of either: Certified, Silver, Gold, or Platinum. Green buildings save campus resources and provide a healthier indoor experience.

Climate action planning. As issues of climate change have become more of a focus for society at large, college and universities have played a major role in addressing these

concerns (Bardaglio & Putnam, 2009; Walton, 2008). By conducting greenhouse gas (GHG) inventories, campuses are able to quantify GHG emissions associated with their operations. A GHG inventory is the accounting of all GHGs generated by an organization. The majority of GHG emissions associated with a college or university are the result of direct emissions from burning fossil fuels for heating buildings, heating water, and supplying power for the institution's vehicle fleet (Creighton & Rappaport, 2007). Also of significance are indirect GHG emissions from sources that are not owned by the campus itself, but rather are the result of activities associated with essential campus activities such as automobile commuting, air travel, and campus deliveries. All of these activities, and many more, directly and indirectly contribute to the greenhouse effect caused by excessive GHG emissions. By conducting annual GHG inventories, campuses are able to account for their GHG emissions and then take actions to reduce GHG emissions associated with all campus activities (Creighton & Rappaport, 2007).

Developing goals and plans for reducing campus GHG emissions is referred to as climate action planning (Bardaglio & Putnam, 2009). In recent years there has been a growing trend of top-down directives such as the American College and University Presidents' Climate Commitment (ACUPCC, 2009). The ACUPCC (2009) has been signed by over 675 college and university presidents in the United States, providing the top-down directive to implement a comprehensive climate action plan to reduce GHG emissions with the ultimate goal of climate neutrality. The ACUPCC (2009) also emphasizes the importance of infusing concepts of sustainability across the curriculum (a topic considered below) in order to provide students with educational resources regarding the significance of sustainability. Although the ACUPCC (2009) is a non-binding

agreement, it can be a powerful tool to assist campuses in gaining the momentum needed to develop and implement effective campus sustainability initiatives (Bardaglio & Putnam, 2009).

Educating Campus Stakeholders about Sustainability

The second area of practice that this literature review will address involves educating campus stakeholders about sustainability. Of the four areas of practice discussed, the literature in this area is second in magnitude only to the literature on operations practices. The central mission of all colleges and universities is education. However, education functions in a number of ways, and manifests for a variety of purposes. For the purpose of this study, education about environmental sustainability will be discussed in terms of educating campus stakeholders about green campus practices, as well as infusing sustainability across the curriculum. The former is typically geared to all campus stakeholders, including staff, faculty, and students (N. Davis et al., 2010). The latter is focused more on providing academic programs for students (Bartlett & Chase, 2004).

Education for sustainable campus operations. Campuses aspiring to be green must provide on-going education to the campus community to maintain a high level of participation in green campus initiatives. The literature on this topic is largely focused on the need for education and social marketing techniques that provide campus stakeholders with information, motivation, and an ethical framework for changing particular behaviors. The context of these studies is often focused on recycling programs or other green initiatives. Much of the emphasis is on the role that students play in implementing green initiatives related to campus operations (Eagan, Erickson, & Keniry, 2009). However, it has been argued that all campus stakeholders have a key role to play in order

for these efforts to be effective (N. Davis et al., 2010). Of the literature reviewed, two studies were identified that focused on education for green campus operations.

Halfacre-Hitchcock and Owens (2006) conducted a study regarding the experiences of a student team in implementing a campus-level environmental sustainability initiative. This initiative consisted of retrofitting an existing campus building, converting it into a green building, and informing the public about this retrofit. Within the newly renovated green building, this study was designed to gain insight into the perceptions of the building occupants as well as to measure the effectiveness of a new recycling program in the building. Utilizing a mixed-method approach, interviews were conducted, surveys were administered, and a waste audit was performed in order to assess the impact of the initiative (Halfacre-Hitchcock & Owens, 2006). The study assessed student and faculty attitudes, information levels, and behaviors before and after project implementation. The results demonstrated no significant increase in green behaviors that could be linked to this project. However, the researchers attributed these results to the inherent complexities in human behaviors, as well as the limited scope of this study (Halfacre-Hitchcock & Owens, 2006).

A similar study was conducted by Lamoreaux et al. (2003) at Francis Marion University. A student-led experimental project was conducted to determine the relationship, if any, between recycling rates and associated education in student housing settings. The study was conducted in student apartments, where some students were provided with recycling bins, some were not, and some were provided with both recycling bins and education about the importance of recycling. The results of the study showed that students living in campus apartments significantly reduced their waste

stream when given recycling bins and some education about recycling. ANOVA tests did not allow for the conclusion that education increased the amount of recycling. Nonetheless, the researchers expressed confidence that the presence of both education and bins significantly reduced the waste stream, reflecting a confidence in sustainability education demonstrated in much of the current literature (Lamoreaux et al., 2003).

In addition to focusing on recycling programs, similar studies have been conducted around other campus sustainability programs. For example, Agyeman, Marcel, and Rappaport (2004) conducted a study at Tufts University in Medford, Massachusetts. Utilizing a community-based social marketing (CBSM) campaign, this study was conducted in a student housing setting in order to measure the effectiveness of attempts to reduce student electricity use and greenhouse gas emissions by utilizing CBSM methods. Two dormitories were used in the study. Residents of the control dormitory were exposed to an educational program on climate change detailing how their electricity and computer use creates greenhouse gas emissions. Residents of the experimental dorm were exposed to the same educational program as well as a social marketing campaign encouraging students to turn personal computers off when not in use. Pre- and post-surveys suggested that the social marketing campaign had a greater impact on student environmental knowledge, attitudes, and behaviors than the educational program alone (Agyeman et al., 2004). This study suggests that CBSM strategies can be effectively utilized to improve educational campaigns that strive to increase participation in campus sustainability programs.

The literature reviewed suggests that education, as well as community-based social marketing techniques, can play a role in the successful implementation of campus

sustainability programs such as recycling and energy conservation. This is important for educational leaders to consider as they invest time, money, and human resources into the implementation of a variety of campus sustainability initiatives. If campus stakeholders are unaware of the program's meaning, or are not provided with messages of encouragement to participate in the program, the likelihood of a high participation rate decreases (McKenzie-Mohr, 2011). Stakeholders need to understand the meaning behind the requested behavior changes, have clear and specific instructions on how to implement the changes, and be provided with an incentive to participate. In summary, the literature reviewed indicates that both stakeholder education and community based social networking activities can positively affect green campus initiative implementation efforts.

Infusing sustainability across the curriculum. One of the main roles of higher education is to teach people about ways they can influence the world around them including, but not limited to, culture, politics, economics, and the environment (Orr, 2004). To address sustainability in formal educational settings, a growing number of campuses are developing and expanding academic programs with this emphasis (Davis et al., 2010). College and university campuses are considered ideal places to inform society about environmental sustainability (Halfacre-Hitchcock & Owens, 2006). Academic departments can be expanded to include environmental sustainability courses and degree programs in a variety of disciplines. These programs have been referred to as "ecological literacy" (Orr, 1992) or "ecoliteracy" programs (Capra, 1999). The efforts to infuse sustainability across the curriculum have grown significantly over the last decade, and these efforts continue to grow at a rapid rate (Blewitt & Cullingford, 2009). Two studies

surfaced which focused on fostering ecoliteracy among non-environmental majors as well as implementing ecoliteracy course requirements into the core curriculum.

Although there are a number of ways in which educators may infuse sustainability across the curriculum, perhaps the simplest way is to integrate these concepts into existing courses. In some institutions of higher education, there are sharp boundaries between academic disciplines which may prevent the interdisciplinary work needed to create entirely new courses and degree programs (Blewitt & Cullingford, 2009). If this is the case, faculty may find it more effective to use these concepts in the courses they already teach in a variety of ways such as reading assignments, essays, projects, field trips, and/or film viewings. A major advantage to this is that it does not require review, coordination, or support beyond that of the involved faculty member, and resource demands are typically modest. The disadvantage is that the application is limited to the involved faculty and students in their particular courses (Rusinko, 2010).

If a deeper commitment to infusing sustainability across the curriculum is desired, then faculty can develop new courses or develop entirely new academic programs that lead to professional certificates or degrees at the associate's, bachelor's, master's, or doctoral levels. Infusing concepts of environmental sustainability into curriculum can help to break down traditional barriers in academia (Creighton & Rappaport, 2007). Ultimately, these disciplinary barriers must at least be blurred and allowed to overlap in institutions of higher education if environmental sustainability curriculum is to flourish.

A study conducted by Wolfe (2001) researched 4-year higher education institutions in the United States, examining the extent to which they provided for the environmental education of students in non-environmental majors, and to identify various approaches to

increasing eco-literacy in higher education settings. Chief academic officers were surveyed electronically. Of the 496 responding institutions (representing a 42% response rate), 11.6% indicated that an environmental literacy course was required of all students, and 55% reported that such a course was available and countable toward the institution's general education requirements. At least one environmental minor was offered at 33.7% of the institutions, and 39% reported the existence of an environmental academic program that offered a course appropriate for non-majors (Wolfe, 2001). This quantitative study showed evidence that there are several institutions across the United States that have infused sustainability across curriculum through specific courses, as well as entire academic programs, for both environmental majors and non-environmental majors. Although many institutions do not have such programs, this study demonstrates that a large number of campuses are working to integrate them into their academic programs.

Hartel and Moody (2007) conducted a study of awareness, support, and satisfaction with respect to ecoliteracy course requirements at the University of Georgia (UGA) in the fall 2005 and spring 2006 semesters. A total of 7,268 of the 13,740 students currently taking an ecoliteracy course and 86 of 100 faculty teaching eco-literacy courses were surveyed with a voluntary questionnaire on their awareness, support, and satisfaction for the requirement. The assessment involved 58 courses with 120 sections. The evaluation showed widespread support and satisfaction with the ecoliteracy course requirement. However, strong leadership, publicity, and continuous evaluation were needed to improve the requirement (Hartel & Moody, 2007). The results of this study support the effectiveness of an ecoliteracy course as a method chosen to foster ecoliteracy among

students. The researchers argue that more universities should adopt ecoliteracy courses. However, they conclude that ecoliteracy ought to be infused into the larger university curriculum in order to attain the most effective outcome.

In addition to these two studies, the reviewed literature exposed a variety of conceptual and descriptive articles and books written specifically about the significance of environmental sustainability curriculum and co-curriculum on college and university campuses. In terms of higher education institutions in the United States, Bartlett and Chase (2004) arguably presented the most comprehensive collection of such literature in their book, *Sustainability on Campus: Stories and Strategies for Change*. Their book is a compilation of practices from experts in the field who have utilized diverse approaches to infusing sustainability across the curriculum at various institutions of higher education.

As discussed in this book, one of the first and most prominent attempts to infuse sustainability across the curriculum at a university has been referred to as the Ponderosa Project at Northern Arizona University. This project consisted of a faculty development program that included representatives from a variety of academic disciplines. Workshops were held to have faculty from diverse disciplines work together to brainstorm ways in which sustainability could be integrated into the curriculum in the form of either new academic programs, new courses, or simply an emphasis in existing courses (Bartlett & Chase, 2004). By providing faculty with stipends for both their time engaging in the workshop and then developing curriculum after the workshop, a community of practice was built that encouraged collaboration across traditional disciplines. The Ponderosa Project culminated into a successful example of a university-wide faculty commitment to infusing sustainability across the curriculum (Bartlett & Chase, 2004).

Research for Environmental Sustainability

The third area of practice involves environmental sustainability research conducted at colleges and universities. Of the four areas of practice that are framing the discussion of practice in this literature review, this area of research is written about the least. Although there is minimal literature on this subject, there is much to consider in this area. The literature reviewed in this area falls into two general sub-categories: (1) Research conducted by campuses, and (2) Developing models for the larger community. This breakdown can also be thought of in terms of the practice of research and the dissemination of results from that research pertaining to the campus itself. By training researchers, conducting quality research, and developing models for the larger community, college and university campuses are uniquely positioned to lead the way to a sustainable future (Calder & Dautremont-Smith, 2009).

Research conducted by campuses. Research universities are the primary places where researchers are educated and trained. They are also places where some of the most important, highest-quality research is conducted on a wide variety of subjects. The field of environmental sustainability is no exception. As would be expected, much of the research conducted on this subject comes out of the academy (Aber, Kelly, & Mallory, 2009). Campuses across the globe have developed an emerging area of research on this subject, of which this literature review has explored. Nearly all of the empirical research referenced in this literature review consists of studies that were conducted at one or more institutions of higher education. Moreover, much of the conceptual and descriptive literature referenced in this literature review was written by scholars who hold academic positions. Often, the scholars who conduct research on campus sustainability are

studying their own campuses to ascertain if progress has been made. In other cases, scholars are researching other campus settings in an attempt to understand these issues more broadly.

The literature reviewed revealed a number of references to the idea of colleges and universities serving as living laboratories for faculty and students, where they can gain hands-on, experiential learning and research opportunities that are both curricular and co-curricular in nature (Bardaglio & Putnam, 2009; Creighton, 1998; Creighton & Rappaort, 2007; M'Gonigle & Starke, 2006; Simpson, 2008). Many scholars argue that colleges and universities have a responsibility to conduct research on sustainability, in particular with respect to climate change, because these institutions are the most well-suited organizations to lead these efforts (Bartlett & Chase, 2004; Crieghton & Rappaport, 2007; Cortese, 2003; Orr, 2004). As this research is conducted and compiled over time, the larger community benefits by being exposed to new ideas for practice. By conducting cutting-edge research, college and university campuses are able to develop models for the larger community that demonstrate sustainable practices.

Developing models for the larger community. Green campuses have emerged in both the public and private higher education sectors, as well as at all types of higher education institutions including community colleges, 4-year universities, and research-based institutions. Examples of model or exemplary campuses below help to make the practices described above more concrete. Some of the exemplary green campuses noted in the literature are the top-tier leading institutions, while others are lesser known, smaller campuses. Although each of these institutions is unique, they also share many common threads in terms of how they have prioritized the role of environmental sustainability

within the institution, as well as developed models for the larger community to utilize in wider efforts to build sustainable communities.

Harvard University. It can be well argued that Harvard is the most prestigious college or university in the world. This being so, it is a natural fit that Harvard is a leader in sustainability, as they are a leader in so many other arenas. As of 2009, Harvard maintained the largest number of LEED® certified green buildings of any college or university in the world (Princeton Review, 2010). Harvard is also well-known in the campus sustainability field for developing a large revolving loan fund to pay for new environmental sustainability initiatives. The campus devised a $12 million Green Campus Loan Fund that provides interest-free capital for campus sustainability investments that have a payback period of 10 years or less (Bardaglio & Putnam, 2009). This fund allows campus departments to upgrade the efficiency and functionality of their facilities without incurring capital costs. Harvard's revolving loan fund generated a 30% return on investment (ROI) in 2005, which was higher than their endowment ROI of approximately 19% in the same year (Bardaglio & Putnam, 2009).

University of California, Santa Barbara. The University of California (UC) system maintains a system-wide commitment to environmental sustainability. Perhaps the most notable single institution in the UC system is University of California, Santa Barbara (UCSB). As a signatory of the Talloires Declaration in 1990, UCSB made a commitment to sustainability toward the beginning of the modern campus sustainability movement (Princeton Review, 2010). Additionally, as a signatory of the ACUPCC, UCSB has committed to becoming a climate neutral campus by 2050. UCSB is well-known for its Bren School of Environmental Science and Management, one of the strongest

environmental sustainability curriculum programs in the nation. Bren Hall was the first building to earn two LEED® Platinum ratings. In 2009, Bren Hall received a Platinum certification for Existing Buildings—Operations and Maintenance. This certification comes 7 years after Bren Hall opened in 2002 as the greenest laboratory facility in the nation, and the first to be certified LEED® Platinum for New Construction (UCSB, 2009). The National Wildlife Federation Campus Ecology Program recognized UCSB as a university that leads on transportation issues, recycling efforts, and green landscaping programs (McIntosh, Gaalswyk, Keniry, & Eagan, 2008).

Arizona State University. The first degree-granting school of environmental sustainability in the United States was formed at Arizona State University in 2006 (Bardaglio & Putnam, 2009). This program arose from a larger effort to transform ASU from having specialized academic training to becoming a more interdisciplinary-focused institution. ASU's School of Sustainability opened in fall 2007, and offers degrees at the bachelor's, master's, and doctoral levels, as well as a professional certificate (Princeton Review, 2010). By merging at least 35 individual disciplines, ASU has created one of the most thriving academic environmental sustainability programs in the United States (McIntosh et al., 2008). These initiatives were led by President Michael Crow, who took over as President of ASU in 2002. As one of the most environmental sustainability-focused college or university presidents in the nation, President Crow was described by *Newsweek* as overseeing one of the most radical redesigns in higher education since the modern research university took shape in 19th century Germany (Theil, 2008).

College of the Atlantic. College of the Atlantic (COA) is a small environmental liberal arts college in Bar Harbor, Maine, that is well-known for its far-reaching

environmental sustainability efforts. One of the most unique features of this campus is that students only have one choice as their major: a Bachelor of Arts in Human Ecology. Although there is technically only one major, there is significant flexibility in terms of the classes students can take and the approaches they can take toward earning this degree. COA is considered by many in the field to be the first campus in the United States to achieve climate neutrality, meaning that there is a net-zero impact on climate change originating from the activities of the COA campus.

Top-down leadership from the campus president helped COA to push an aggressive campus sustainability agenda through in a relatively short amount of time (Bardaglio & Putnam, 2009). College of the Atlantic provides local and organic food that is grown on its on-campus organic farm to its students and staff. The COA campus farm supplies the cafeteria with seasonal produce. Moreover, all of the food waste generated at COA is composted, with designated composting bins in the dining service areas as well as every residence hall (Princeton Review, 2010). The National Wildlife Federation Campus Ecology Program recognized COA as a leader in sustainability goal-setting, involving faculty in sustainability initiatives, and hiring staff to lead campus sustainability efforts (McIntosh et al., 2008). In 2008, *Forbes Magazine* included COA as one of the nation's greenest campuses, highlighting the fact that Human Ecology is the only major offered at the college (Wingfield, 2008).

External Community

The fourth area of campus sustainability practice involves the external community. Although colleges and universities are often thought of in terms of their geographical boundaries, as organizations they have a much broader impact on the rest of the world. It

is important for campuses to maintain a positive public image, as well as good relations with external stakeholder groups. Moreover, assessment and evaluation should be conducted so that a particular campus can understand how effective its green practices are. It is also important to be able to compare one institution to another, so that individual campuses know how well they measure up to their peers. By conducting assessments and evaluations, campuses are able to interpret their progress in implementing green practices to the external community.

Building sustainable partnerships. It is important for institutions of higher education to maintain good working relationships with their external community for a number of reasons. For example, they often form strategic partnerships with government agencies, non-profit organizations, and corporations for a variety of reasons such as conducting research, developing new technologies, and facilitating the creation of new jobs (Bardaglio & Putnam, 2009). There are a number of trade groups, associations, and other external organizations that promote environmental sustainability in higher education. Organizations such as the Association for the Advancement of Sustainability in Higher Education (AASHE), Second Nature, and the University Leaders for a Sustainable Future (USLF) are nationally and internationally known for their leadership roles in promoting and facilitating campus sustainability efforts through conferences, publications, research, and various communication forums (Calder & Dautremont-Smith, 2009). Organizations such as these are critical catalysts in this field, providing the networking and information-sharing opportunities needed to support campuses in working with external peer groups to learn from each other and work toward common goals (Simpson, 2008).

Assessment and evaluation of campus sustainability initiatives. Over the past decade, there has been an increase in the number of assessment and evaluation programs that strive to quantify the effectiveness of campus sustainability initiatives. One of these programs was organized by the National Wildlife Federation's (NWF) Campus Ecology™ program. The NWF published two extensive studies in which they attempted to capture the state of campus sustainability implementation efforts in the United States. In 2001, NWF published the *State of the Campus Environment Report* which used surveys from 891 institutions to capture a snapshot of how well colleges and universities were doing in their efforts to implement green initiatives (McIntosh et al., 2001). The 2001 NWF report compiled data from all 891 campuses, presenting findings that applied generally to all of the campuses. Institutions were clustered into geographical regions instead of named individually, and letter grades ranging from an "A" to an "F" were assigned to individual program types rather than to individual institutions (McIntosh et al., 2001). Key findings of the 2001 NWF report indicated that recycling was the strongest campus environmental program, lighting retrofits were the most popular energy conservation strategy, and that setting and reviewing goals was the most effective management strategy. Areas that were reported as needing improvement included environmental literacy of students, campus transportation programs, and the level of staffing provided for campus environmental programs (McIntosh, Cacciola, Clermont, & Keniry, 2001).

A similar publication was later developed by NWF, entitled *Campus Environment 2008: A National Report Card on Sustainability in Higher Education*. The 2008 report included a total of 1,068 participating campuses, representing 27% of all campuses in the

United States (McIntosh et al., 2008). As a follow-up to the 2001 NWF study, the 2008 study provided a comparison utilizing the same methods and framework as the original study. All campuses surveyed were clustered together, and the survey results were discussed in terms of whether or not there was an overall "upward" trend toward progress, or a "downward" trend indicating the need for improvement (McIntosh et al., 2008). The findings of the 2008 NWF study noted an upward trend in the greening of day-to-day operations of the campus, with improvements made in terms of conserving water, increasing energy efficiency, and implementing renewable energy systems (McIntosh et al., 2008). The NWF 2001 and 2008 surveys served as one of the first comprehensive attempts to assess and evaluate campus sustainability initiatives.

The Sustainable Endowments Institute (2010) developed a program called *The College Sustainability Report Card* which utilizes a set of four surveys to gather information regarding green campus efforts. The four individual surveys utilized consist of a general campus survey, a dining survey, an endowment survey, and a student survey. All four of these surveys were used to assign campuses a final grade of an "A" to an "F." In 2010, *The College Sustainability Report Card* surveyed 332 schools. Key findings from the 2010 study included more than one-half of the schools earning an overall grade of "B-" or better.

Another prominent assessment and evaluation system is organized by The Princeton Review. Partnering with the U.S. Green Building Council in the development of the Guide to 286 Green Colleges, The Princeton Review utilized a mixed-method survey sent out to 2,000 campus administrators, with the goal of answering the following research questions: (1) Do students have a campus quality of life that is both healthy and

sustainable; (2) How well is the school preparing students for employment in the green economy; and (3) How environmentally responsible are a school's policies? (Princeton Review, 2010). Of the 2,000 campuses surveyed, 286 schools were chosen to be highlighted in the final publication (Princeton Review, 2010).

The Association for the Advancement of Sustainability in Higher Education (AASHE) has developed a new system to track campus sustainability progress called the STARS® program or the Sustainability Tracking, Assessment and Rating System. The STARS® program is a voluntary, self-reporting framework for assessing and gauging relative progress toward sustainability for colleges and universities. There are three major categories in the STARS® system: (1) Education and Research; (2) Operations; and (3) Planning, Administration and Engagement. Within each of these major categories, there are various sub-categories which each contain a specified number of credits that can be earned for environmental sustainability efforts that meet the respective criteria for that credit. Once all of the earned credits are tallied, STARS® will provide a particular rating for each campus. The rating is categorized in a tiered system ranging from "Bronze" to "Platinum." This rating system was designed in a similar manner to the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED®) program for certifying green buildings. Although STARS® is a new program at the time that this literature review is being conducted, it resulted from several years of development utilizing a collaborative, inclusive process which tapped into a wealth of expertise in the campus sustainability professional community (Bardaglio & Putnam, 2009).

The Process of Implementing Campus Sustainability Initiatives

The previous section discussed green campus practices in the context of higher education. Some scholars have argued that all institutions of higher education ought to be completely transformed into green campuses to meet the incredible challenges of the future (Orr, 2004). However, even if a campus has this as a goal, the transition entails engagement in a complex process. The process of implementing campus sustainability initiatives in higher education may be as complex, if not more complex, than the practices themselves. It is one thing to develop and implement a method for saving energy, reducing water consumption, or educating students. It is another thing entirely to engage in the process of implementing that change in a particular organization. The following section explores the process of implementing campus sustainability initiatives in detail, with an emphasis on change in higher education settings.

Organizational Change in Higher Education

The process of implementing campus sustainability initiatives functions within a particular type of organizational culture that is unique to higher education settings. The literature demonstrates that the implementation of environmental sustainability initiatives often involves making significant organizational changes as discussed in the previous section on green campus practices. In order to understand the process of making such changes within the context of a higher education setting, it is important to address the literature that is focused on change in higher education.

A review of the literature regarding change in higher education revealed a wide range of books, articles, and other writings on the subject. Boyce (2003) compiled a comprehensive literature review on the subject of organizational change in higher

education, providing a detailed overview of the subject. She outlined the major positions held by scholars on this topic, citing seminal works as well as a variety of other relevant literature that addresses issues of change in higher education. In addition to her own ideas about change in higher education, Boyce reiterated what scholars have pointed out for decades about change in higher education, namely that colleges and universities are loosely coupled systems with diffuse decision making processes and ambiguous goals, and that when change does happen in higher education, it is slow.

A slow and difficult process. As many scholars have noted, change in higher education is typically slow and incremental, developing over decades rather than years (Cuban 1999; Kerr 2001; Weick 1976, 1982). Moreover, change in higher education is often difficult to implement (Boyce, 2003; Clark 1992). Certainly it can be argued that institutions of higher education are dynamic and do, in fact, change on a regular basis (Boyce 2003; Cohen & March, 1986). However, scholars have articulated the difference between minor adjustments that occur within the context of higher education settings, and more radical shifts. The process of implementing environmental sustainability initiatives in higher education settings involves making minor adjustments as well as radical shifts throughout a college or university. Minor adjustments occur as part of typical organizational development processes over time as new individuals join the organization and help the organization respond to ever-changing circumstances. But bigger changes, the types that fundamentally alter the fabric of an institution, are rare and are more likely to be implemented in an incremental manner (Birnbaum, 1988; Boyce, 2003; Clark, 1992; Cohen & March, 1986; Cuban, 1999). As Kerr (2001) indicated, institutions of higher education are typically conservative institutions that will not initiate significant

change unless they are pressured to. Thus, effective change in higher education often must be initiated and implemented with specific strategies in-place. Moreover, a high level of persistence is often needed in order to sustain the changes that are initiated.

Cuban (1999) discusses the need to embrace the fact that higher education change is often incremental, but warns leaders in these settings not to merely implement a series of ad hoc changes. Alternatively, he argues that effective change in higher education may be achieved through implementing incremental changes in a strategic manner, which he describes as short-term "tinkering" in order to reach long-term goals (Cuban, 1999). Although Cuban was discussing change in higher education within the context of a case study he conducted at Stanford University focused on the prioritization issues between research and teaching, it can be argued that his insight is transferable to a variety of change issues in higher education such as the implementation of campus sustainability initiatives.

First- and second-order changes. Scholars often distinguish between what is referred to as "first-order" and "second-order" change. First-order change is described by Boyce (2003) as an incremental, linear type of change that functions within the context of a status quo system. Most of the changes that occur within an institution of higher education as a part of daily operations are first-order changes. When first-order changes are implemented, the results are typically simple modifications to a larger system that is already well-defined and organized. First-order changes can consist of efficiencies, upgrades, modifications, or alterations of a system. By implementing a series of well-thought out first-order changes, educational leaders can "tinker" with the various parts of

green campus initiatives until an effective solution is found. As discussed above, this tinkering can lead to, or facilitate, second-order changes (Cuban, 1999).

Using the context of campus sustainability as an example, if a campus chooses to select new light bulbs that are more energy efficient than the current light bulbs to save money and energy, this could be considered to be an instance of a first-order change. In this case, an efficiency of a system was implemented. However, the foundational assumptions, values, and purpose of the system itself are not questioned or challenged in any fundamental way.

It can be argued that first-order changes are relatively simple to implement. However, second-order changes are quite different. Unlike first-order changes, second-order changes permanently transform an organizational system. Foundational assumptions, values, and purposes are questioned, challenged, and changed. A second-order change can be thought of as a type of paradigm shift (Kuhn, 1962; Simsek & Louis, 2000). Second-order changes alter the mission and vision of an institution, and fundamentally change the fabric of the institution (Kezar, 2001). As may be expected, second-order changes are much more difficult to implement.

One second-order change related to sustainability that many campuses are struggling with is the idea of climate neutrality. Organizations such as the American College and University Presidents Climate Commitment (ACUPCC) are strongly encouraging institutions of higher education to actively and quickly work toward the development of carbon neutral campuses (ACUPCC, 2010). This type of sweeping change completely alters the way a campus makes decisions about financial investments, campus policies, and corresponding practices. Moving toward climate neutrality typically entails

sweeping changes in policies and practices, requiring that the majority of the campus community change behaviors to conserve resources and reduce environmental impacts. Implementing a second-order change like this can often be a slow and difficult process if it ever occurs at all. However, by tinkering with and implementing a series of first-order, incremental changes, educational leaders may be able to pave the way toward second-order change (Cuban, 1999). Ultimately, implementing environmental sustainability initiatives in higher education settings requires implementing a series of both first- and second-order changes that, working in concert, can significantly transform an individual college or university.

The degree to which an individual campus is changed due to the implementation of environmental sustainability initiatives is contingent upon the scope and magnitude of the combination of first- and second-order changes made. As mentioned previously, this can also be understood in terms of a "strong" versus a "weak" approach to environmental sustainability. The more second-order changes supporting sustainability that are implemented, fundamentally altering the ways in which a college or university conducts business, the "stronger" the approach to environmental sustainability will be. If campus sustainability initiatives are approached through mostly a series of first-order changes, without fundamentally changing the paradigms within which the campus operates and makes decisions, then the result will most likely be a "weaker" approach to environmental sustainability (Sterling, 2004).

The specific changes made in institutions of higher education involving the implementation of environmental sustainability initiatives are site-specific and thus must be understood on a case-by-case basis. These changes may or may not be well-received

by the multitude of stakeholders within a higher education setting. This can particularly be the case when making more significant, second-order changes. Often the actions required, whether first- or second-order changes are made, require individuals to change their habits or routines that they have maintained for several years, sometimes several decades (Creighton, 1998). Additionally, effective leadership across institutions of higher education is needed in order for the process of implementing environmental sustainability initiatives to be successful. Stakeholders from students, staff, and faculty all the way up to presidents and chancellors have a role to play in leading this process. The process of making the first- and second-order changes needed to implement campus sustainability initiatives can be such a transformative process that it can require a high level of collaboration between various campus constituents (KcKenzie-Mohr, 2011).

Reframing Organizations

As actors from all sectors and cultures of a college or university strive to understand the complex processes involved with managing campus affairs and facilitating change, it can quickly become difficult to make sense out of the inner-workings of the organization as a whole. Instead of grappling with this challenge from just one perspective, it can be much more efficient and effective to employ a conceptual model to assist in the meaning making process. Bolman and Deal (2008) developed the concept of "reframing organizations" to assist in this process. A frame is described by Bolman and Deal as a mental map, or a set of assumptions that we project onto the world as we strive to make meaning out of our organizational lives. Frames can also be thought of as tools for navigating various types of terrain within an organization, analogous to how one might

use a map to find directions to a particular destination. Four frames were proposed by Bolman and Deal: (1) Structural, (2) Human Resource, (3) Political, and (4) Symbolic.

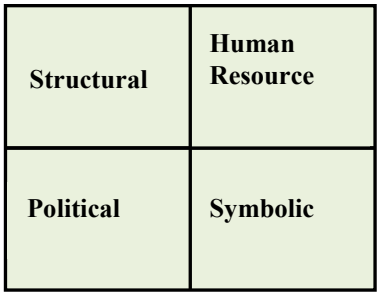

FIGURE 5. Bolman and Deal's (2008) Four Frames conceptual framework for viewing organizations through multiple lenses.

Each of these four frames provides a specific lens through which an organization can be understood, offering four diverse perspectives that produce unique types of knowledge. By utilizing all four of these frames, actors operating within an organization such as a college or university are better-equipped, the authors argue, to deal with the inherent confusions one will encounter in the process of developing an understanding of that organization (Bolman & Deal, 2008). Reframing can be an effective strategy for understanding how institutions of higher education implement change initiatives, including those related to environmental sustainability.

Structural Frame

The structural frame focuses on understanding the architecture of the organization, including dimensions such as goals, plans, and policies which greatly influence the decisions people make and the activities in which they engage (Bolman & Deal, 2008). The structure of an organization simultaneously shapes and constrains the individuals

operating within the organization. There are countless ways in which organizations can be structured, depending on the ideas, preferences, and capabilities of those who design an organization's structure, as well as the context and nature of the organization's work and goals. For the purposes of this study, applying the structural frame to the analysis of a particular institution can assist in building an understanding of how a university implements a comprehensive environmental sustainability initiative. Two of the most important components of a structural analysis of environmental sustainability initiative implementation are financial resources and staffing.

Financial resources and economic incentives. Although there may be support for the concept of environmental sustainability on many college and university campuses, it is often challenging for educational leaders to determine the ways in which to invest financial resources to support these efforts. Throughout the review of literature for this study, the topics of economics and finance surfaced in a number of ways. Much of the literature on campus sustainability discusses economics and finance in terms of specific methods for funding green initiatives as well as financial incentives associated with implementing them. The literature that discusses methods for funding these initiatives discusses a variety of specific funding mechanisms such as grants, donations, student "green" fees, revolving loan funds, government rebates and tax incentives, bonds, power purchase agreements, renewable energy certificates, and carbon offsets (Barlow, 2009). Perhaps the most significant example of an economic incentive based on a campus sustainability initiative is culminated in the implementation of building practices, known in the industry as the "green building" movement (Kats, 2010).

The implementation of green initiatives, particularly with respect to campus facilities, is often cited as leading to cost-savings over time, but requiring large initial investments of campus financial resources (Bardaglio & Putnam, 2009; Barlow, 2009). This can leave campus decision-makers in a quandary as they strive to balance the needs of the present and future with the fiscal constraints that exist at any given point in time. A prime example of this is participation in the U.S. Green Building Council's Leadership for Environmental Energy and Design (LEED®) certification and rating program for sustainable building projects. Although the potential for substantial cost-savings resulting from the implementation of LEED® green building projects has been well-demonstrated (Holowka, 2008; Kats, 2006; Matthiessen & Morris, 2007), it may be too early to conclusively tell if these cost-savings have been realized on a large scale since the cost-savings associated with green building efforts are calculated on a time scale that considers the entire life of the building (Kibert, 2008).

It is difficult to speak generally about the added up-front costs associated with building green. It has been estimated that constructing a LEED® certified building can cost anywhere from less than 1% to over 10% more than a conventional building in terms of the initial cost, depending on the particular building (Kats, 2010). However, it has also been argued that LEED® buildings have a high return on investment over time when viewed from a wider perspective that includes factors such as reduced operating and maintenance costs, increased occupant health benefits and higher worker productivity, as well as public relations and marketing benefits (Fedrizzi & Yudelson, 2008).

As campus decision-makers work toward implementing environmental sustainability initiatives, financial analyses must be incorporated from the beginning of the process

(Barlow, 2009). Although all campuses are unique, they all have one thing in common: the need to secure funding. The lack of funding can be a major barrier to implementing campus sustainability initiatives (Blackburn, 2007). Thus, it is imperative that campuses identify sources of funding and make a strong business case for proposed changes.

Hiring staff with expertise. Having the right structure within an organization ultimately depends on hiring the right individuals to do the specialized work around environmental sustainability. Across the nation, college and university campuses are hiring staff with environmental sustainability expertise to manage and implement green campus initiatives at a rapid rate, a clear indication that campuses are increasing levels of commitment to these issues (Creighton & Rappaport, 2007). The titles for these positions range from "Sustainability Coordinator," to "Sustainability Officer" or "Director of Sustainability," as well as several other variations.

A study conducted by the Association for the Advancement of Sustainability in Higher Education (AASHE) was published in 2008 to promote a greater understanding of this emerging field and the professionals who are driving it (Matson, 2008). The quantitative study consisted of an on-line survey sent out to members of AASHE in the United States and Canada, as well as through posts on sustainability e-mail discussion lists. There were 70 responses to the survey, but only 62 met the criteria of the researchers and were able to be utilized for analysis. The 62 respondents represented approximately 75% of the campus sustainability professionals known by AASHE at the time of the study. The results of the study indicate that 90% of the positions were created within the last 10 years and 7% in the last 5 years. The AASHE study also found that the most common impetus to create a sustainability coordinator position was an administrator

champion who pushed for it. Findings from the study showed that 32% of these positions were housed in a facilities office and 31% were housed in a formal campus sustainability office, with the remainder of them housed in various other departments. The overwhelming majority of the positions (82%) were funded by general fund monies, with the rest of the positions being funded through various other means including grants, student fees, or other fund-raising efforts.

By hiring qualified individuals to do the work of implementing environmental sustainability initiatives, educational leaders will be more likely to experience success in implementing green campus initiatives. Moreover, by providing professional development for sustainability staff so that they can keep up with this rapidly growing field, educational leaders can continue to be on the cutting-edge of campus sustainability.

Human Resource Frame

The human resource frame developed by Bolman and Deal (2008) focuses on the significance of people within organizations. As important as it is to understand an organization in terms of its structure, politics, and symbolism, it is also imperative to acknowledge the individual actors who comprise an organization. The human resource frame sees a synergistic relationship between an individual and an organization such that if both parties contribute to a set of common goals, then the outcome ought to provide more for each party than they could otherwise achieve alone. Likewise, if one or both parties do not work to benefit one another, then neither party will result with a positive outcome. Bolman and Deal (2008) explain that a good relationship of this sort will result in individuals finding meaningful and satisfying work as well as an organization developing the talent and energy needed for success. This perspective can be directly

applied to a higher education setting within the context of environmental sustainability initiative implementation. If campus sustainability initiatives are to be implemented successfully, there must be a dedicated group of individuals, often referred to as "change agents," supporting such initiatives throughout the institution (McKenzie-Mohr, 2011).

The literature reviewed indicates the importance of environmental sustainability committees as group structures that can assist individuals from diverse areas of campus in working together toward common goals. Additionally, perhaps the most significant human resource issue to address in terms of environmental sustainability initiative implementation is the faculty. At the end of the day, it is the relationship between faculty and students that is at the heart of higher education. Thus, colleges and universities are facilitating an interdisciplinary faculty culture that encourages individual faculty members to collaborate across traditional academic boundaries to address the overlap between the environmental, social, and economic spheres of sustainability.

Sustainability committees. The review of literature demonstrates the value of interdisciplinary committees focused on campus sustainability issues (Bartlett & Chase, 2004; Creighton, 1998; Creighton & Rappaport, 2007). One of the most effective ways to involve multiple, diverse stakeholders in the environmental sustainability initiative implementation process is to have representatives from administration, staff, faculty, and students meet on a regular basis to share ideas, set goals, and execute mutually agreed upon plans. In the literature focused on environmental sustainability in business, there are frequent mentions of the significance of "green teams," "steering committees," "task forces" and other project teams that focus on environmental sustainability, which can be viewed as virtually synonymous with environmental sustainability committees

(Anderson, 2009; Blackburn, 2007; Hitchcock & Willard, 2008; Olson, 2010). Creighton and Rapport (2007) argue that faculty ought to serve on committees that can influence action on campus sustainability issues, because working more closely with administrators, staff, and students can create a synergy that would not otherwise be possible. The role of a sustainability committee is to encourage communication and collaboration among all individuals involved.

Facilitating an interdisciplinary faculty culture. Perhaps the most significant human resources on a college or university campus are the faculty. The review of literature revealed a consensus that, in order for a comprehensive environmental sustainability initiative to be implemented on a campus, an interdisciplinary faculty culture must be developed and cultivated (Bartlett & Chase, 2004; Blewitt & Cullingford, 2009; M'Gonigle & Starke, 2006). Although traditionally faculty can be bound by the confines of their individual disciplines, especially with respect to teaching and research activities, academia now faces the challenge of facilitating an interdisciplinary faculty culture around environmental sustainability that rewards scholarship which crosses traditional departmental boundaries (Calder & Dautremont-Smith, 2009; Creighton & Rappaport, 2007). As mentioned previously, colleges and universities across the nation are working on a variety of ways to infuse sustainability across the curriculum. Although this practice is well documented in the literature, there is much less research focused on the process of facilitating an interdisciplinary faculty culture.

Of the studies reviewed, only one stood out as being directly relevant to the process of facilitating the type of interdisciplinary faculty culture that would support the implementation of a comprehensive environmental sustainability initiative. Davis,

Edmister, Sullivan, and West (2003) conducted a study to learn about the dynamics involved in integrating concepts of environmental sustainability into existing courses. This study was in the form of a qualitative cross-case analysis, comparing two institutions of higher education that have demonstrated significant progress in having faculty integrate the concepts of environmental sustainability into their teaching. The two universities that were studied were Northern Arizona University (NAU) and the University of South Carolina (USC). At NAU, 8 faculty members, 3 administrators, and 17 students were interviewed. At USC, 9 faculty members, 3 administrators, and 14 students were interviewed (Davis et al., 2003).

Several themes emerged from the findings of this study. First, the colleges studied required strong institutional commitments to environmental sustainability in the form of mission statements, goals, objectives, or policies. Second, educational leaders at the institutions studied maintained strong beliefs that environmental sustainability ought to be integrated into teaching. This belief translated into the campuses providing developmental training for faculty. However, although faculty viewed the training as valuable, they did not necessarily feel rewarded for their efforts of incorporating environmental sustainability into their teaching. Third, a variety of classroom approaches were utilized on each of the campuses studied, including assigned readings, class projects, and class discussions. Finally, the study indicated that both faculty and students required a combination of personal commitment and involvement in campus initiatives to effectively develop personal knowledge of environmental sustainability (Davis et al., 2003).

These findings echo the sentiments expressed in the literature discussed previously on the practice of infusing environmental sustainability across the curriculum. If academia is going to lead the charge of educating society about the significance of environmental sustainability, faculty must be given the support needed to achieve this goal, and they must be appreciated and rewarded for their achievements in this endeavor (Bartlett & Chase, 2004).

Political Frame

The political frame developed by Bolman and Deal (2008) views an organization as a network of individuals and units competing for scarce resources within the organization. This competition for scarce resources results in the forming of alliances and coalitions which vie for power within the structure of the organization, causing conflict in numerous ways. Looking through the lens of the political frame, the role that political power plays in an organization is brought to the forefront. Organizations consist of many individuals who each have a certain amount of power or political capital. The more political capital an individual has, the more influence or power that individual has within the organization. As individuals within an organization form alliances and coalitions based on mutually agreed upon goals, values, and/or understandings, power struggles ensue which can lead to conflict that can be unhealthy for the organization as a whole. The authors argue that all individuals within an organization have a responsibility to utilize their personal political capital in a positive, constructive way. It is up to the leaders of the organization to map the political terrain of an organization in order to build the relationships needed to negotiate and resolve conflicts, hopefully leading to outcomes that are mutually beneficial for all parties involved.

In the context of environmental sustainability initiative implementation, the political frame can be employed to better understand the ways in which individual change agents and coalitions of individuals working on environmental sustainability initiatives can most effectively utilize their political capital. The literature reviewed emphasized the significance of engaging stakeholders to build support for environmental sustainability initiatives as being of great importance for the overall success of environmental sustainability initiative implementation. Moreover, the literature discusses the critical role that organizational leadership plays in the process of implementing environmental sustainability initiatives. By building support through effective community engagement and strong organizational leadership, environmental sustainability initiatives can be implemented in a strategic manner that maximizes the political capital of all stakeholders involved in the implementation process.

Engaging stakeholders to build support. The process of implementing campus sustainability initiatives is largely dependent on how the individual change agents within a college or university work together toward achieving agreed upon goals. There is a need to involve multiple campus stakeholders when setting goals for environmental sustainability (Bartlett & Chase, 2004; Wright, 2002). Involving a variety of campus stakeholders including, administrators, faculty, staff, and students can assist in developing initiatives that are tailored to the individual institution. Moreover, the more stakeholders who are involved in the process, the more ideas there will be to draw from in the goal-setting process (Olson, 2010).

Although the review of literature revealed a dearth of formal research studies on the process of engaging stakeholders to build support for environmental sustainability

initiatives, one study was identified that addressed this concern. Moore (2005) conducted a study with a small team of researchers who engaged a large number of stakeholders in a dialogue about environmental sustainability education at the University of British Columbia (UBC), Vancouver, Canada. Through a series of workshops using a "value focused thinking" framework, recommendations were collected from workshop participants, consisting of individuals involved with implementing environmental sustainability programs at UBC, regarding how to most effectively implement environmental sustainability initiatives. To complement the workshops, data from 30 follow-up interviews of participants connected with decision-making and environmental sustainability at UBC were conducted.

Seven recommendations resulted as emergent themes: (1) Infuse sustainability into all decisions; (2) Promote and practice collaboration; (3) Promote and practice transdisciplinarity; (4) Focus on personal and social sustainability; (5) Integration of planning, decision-making and evaluation; (6) Integration of research, service and teaching; and (7) Create space for pedagogical transformation (Moore, 2005). Moore's (2005) study provides insight into a process that might be useful for educational leaders who are attempting to solicit feedback from various campuses regarding environmental sustainability. Additionally, the results from this study echo many of the recommendations that are provided by professional trade organizations such as Second Nature and AASHE.

Symbolic Frame

The symbolic frame was developed by Bolman and Deal (2008) to describe the processes involved in making meaning within an organization. Organizations are

complex and dynamic entities that easily escape simple definitions. In an effort to capture a sense of purpose and meaning in an otherwise chaotic system, people create symbols to represent the innately elusive and ever-changing definitions of an organization. Bolman and Deal describe organizations viewed through the lens of the symbolic frame in terms of culture, made transparent through myths, values, and vision that collectively tell a story about an organization's origin, identity, and ideology.

Organizations express their culture in numerous ways, such as developing formal mission, vision, and value statements. Moreover, organizations create non-verbal symbols such as logos, emblems, signs, insignias, and other images that express the essential meaning or purpose of an organization. Symbolism can also be found in the design and decor of buildings, methods utilized for communicating messages, and plans developed for organizing events. If organizations are viewed as being inherently difficult to define, then the strength of symbolism can be understood as having a high level of significance. As individuals strive to understand the organizations that they are part of, a symbolic understanding can provide much insight. This symbolic understanding of the organization can assist all campus community members in connecting with green campus initiatives. By strengthening these cultural connections, the symbolic frame can help educational leaders to facilitate the changes needed for transitioning to green.

Campus sustainability declarations and commitments. One of the most significant examples of symbolism in higher education with respect to the process of campus sustainability initiative implementation is the adoption of declarations and commitments. By signing or otherwise committing to the terms of these agreements, educational leaders express a symbolic promise to uphold a particular set of values and make decisions

guided by a specific vision. Over the last two decades, an increasing number of campuses have urged their leaders to commit to this movement in a formal, symbolic manner.

The most notable early symbolic declaration in higher education in support of sustainability is the Talloires Declaration. This historic document was composed in 1990 at an international conference on The Role of Universities in Environmental Management and Sustainable Development, held in Talloires, France at the Tufts University European Center. It is the first official statement made by university administrators of a commitment to environmental sustainability in higher education. It includes a concise introduction identifying the urgent need for leadership from higher education and a 10-point action plan for incorporating environmental literacy and environmental sustainability into university teaching and practice (University Leaders for a Sustainable Future [ULSF]; 1990). Over 350 colleges and universities have signed this declaration. Signing the Talloires Declaration is a symbolic commitment to sustainability in higher education that is recognized globally.

More recently, the American College and University Presidents' Climate Commitment (ACUPCC) has emerged as the leading symbolic agreement made toward environmental sustainability in higher education within the United States and Canada. The ACUPCC began in 2006, and has been signed by over 675 colleges and universities. These presidents and chancellors have committed their institutions to take the steps necessary to reach climate neutrality as well as to educate students about sustainability. This process is known as climate action planning (Creighton & Rapparort, 2007).

ACUPCC signatories agree to submit three reports semi-annually: (1) Greenhouse Gas Report, (2) Climate Action Plan, and (3) Progress Report (ACUPCC, 2010).

There is a gap in empirical research that addresses the process of implementing campus sustainability commitments and declarations. One of the most notable studies reviewed regarding campus sustainability declarations and commitments was conducted by Bekessy, Clarkson, and Samson (2007) at the Royal Melbourne Institute of Technology University in Australia. This study was conducted in order to assess the value of non-binding campus sustainability declarations like the ACUPCC. Using a timeline and analysis of historical documents, major trends in the process of implementing policies were identified. To complement the document review, 15 semi-structured interviews with university leaders and key environmental sustainability stakeholders from across the university were analyzed to provide insight into how and why the university had failed to achieve environmental sustainability (Bekessy et al., 2007). The results of this study indicated that non-binding international declarations do not necessarily lead to widespread adoption of environmentally sustainable practices, supporting the idea that the declarations are often primarily symbolic in nature.

In order to improve on declarations and policies for environmental sustainability, the researchers argued that two critical steps should follow the signing of declarations or implementation of policies. First, an appropriate, long-term budget should be assigned to ensure that adequate resources are available. Second, a university's progress and commitment should be exposed to public scrutiny in order to make a university more accountable (Bekessy et al., 2007). These recommendations may assist educational

leaders in determining whether to sign symbolic sustainability declarations and commitments.

Maintaining and presenting a green image. The environmental sustainability movement has gained significant momentum in society over the last decade, manifesting in a variety of changes to popular culture, the business world, municipal governments, and higher education. Organizations of all types are now expected to maintain a certain level of commitment to environmental sustainability (Hitchcock & Willard, 2008). This being the case, it is important for today's organizations to maintain a green image. Higher education is in a unique position because, not only are colleges and universities expected to be green institutions themselves, but they are also expected to be the primary places where people learn about environmental sustainability (Simpson, 2008). Thus, it can be a particularly challenging process for an institution of higher education to demonstrate its commitment to environmental sustainability to its constituency.

A recent study conducted by the Princeton Review, the 2009 *College Hopes and Worries Survey*, found that 66% of the prospective student respondents stated that they would value having information about a college's commitment to the environment. Moreover, 24% stated that such information would "very much" impact their decision to apply to or attend the school (Princeton Review, 2010). With at least a quarter of the prospective students on the market demanding that environmental sustainability be taken seriously at their institution of choice, colleges and universities must adapt. Modern campuses with these programs need to advertise and conduct outreach efforts to communicate their competitive edge in this arena by maintaining a green image.

A growing number of student activist groups among the millennial generation are utilizing their technological abilities to address sustainability issues and demand changes to the campus and curriculum (Bardaglio & Putnam, 2009). Through social networking on the internet, which can be instantly accessed on cell phones and other handheld devices, millennial generation students are revolutionizing the ways that they organize and implement changes on college and university campuses. These students are organized, and they want to take pride in attending a green campus (Edwards, 2010). Maintaining a green image includes providing symbolic messages to students on a regular basis utilizing a multimedia approach. Colleges and universities in today's world need to communicate in a variety of ways such as maintaining a sustainability website, publishing newsletters, producing short videos, sending out campus-wide e-mails, holding green events, and much more. By maintaining a green image, a college or university will be better able to attract and retain more students and faculty, ultimately leading to a more successful organization as a whole.

Conclusion

As presented in this literature review, there is much conceptual literature that discusses the context of environmental sustainability in higher education. Environmental sustainability is a complex concept that takes into account environmental, social, and economic concerns. Within the context of higher education settings, implementing green campus practices can be understood as occurring in the four areas of education, operations, research, and the external community. The process of implementing campus sustainability initiatives involves changes that occur within a particular culture that is unique to higher education. This process can be better understood when considered from

multiple perspectives such as the structural, human resource, political, and symbolic frames. The phenomenon of change in higher education has been described as slow and difficult. Nonetheless, environmental sustainability is an issue that college and university campuses are addressing in both theory and practice.

As an emerging field of inquiry, there is a need for more research in this area. Most of the studies located on this subject were conducted at single institutions, and their findings cannot necessarily be extended with great confidence beyond that site. Of the studies that involved more than one campus, the methodologies have been primarily qualitative. Although these qualitative studies may have a high level of transferability, none of them are comprehensive enough to cover the wide range of issues that must be addressed. Moreover, the quantitative studies that have been conducted in this area are focused on such narrow questions that it can be difficult to build a meaningful discussion that incorporates all of their disparate results. Furthermore, no longitudinal studies have been conducted in this area to understand particular trends over time. Thus, although the studies reviewed provide insight into the context, practice, and process of campus sustainability initiative implementation, there is still much to be learned.

Implementing a comprehensive environmental sustainability initiative on a university campus involves making a number of changes. Often the actions required, whether first- or second-order changes are made, entail that individuals change habits or routines that they have maintained for several years, sometimes several decades (Creighton, 1998; McKenzie-Mohr, 2011). Additionally, effective leadership across institutions of higher education is needed in order for the process of implementing campus sustainability initiatives to be successful. Stakeholders from students, staff, and

faculty all the way up to presidents and chancellors have a role to play in leading this process. Environmental sustainability initiatives are site-specific and must be understood on a case-by-case basis. This study strives to better understand the process of how environmental sustainability initiatives are implemented in higher education settings. By conducting a case study of a particular university, the research questions have been addressed within a bounded system. This focus has allowed for an in-depth analysis that moves beyond generalities and provides a detailed account of how a university implemented a comprehensive environmental sustainability initiative.

CHAPTER 3

METHODOLOGY

Introduction

The purpose of this case study was to examine how a university implemented a comprehensive environmental sustainability initiative. The primary research question driving this study was: *How does a university implement a comprehensive environmental sustainability initiative?* The primary research question was further explored through the following questions:

1. What strategies did the campus pursue in their efforts to implement a comprehensive environmental sustainability initiative?

2. What facilitates the adoption of a comprehensive environmental sustainability initiative?

3. What obstacles or challenges were faced throughout the process of implementing a comprehensive environmental sustainability initiative?

This chapter will articulate the methodology of this study, including the design, research site, data collection methods, and data collection procedures. Moreover, this chapter will cover the process of data analysis and the protection of participants. Lastly, I will describe the steps taken in this study to achieve trustworthiness.

Design

The methodological design of this research project was a case study. Creswell (2007) described a case study as a qualitative approach in which the researcher explores a bounded system (a case) over a period of time through detailed, in-depth data collection from a variety sources (e.g., interviews, observations, and document analysis), and reports a case description and case-based themes. I chose a case study design because it was the best fit in terms of its ability to make a detailed description of a particular case and its setting, in this case a single university campus.

One of the most significant reasons why a case study was the appropriate method for this study is due to the nature of my research question: How does a university implement a comprehensive environmental sustainability initiative? Yin (2009) described three main conditions to consider when selecting the appropriate method: (1) the type of research question; (2) the extent of control that a researcher has over the behavioral events being studied; and (3) whether or not there is a focus on contemporary events as opposed to historical events. In terms of this study, the form of the research question was a "how" question, there was no ability to control the behavioral events of the study, and there was a focus on both contemporary and historical events. Thus, according to guidance provided by Yin (2009), the conditions of the proposed study represented a good fit for the case study method.

Similarly, Kezar (2005) discussed a number of reasons why a case study approach should be utilized, including: (1) minimal previous research on the topic; (2) the focus on studying a process and reactions to it; (3) the focus on strategies and consequences; and (4) the emphasis on studying a specific context within a bounded system. This study also

fit Kezar's criteria, as there was minimal previous research on the implementation of environmental sustainability initiatives in higher education settings, the research question for this study focused largely on process as well as strategies, and the larger focus of this study consisted of understanding the context of a university setting within the bounded system of a particular university.

Research Site

Coastal Bluff University (CBU) is a private, faith-based university located in a major urban area on the west coast of the United States. The campus was founded in the early 1900s and occupies approximately 150 acres. The student population that CBU serves is comprised of approximately 5,000 undergraduate students and approximately 2,000 graduate students. The ethnicity of CBU students is approximately 55% White/Non-Hispanic, 20% Hispanic, 13% Asian/Pacific Islander, 8% African American, 1% American Indian/Alaska Native, and 3% Unknown/Decline to state. Approximately 50% of CBU students live on-campus in dormitories. Key components of the university's mission include the concepts of social justice, community service, and caring for others. CBU's mission also focused on educating the intellectual, emotional, and spiritual aspects of the individual. With respect to this study, the concept of environmental stewardship is implicit in the mission of CBU, making the research setting a particularly appropriate site to conduct this study.

Selection of the Case

This study was an instrumental case study, meaning that I focused on one issue or concern, and then selected one case to illustrate that issue (Creswell, 2007; Stake, 1995; Yin, 2009). This instrumental case study sought to understand how a university

implemented a comprehensive environmental sustainability initiative. The CBU campus was an ideal candidate for this case study because CBU had been committed to campus sustainability for approximately 20 years, beginning in the early1990s when it developed a model recycling program. Since then, CBU had been on the cutting-edge of environmental sustainability efforts in a number of ways, implementing initiatives in the areas of curriculum, facilities, and organizational planning. More recently, CBU had elevated its commitment to environmental sustainability in a variety of ways such as signing the American College and University Presidents Climate Commitment (ACUPCC), hiring a new Presidential Professor to develop an academic and co-curricular program focused on environmental sustainability, and hiring me as the first full-time CBU Sustainability Coordinator.

This study sought to understand the context, practice, and process of environmental sustainability initiative implementation in a higher education setting. The results of this study provide insight into how a particular university has implemented a comprehensive environmental sustainability initiative. By analyzing the efforts of CBU to this end, the results of this study may assist Coastal Bluff University by documenting this case study for current and future generations to utilize for continued program improvement. Additionally, this study has provided a set of findings and interpretations that may be transferable to other colleges and universities.

Participants

All of the participants of this study were CBU campus community members during the spring 2011 semester. The rationale for choosing participants was based on obtaining a diverse cross-section of the CBU campus community members as much as was feasible

for the given time and budget constraints of the study. Moreover, participants were chosen based on their level of interest and direct experience with implementing green campus initiatives at CBU during the time of data collection in the spring 2011 semester. As this study is focused on a comprehensive implementation process, it was critical to interview a diverse array of individuals from across the campus community. All participants were given pseudonyms to protect their identities.

Six of the participants were CBU administrators. It was important to interview a number of administrators because, in terms of structural authority and political power, they had great potential to influence the pace and intensity of green campus initiative implementation. The six administrators interviewed each had direct involvement in facilitating the adoption of green campus initiatives at CBU. Three other administrators were asked to participate in the interview, including the current and most recent CBU Presidents, as well as an administrator at the Associate Vice-President level, but all three of these individuals did not respond to my inquiries.

Four study participants were CBU faculty members. It was critical to interview CBU faculty members to gain an understanding of how sustainability was integrated into the curriculum. Moreover, many CBU faculty led green initiatives or otherwise supported them. Faculty members were chosen based on their level of interest in, and direct experience with, environmental sustainability in terms of curricular and co-curricular activities. One other faculty member was asked to participate in an interview, but that individual did not respond to my inquiries.

Two of the participants were CBU staff members. It was important to capture the perspectives of staff members directly responsible for managing the implementation of

green campus initiatives at CBU. As some of the closest individuals to the ground floor, CBU staff members were in many ways the most in touch with how green campus initiatives were implemented. One staff member declined to participate.

Five of the participants were CBU students. In addition to administrators, faculty, and staff, it was key to interview CBU students and hear their unique perspectives. All of the students interviewed were directly involved with implementing CBU green campus initiatives, and each of them integrated sustainability directly into their academic work in unique ways. No students declined to participate.

Data gathered from the demographic questionnaires are presented in Tables 1-4. Participant age ranges (Table 1) varied from young adults to senior citizens, with the majority being middle-aged. It was important to select participants from a wide range of age groups in order to account for generational differences in perspectives.

TABLE 1. Participant Age Ranges

18-24	25-40	41-56	57-72	73+
3	4	7	2	1

The breakdown of sexes among participants was seven females and 10 males, as reported by the participants in the demographic survey and listed in Table 2. It was important to capture both a male and female perspective for this study.

TABLE 2. Participants' Sexes

Female	Male
7	10

The racial breakdown of participants is displayed below in Table 3. It was important to interview individuals from varying racial backgrounds to account for varying perspectives that might tend to be unique to particular races. The racial profile of participants roughly mirrors the racial diversity of the campus as a whole.

It was important to choose participants with varying degrees of experience with the CBU campus in order to capture perspectives of individuals who have long histories with the institution, as well as those with moderate and minimal histories with the organization. This broad range of experiences with the university helped to provide a balanced pool of participants in terms of number of years with CBU, and corresponding

TABLE 3. Participants' Races

African American	Asian	Caucasian	Hispanic	Native American	Other
2	0	12	1	0	2 (1 Pacific Islander and 1 Mixed-Race)

impressions, biases, or other perceptions. With a relatively even sample of timeframes accounted for, the pool of participants spans a time period of over two decades with a diversity of organizational experience accrual represented. Table 4 provides the breakdown of participants based on how many years they were associated with CBU.

TABLE 4. Participants' Number of Years Associated with the Campus

0-2 yrs.	2-5 yrs.	5-10 yrs.	10-15 yrs.	15-20 yrs.	20+ yrs.
3	5	3	1	3	2

Data Collection Methods

A case study is a qualitative research design that uses multiple methods to investigate a contemporary phenomenon in depth and within a naturalistic setting (Creswell, 2007; Stake, 1995). Typically, case studies employ multiple methods to obtain data because no single source of information can be trusted to provide a comprehensive perspective (Patton, 2002). According to Creswell (2009), the four data collection methods that inform a qualitative study are document review, audio-visual material review, observations, and interviews. More specific to case studies, Yin (2009) listed six sources of evidence that inform a well-designed case study: documentation, archival records, interviews, direct observations, participant-observations, and physical artifacts. For the purposes of this study, the methods were divided into the three basic categories of interviews, observations, and document review.

Interviews

The interview sample for this study consisted of interview participants from the Coastal Bluff University (CBU) community. A sample of 22 individuals were invited to participate in an interview to discuss the research questions. Five of the individuals declined, leaving 17 CBU representatives who were interviewed. A purposeful sampling strategy was employed utilizing criterion sampling in order to obtain data from participants that directly informed the research questions from an insider's perspective (Creswell, 2007; Patton, 2002; Stake, 1995).

Participant selection. The criteria for selection in this study were high levels of expertise, interest, and direct experience with environmental sustainability initiative implementation at the CBU campus. I also selected participants that varied in terms of age, ethnicity, gender, and other personal characteristics in order to reflect the diversity of perspectives and experiences of the CBU community. For the purposes of this case study, these were the individuals who needed to be interviewed, as they were the people most engaged in the implementation of green campus initiatives at CBU. These individuals shared unique perspectives on issues pertaining to the process of implementing environmental sustainability initiatives within the context of the CBU campus.

Pre-interview demographic questionnaire. A hard copy, paper pre-interview demographic questionnaire was completed by participants immediately before the interview began to gather demographic information about each individual participant including age range, sex, race, campus role, and the number of years associated with the

campus (Appendix A). This data assisted me in collecting consistent, descriptive data on each participant.

Interview protocol. I developed an interview protocol for the purpose of interviewing participants for this study (Appendix B). Working with faculty mentors who have qualitative research expertise, the interview protocol was developed over the course of several weeks and multiple iterations of potential questions and orders of questions. In developing the questions, inspiration was found in the literature, including other qualitative studies. Once a draft of the interview protocol was developed, the interview protocol was pilot tested in the field with fellow doctoral students to determine how well it actually worked when put into practice. Slight adjustments were made to three of the questions in the interview protocol after field testing, and the final version was agreed upon by myself and my mentors.

The interview protocol guided the interviews and gathered data from the perspectives of the interviewees. As Yin (2009) suggested, case study interviews should be conducted as guided conversations rather than structured queries. Accordingly, I utilized a semi-structured interviewing technique with prepared lines of inquiry which allowed the respondents to address the facts of the matter as well as opinions, yet also allowed for a conversational elaboration on any topic addressed (Hatch, 2002). In using this focused interview method, I utilized carefully worded questions that allowed the respondents to provide rich, thick description (Creswell, 2007; Patton, 2002; Rallis & Rossman, 2003; Stake, 1995; Yin, 2009).

Observations

The observation component of this study consisted of observations made of key environmental sustainability program implementation efforts on campus. These observations were made throughout the spring 2011 semester, from January 10, 2011, through May 6, 2011. Field notes were taken before and after each observation to document what I saw and heard. Observations were made before, during, and after the interviews were conducted. I engaged in approximately 15 hours of formal observations for this study. Observations made included attending CBU environmental sustainability committee meetings (in which I was a participant), campus outreach events where there was an environmental sustainability table (such as CBU farmer's market events), other events where environmental sustainability was a theme, and other meetings where environmental sustainability was a topic of discussion.

I also conducted observations at campus work sites where environmental sustainability work was being performed, such as recycling, gardening, and grounds maintenance. Additionally, I observed a variety of campus offices to make observations of environmentally sustainable practices, or a lack thereof, in campus buildings, dining halls, and the library. Three building complexes in particular were observed due to the fact that they were certified green buildings through the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) program. Distinctive green features of the CBU campus were observed, such as rooftop solar photovoltaic (PV) arrays, reclaimed water infrastructure, and the CBU recycling facility. By engaging in these observations, I ascertained a snapshot understanding of how environmental sustainability was being implemented at the time that these observations are made.

Document Review

For the document review component for this study, I read and cataloged a wide range of documents pertaining to environmental sustainability initiative implementation at CBU. According to Yin (2009), "for case studies, the most important use for documents is to corroborate and augment evidence from other sources" (p. 102). For the purposes of this study, documents pertaining to the case were reviewed in order to build a detailed understanding of various dimensions of the case (Creswell, 2009).

The following list consists of ten distinct areas of focus for the document review analysis that was conducted for this study: (1) descriptions of the setting of the university site itself, (2) the role of environmental sustainability in university planning, (3) reference to environmental sustainability as it related to the mission or the culture of the university, (4) the mention of specific environmental sustainability implementation efforts, (5) the dissemination of environmental sustainability messages to campus constituents, (6) evaluation and/or assessment of the university's environmental sustainability initiatives, (7) notable accolades, certifications, and/or awards for environmental sustainability achievements, (8) specific environmental sustainability policies, (9) significant correspondence between key stakeholders regarding issues of environmental sustainability, and (10) membership in, or partnership with, external organizations focused on environmental sustainability.

Documents reviewed for this study included the Campus Master Plan and Environmental Impact Report, the CBU Climate Action Plan, pages on the CBU sustainability website as well as archived CBU Web pages with relevant information to this study, historical and current CBU environmental sustainability surveys completed,

CBU environmental sustainability videos, CBU brochures and fliers that included a mention of environmental sustainability in the form of outreach, the CBU Course Catalog and Schedule of Classes to identify courses on environmental sustainability in the curriculum, CBU Greenhouse Gas Inventory Reports submitted to the American College and University President's Climate Commitment (ACUPCC), and archived campus photographs containing evidence of environmental sustainability initiative implementation. Documents reviewed helped to triangulate data arising from observations and interviews (Yin, 2009).

Data Collection Procedures

As data was collected in support of this study, strict procedures were followed so that a high level of consistency was adhered to throughout the study. Rallis and Rossman (2003) discussed the value of what they referred to as the "techniques" of qualitative research, arguing that there is a need to pay close attention to the formal details of how data is collected. I obtained permission from CBU to conduct this study on the CBU campus. In addition, I obtained permission from the institutional review boards (IRBs) at both CBU and California State University, Long Beach. The description below provides the procedural details of the data collection techniques utilized in this study.

Interviews

As stated above, 17 key individuals were interviewed at CBU. These semi-structured interviews consisted of an approximately one-hour session of guided discussion based on the interview protocol (Appendix B). Interviewees were recruited via e-mail correspondence. An initial form e-mail (Appendix C) was sent to potential interviewees, asking them if they would be willing to participate in the interview. I

followed-up with e-mails and phone calls to confirm participation in the interviews, and schedule times and locations. During these follow-up e-mails and phone calls, I reiterated that their participation was purely voluntary, and that (in most cases) confidentiality would be maintained. There were three of the 17 participants who signed alternative informed consent forms (Appendix H) stating that their names would be kept confidential but their job titles would not. Due to the unique nature of their positions, as well as the nature of the questions asked in this study, these three individuals were not able to feasibly keep their job titles confidential. The other 14 participants signed informed consent forms that provided confidentiality for both names and job titles.

When scheduling the interviews, I requested that the interview be scheduled for a 1- to 1.5-hour time period to allow some flexibility in the interview structure, although I expected the interviews to last about 1 hour. Additionally, I confirmed that the participants would allow me to digitally record the audio of the interview. The participants' offices or private conference rooms were be used to conduct the interviews, whichever they preferred. Conference rooms on the CBU campus were utilized whenever requested by the interviewees to provide both a sense of privacy as well as a comfortable, familiar place to discuss the questions. Wherever the interviews took place, I attempted to limit distractions by closing doors. Prior to arriving at each interview, I tested my digital recorder to ensure that it was in good working order. I also brought an extra set of brand new batteries in case of potential battery failure, and double-checked that there was enough memory on the digital recorder to handle up to 2 hours of audio data.

During the actual interviews, I thanked participants for agreeing to be interviewed and presented them with a copy of the informed consent form for their review and signature. I reviewed the form with them to explain the process as well as solicit any questions. I also had participants complete paper hard copies of the demographic questionnaire (Appendix F) before the interview began. I kept the original consent forms and demographic questionnaires (placing them in envelopes that were immediately sealed), later storing them in a locked file cabinet at my home office.

In terms of asking the participants questions, I followed the Interview Protocol (see Appendix B) and began the formal interview process. For the most part, the interview questions were asked in exact order. However, in some cases questions were discussed out of order for the sake of keeping the discussion open-ended. At the end of the interview, I asked the participants if they had any questions for me. If they did, I answered the questions, if not, then the interview was concluded.

After the interviews, the digital audio files were copied onto my computer and backed-up on an external hard drive, both of which were password protected. Five of the interview transcriptions were conducted by a CSULB Graduate Student, and 12 were conducted by a professional transcription company, Lady of Letters, Inc. Each of the transcriptions was spot checked for accuracy and faithfulness to the audio recordings, accounting for approximately 20% of the total transcription data being spot checked. In all cases, I required that the data was stored in a secure manner. Transcriptionists used were required to destroy the original transcript files once the transcriptions were complete and I had successfully saved the information. Within 24 hours of the interviews, I took

field notes on my impressions of the participants' statements and non-verbal cues observed in the interviews.

Observations

I engaged in approximately 15 hours of formal observations that were directly relevant to this case. The observations I engaged in did not require special access to be granted because the activities were associated with the day-to-day duties of my job description such as attending environmental sustainability committee meetings and other campus events, as well as observing service work on campus such as landscaping, recycling, and dining services. In other words, these were all public meetings or spaces.

As a full-time staff member at CBU, I was able to indirectly observe much more than 15 hours of activities occurring at CBU. Prolonged engagement in the research setting allowed me to obtain an understanding of both externally observable behaviors and internal states of individuals such as opinions, worldviews, values, and attitudes (Patton, 2002). By taking hand-written field notes and then typing them up, I kept a running log of data for analysis that consisted of a description of my observations as well as notes containing my own personal reflections of the observed phenomena.

Documents

The documents collected for analysis in support of this case study were public information. As I collected documents for this study, I stored hard copies of these documents in file folders as archival records. I also maintained electronic copies of documents whenever feasible. All hard copy data was stored in a locked file cabinet and all electronic data was saved on my computer which was password protected. All of these document collection procedures were employed throughout the data collection

portion of this study. For the purposes of this study, the term "documents" included CBU website content, campus videos, and other forms of media beyond traditional paper documents.

Data Analysis

Data were obtained from interviews, observations, and document review, allowing for triangulation of data. Data analysis for each of these three collection strategies was conducted using an extensive process of coding (Creswell, 2007). Computer software (Atlas.ti) was utilized for assistance with data analysis. Using Atlas.ti, I kept track of my coding, notes, and other findings in a logical, systematic way. Field notes were reviewed to re-visit the significance of the observations. By reading and otherwise engaging in the documents reviewed for a prolonged time frame, I was able to attain a deep understanding of the significance of the documents reviewed. Likewise, by spending a prolonged amount of time reading the interview transcripts and listening to the interview audio files, I was able to reach a high level of familiarity which provided assurance that the data had been adequately analyzed for the purposes of the project. All data analysis was conducted as part of an on-going, iterative process.

Reflexivity

In qualitative research, reflexivity consists of a process in which the researcher partakes in an on-going exercise of self-questioning and self-understanding in order to examine what is known and what needs to be known about the data (Patton, 2002). Being reflexive requires an acute attentiveness to the cultural, linguistic, and ideological implications of the data itself, as well as an understanding of similar biases imposed on the data by the researchers involved with the data analysis of the study. The process of

reflexivity in qualitative research has been described as a hermeneutic circle in which the data is analyzed in terms of relating parts to wholes as well as wholes to parts (Patton, 2002). The term "hermeneutic" refers to the study and theory of interpretation (Rallis & Rossman, 2003).

For the data analysis portion of this study, I employed this hermeneutic circle. My data analysis process emphasized exploring individual parts of the data set in order to identify meanings in the whole data set, while at the same time making meaning of the whole data set which further illuminated my understanding of individual parts of the data set. By employing a reflexive practice, I moved from the development of codes and categories to the establishment of themes.

Coding the Data

Qualitative data analysis is an interpretive process. The process of coding begins at the moment that data collection is initiated. Throughout the data collection period, it is important for qualitative researchers to reflect on the data and what relationships may exist between data sets. However, there is a formal coding process that begins after all of the data are collected. After all data were collected in this study, the formal process of coding the data began.

As Saldana (2009) described, "a code in qualitative inquiry is most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data" (p. 3). Coding is an interpretive endeavor, not a precise science. After a thorough review of the individual pieces of specific data, abstractions were made of general concepts that embodied the

essence of a number of significant data points. Saldana describes the coding process as occurring in two distinct cycles:

> The First Cycle coding process can range in magnitude from a single word to a full sentence to an entire page of text to a stream of moving images. In Second Cycle coding processes, the portions coded can be the exact same units, longer passages of text, and even a reconfiguration of the codes themselves developed thus far. (p. 3)

The coding process that I engaged in was based on Saldana's two cycle approach.

First cycle coding. During the first coding cycle, I began by developing a priori codes based on my initial impressions of the case. My a priori codes were based on ideas found in the literature and my knowledge of environmental sustainability initiative implementation before the formal data analysis process started. After developing a priori codes, I began analyzing the data itself for codes. Throughout this process, I kept a running list of codes, working to consolidate and refine them as I read and reread interview transcripts, reflected on my observations and field notes, and studied the documents I had collected. Through a detailed, in-depth immersion into all of the data collected, I identified codes that emerged from the data as patterns of similarities between the documents reviewed, field notes from observations, and exemplars from interview transcriptions. I brainstormed a coding list, consolidated and refined codes, and created an electronic codebook using a data analysis software package (Atlas.ti).

The entire coding process was overseen by my Dissertation Committee Chair. He provided both mentoring for me in terms of how to best develop coding schemes as well as direct input on the development of the codes specific to this study. This process entailed frequent meetings, telephone discussions, and e-mail correspondence between my Dissertation Chair and myself. By giving me feedback and on my methods as well as

the nuances of my data, he provided me with a much more robust approach to coding. This professional oversight ultimately resulted in stronger codes than I might have developed without his assistance. For example, some of the concepts that I originally pulled out of the data as initial codes, such as "funding and budgeting," ended up changing due to the interactions between myself and my Dissertation Chair. This concept was broadened to include planning and prioritizing into a new code called "Planning, Funding and Prioritizing." After more collaborative analysis, these concepts were then disaggregated again and shifted into new codes, and eventually categories. Ultimately, the concepts of funding and budgeting were developed into a category called "Getting the Best Bang for their Buck," containing codes called "Doing their Homework," "Starting with Low-Hanging Fruit," and "Leveraging Financial Incentives." The interchanges between myself and my Dissertation Chair were invaluable in the development of the final codes, as well as the development of the categories and themes.

Second cycle coding. During the second coding cycle, I combined related codes into categories and sub-categories, which I eventually developed into themes. As Creswell (2007) stated, data analysis consists of forming raw data into codes and then combining the codes into categories in order to then form broader themes. The process of developing themes is similar to that of developing codes in that it is an iterative, reflexive process as well. From the many codes and categories initially developed arose a smaller number of themes, which more precisely embodied the essence of the most important and relevant aspects found in the raw data that culminated into broader meaning that informs the research question. As themes were developed, data were aggregated into several clusters based on which cluster it most pertained to (Creswell, 2007). As Saldana (2009)

stated, "The primary goal during second cycle coding, if needed, is to develop a sense of categorical, thematic, conceptual, and/or theoretical organization from your array of First Cycle codes" (p. 149).

During the second cycle coding process, I reorganized and reconfigured my first cycle codes into a smaller, more refined list of broader categories and themes. For example, one of the initial codes was the concept of "Top Down and Bottom Up" support for green campus initiatives. However, after many rounds of collaborative revisions with my Dissertation Chair, this concept emerged as a broader category rather than a single code, and was finally named "Building Consensus from the Top Down and the Bottom Up," which ultimately ended up under the even broader theme of "Planning, Administration, and Engagement." Throughout the process of developing codes, exemplars were identified and saved for future use as primary examples of why the code was selected. The Atlas.ti software was particularly useful in support of this effort.

Divergent themes and negative data were an integral part of the theme development process as well. Patton (2002) contends that cases which do not fit emergent patterns serve to enhance our understanding of identified patterns and trends. When reporting findings, it was important to consider the significance of negative cases in support of the interpretations and conclusions. For example, all of the participants interviewed described environmental sustainability initiatives as being of great importance to the university. However, the review of documents did not reveal such a strong interpretation of how CBU valued environmental sustainability as an institution. The concept of environmental sustainability was found in the CBU Master Plan, but there was no mention of it in the CBU Strategic Plan. Aside from CBU documents written specifically

about environmental sustainability, there were few mentions of it in the general literature about the university. Additionally, interview participants differed on whether or not CBU exhibited a strong or weak commitment to environmental sustainability (Kearins & Springett, 2003). These divergent themes, based on the question of how deeply CBU valued environmental sustainability, enriched the interpretive process of data analysis. Examples of these divergent themes are presented in Chapter 4 and Chapter 5 of this study.

Utilizing the Atlas.ti software as an organizing tool was an efficient way of facilitating the coding process. However, although the Atlas.ti software was of great assistance in the organization of the data as well as in indicating potential codes, the coding process was ultimately dependent on my diligence as a researcher as well as the expertise of my mentors and the peers in my community of practice. Throughout the coding process, I received assistance from a seasoned qualitative researcher, my Dissertation Chair, who has served as my primary mentor for this study.

Interpretation. As Patton (2002) discussed, interpretation involves imposing order on the data itself that is not otherwise apparent. Interpreting data consists of attaching significance to, drawing conclusions from, and making meaning out of a large assortment of individual datum. The hermeneutic circle involved with reflexive, iterative data analysis eventually resulted in the emergence of three themes that most directly related the data to the wider context of the case.

The following three themes were developed as a result of these coding and interpretive processes: (1) Greening of Worldviews, (2) Improving Green Campus Practices, and (3) Leading a University-Wide Effort. These three themes are explicated

in Chapter 4 of this study. Ultimately, the data analysis in support of this study developed into a description of CBU's implementation process that captures the phenomena that were observed, studied, or otherwise engaged with. This study sought to articulate a description of the context, practice, and process of how a university implemented a comprehensive sustainability initiative.

Protection of Participants

Potential risks in this project included compromising the reputation, psychological well-being, and/or comfort of the participants. I took all reasonable precautions so as not to cause harm, or risk of harm, to participants in this study. Some of the interview content was of a sensitive nature in terms of internal campus politics and other issues of concern. If identified, participants could potentially create conflict in their personal and/or professional lives by speaking in particular ways that could potentially offend other campus constituents. In order to address this risk, I worked to ensure that the identities of the interview participants are not revealed by requiring each participant to use a pseudonym. These pseudonyms were utilized for the purposes of the interview itself, for my field notes taken during the interview session, interview transcriptions, as well as for the final write-up of the findings of this study. Furthermore, I have strategically chosen not to provide information in quotes that could reveal a participant's identity. Only I know the identity of the participants, which I have kept on a list that is stored in my home office in a locked file cabinet. The interview transcriptions do not reveal the identity of the participants. These strategies have greatly assisted in keeping the identities of the participants unknown.

Although most of the interview participants were able to have their names and job titles remain confidential, there were three participants who were not able to keep their job titles confidential, specifically the Senior Vice President of Administration, the Vice President of Facilities, and the Presidential Professor in the Biology Department. These individuals were the only people who held these positions, and it was not possible to effectively hide their identities. Moreover, identifying them by position was important for giving key points or findings in the study context and depth. Thus, the informed consent process was different for these individuals. In order to participate in the study, they had to agree to not being completely confidential; their real names were not used, but their real job titles were used. These individuals had to sign an alternative informed consent form (Appendix H) that indicated their willingness to be transparent about their identities, and not remain completely confidential. The contributions of these individuals have added depth, texture, and credibility to this study.

Another potential risk to the participants of my study was that they could be made to feel uneasy or uncomfortable about some of the subject matter being discussed. It was possible that participants might have even become saddened or depressed during or after this interview. Some of the subject matter that the concept of environmental sustainability attempts to address (e.g., global warming, social inequity, human health issues, etc.) could have led to feelings of sadness or despair if explored in-depth. However, no harm to participants of this nature was observed. Throughout the study, all rules and regulations of the institutional review boards (IRBs) of each university were adhered to.

Trustworthiness

Throughout the course of this study, I took as many steps as was feasible to ensure the highest level of validity achievable. In terms of validation techniques, I employed a variety of strategies to ensure that a reasonable level of trustworthiness was met. Trustworthiness in qualitative research involves utilizing sound scientific methods as well as conducting research in an ethical manner (Rallis & Rossman, 2003). I strove to meet both of these criteria throughout the course of the study. In order to achieve a high level of trustworthiness throughout the course of this study, a number of techniques were employed.

Field notes were kept throughout the data collection period. My field notes contain descriptions of my observations in the main body, with my own personal opinions and thoughts about those observations written in the margins. By keeping what I observed separate from what I thought about the observations, I worked to maintain a high level of dependability in terms of teasing out my own personal biases from the data. All interviews were recorded electronically with an Olympus VN-8100PC Digital Voice Recorder to ensure that the recorded audio data was of high quality. I became adept at using the audio recording device before using it for the actual interviews to ensure that the unit promoted the clearest audio recording. The audio files were transcribed by a CSULB graduate student, and a reputable transcription service, Lady of Letters, Inc.

Triangulation

Triangulation involves utilizing multiple sources of data, multiple points in time, or a variety of methods to answer research questions (Rallis & Rossman, 2003). The strength of case study research as a method is its ability to triangulate data from multiple sources,

leading to a more accurate and convincing conclusion (Yin, 2009). Patton (2002) articulated four distinct types of triangulation: (1) Triangulation of data sources (data triangulation), (2) Triangulation among different evaluators (investigator triangulation), (3) Triangulation of perspectives to the same data set (theory triangulation), and (4) Triangulation of methods (methodological triangulation). Each of these distinct types of triangulation add to the overall trustworthiness of a study. For the purposes of this study, I primarily incorporated data triangulation, corroborating evidence from interviews, observations, and documents. This triangulation of data assisted in the process of developing themes, and ultimately added to the validity of this study (Creswell, 2009).

Prolonged Engagement

During the data collection phase of this study, I developed a deep understanding of the case by spending long periods of time with my interview participants as well as individuals that I observed. I also spent significant time making visual observations of campus features and collecting the documents that I reviewed. In qualitative research, this process is referred to as prolonged engagement (Creswell, 2009). Rallis and Rossman (2003) described prolonged engagement as spending time in the research setting and/or with research participants for an extended period to ensure that the researcher has gathered more than a snapshot view of the phenomenon. By serving as a full-time staff member at CBU in my role as the CBU Sustainability Coordinator beginning on February 1, 2010, my daily work duties revolved around the implementation of green campus initiatives. More specifically, the data collection period consisted of the entire spring 2011 semester which began on January 10, 2011, and ended on May 6, 2011. The deeper understanding that I gained from my prolonged engagement

with the study participants and research site has directly added to the validity of this study.

Positionality

As the researcher for this study, I have a unique relationship to the research setting, the participants, and the unit of analysis. The following description of my positionality in relation to this study is meant to clarify researcher bias from the outset of this study (Creswell, 2007). Before, during, and after the data collection period for this study, I have held a full-time staff position at Coastal Bluff University (CBU) as the Sustainability Coordinator. This position has entailed working directly to improve the implementation of environmental sustainability initiatives on campus. Clearly, I have had a direct influence on CBU's sustainability programs on an on-going basis. However, I only started this position recently, on February 1, 2010. Before this time, I had very little knowledge of the university, and specifically was not aware of CBU's environmental sustainability initiatives. Thus, although I have performed work that is significant and have implemented minor changes on campus, I personally have not had a far-reaching influence on the university to date. This was a good time for me to conduct this research project, in this respect, before my presence on campus might have led to more significant changes.

This case study assisted me in learning more about the campus in terms of its history, culture, and processes so that I was able to more effectively plan and implement changes and innovations regarding environmental sustainability initiatives. However, because this was an internal study, and the participants were almost certainly aware that other campus community members might read the published dissertation, participants may

have colored their responses to the interview questions. In order to be politically correct, participants may have sought to offer more positive responses, both because I was an employee of CBU, and also because others at the institution might read the study and attribute responses to the participants themselves. Specifically, participants may have responded in less critical ways due to my role as the sustainability coordinator. They may have told me what they thought I wanted to hear rather than how they really felt about the topics discussed.

Thus, while my employment at CBU provided an increased level of access and familiarity with the research site, it also may have restricted and constrained my ability to present an objective, unbiased description of the case due to both my own researcher bias as well as my personal sensitivities to the political realities of my professional position at CBU. Nonetheless, I worked as diligently as I could to separate my own bias and sensitivity from the research itself in an attempt to provide a description of the case that was as objective and fair as I could allow for given the unique conditions of my role as the researcher.

Personally, in terms of how I view environmental sustainability, I would describe myself as a pragmatic, progressive environmentalist. I believe environmental concerns are critical issues to address, however I think they need to be addressed in ways that will provide innovative solutions that are feasible and will contribute to environmental, economic, social, and human health concerns. With respect to how colleges and universities implement environmental sustainability initiatives, I believe that institutions of higher education are the ideal places for knowledge of sustainability to be developed and passed on through the processes of research, education, information dissemination,

and outreach. Moreover, I believe that colleges and universities ought to be transformed into models of sustainable communities. A college or university is akin to a small city, and can be viewed as a microcosm that reflects the wider macrocosm of society. By modeling what is possible on a relatively smaller scale, colleges and universities are uniquely positioned to demonstrate the dynamics involved with transforming from status quo communities to sustainable communities. As communities world-wide continue this transformation, colleges and universities continue to be on the cutting-edge of this movement. It seems to me that sustainability ought to be one of the central drivers in all campus decision-making processes, as well as one of the central drivers for decision making in the world at-large.

This research project has assisted me in developing a well-informed insider's understanding of how a university implements a comprehensive environmental sustainability initiative. This study has both assisted me in my efforts to improve the implementation of sustainability programs on-campus, and it may also help the university itself by documenting this case study for current and future generations to utilize for continued program improvement.

CHAPTER 4

FINDINGS

Introduction

This case study examined how a university implemented a comprehensive environmental sustainability initiative. The purpose of this study was to develop a detailed analysis of the process of implementing a comprehensive environmental sustainability initiative within a bounded system, in this case a particular university campus. Data from interviews, observations, and documents were analyzed, allowing for triangulation of data. The reflexive data analysis procedures of first-cycle and second-cycle coding resulted in distinct codes, categories, and themes that emerged from the data. The findings of this study are presented below, and consist of thematic interpretations that have been developed into a description that discusses how CBU implemented a comprehensive environmental sustainability initiative.

The process of implementing a comprehensive environmental sustainability initiative on a university campus is complex and consists of many incremental steps. Institutional change, particularly in a university setting, tends to be slow and difficult. Nonetheless, change does occur within a university setting, and the CBU campus has changed significantly over the course of approximately 20 years in an effort to go green. A close look at the case of CBU reveals an institution that has embraced some of the changes implicit in the greening of worldviews, which has allowed the institution to also take

steps to change some of their practices in this regard. However, these changes did not take place in a vacuum, and they did not occur overnight. The transition to green at CBU took place over a span of many years, and was the result of a concerted university-wide effort to incorporate the ideals and practices of environmental sustainability into the fabric of the organization.

Greening of Worldviews

At CBU there has been a momentum toward the greening of worldviews over the last two decades. The idea of greening worldviews implies that steps have been taken at CBU to influence the ways in which students and other campus community members think about environmental sustainability. As Paul, a faculty member said, environmental sustainability is "a worldview as well as a behavior." At CBU, formal education through academic degree programs played an important role in their efforts to green worldviews. Faculty also sought to infuse sustainability across the curriculum, so that students of all majors would have a chance to green their worldviews through academics. Moreover, CBU worked to engage students in relevant service work and community outreach activities to enhance the formal learning process in this area. This service work connected the university's mission and core values to the student experience. Additionally, CBU faculty and students greened worldviews through participation in research on topics that supported environmental sustainability both on- and off-campus, sometimes including CBU staff and administrators in the formal research process. The overarching goal was to encourage the CBU community to adopt environmental sustainability as a core value and a way of life. As a CBU student, Janine, said in an

official campus video published on the CBU website, "If you think green, you'll be green."

Expanding Academic Degree Programs

Part of the strategy to influence and shape worldviews at CBU was to develop and expand academic degree programs specifically related to environmental sustainability. Documents such as the CBU Course Catalog, the CBU Schedule of Classes, the CBU website, and other written descriptions of CBU's academic programs indicated that the campus offered degree programs that directly involved learning about environmental sustainability. For example, the campus offered an Environmental Science major as well as an Urban Studies major, each of which were heavily focused on environmental sustainability. CBU also offered a graduate program in Environmental Science at the master's level. A new Environmental Studies minor was implemented in fall 2010. Additionally, a brand new undergraduate major and graduate program in Urban Ecology was being designed and approved as of spring 2011, signifying a high-level commitment from the highest levels of the university to expand academic degree programs at CBU that are focused on environmental sustainability.

John, a faculty member, expressed his support for expanding academic degree programs involving environmental sustainability. John said,

> For me, as a university, even if you had a theoretically near perfect, closed loop kind of sustainability for the physical structures of the university, if you didn't also have the pedagogical mission where you're teaching that or the importance of it or the theory of it or rigorously questioning it, then somehow as a university, it wouldn't really be what I'd call an A+ if we were talking in terms of those (campus sustainability) report cards and things like that.

Paul, a faculty member, echoed John's statement when he said that, "Sustainability should be as much an academic engagement as it is a technical engagement." The new Environmental Studies minor and the emerging Urban Ecology undergraduate and graduate programs being developed at CBU represented a university-wide effort to expand academic degree programs focused on environmental sustainability. These programs were designed to provide students in these majors with a strong academic background in this area. However, interviewees indicated that the larger effort to green worldviews within the campus community needed to extend beyond the confines of particular academic degree programs. They felt that students needed to be able to learn formally about environmental sustainability in the classroom regardless of their individual majors.

Infusing Sustainability across the Curriculum

In addition to developing and expanding academic degree programs specifically focused on environmental sustainability, CBU sought to infuse concepts of environmental sustainability across the curriculum. These steps were premised on the notion that not every student will choose a major or a minor specifically focused on environmental sustainability, nor will every faculty member have the need or desire to specialize in environmental sustainability. At CBU, the issues involved with environmental sustainability were infused across many academic departments in the form of classes being offered and cross-listed between departments as well as through other means such as incorporating environmental sustainability into class projects or class discussions. Examples of courses that directly involved environmental sustainability included a World Religions and Ecology course offered by the Theology Department, an

Alternative Energy Systems course offered by the Engineering Department, and an Environmental Ethics course offered by the Philosophy Department.

Courses from across the CBU curriculum also focused on environmental sustainability as an issue of interest even if the course was not directly focused on the topic. One of the best examples observed occurred in a Political Science Research Methods course. In this course, the professor decided to have a theme for the class that would help to give the course a more tangible context. The theme for this course was hunger, and the students were encouraged to work on a CBU campus community garden project that was being developed by faculty, staff, and students at that time. Students in this course were able to take what they learned in class about research methods and apply that to a real-world project that their peers were involved with on campus.

Another example of infusing sustainability across the curriculum involved a number of faculty members bringing a guest speaker into their courses to talk about environmental sustainability. These faculty invited the CBU Sustainability Coordinator to give a guest lecture to their classes about CBU's campus sustainability initiatives. This guest presentation provided the students with a perspective within the context of those classes that they probably would not have otherwise had a chance to develop. For example, in a Business Administration course, the guest speaker talked about environmental sustainability within the context of the business world. Similarly, in a Thermal Systems Engineering course, the guest speaker used the nested model of sustainability as a visual tool to discuss the significance of clean energy technologies beyond the world of design, emphasizing that engineering projects have the potential to positively impact the economy, society, and the environment if all three of these

dimensions are considered when designing any sort of mechanical, electrical, or structural system. In both of these classes, students showed interest in the discussion and students asked questions.

Although several faculty members at CBU were interested in environmental sustainability, there was no campus-wide expectation that all faculty infuse these ideas into their work. Infusing sustainability across the curriculum appeared to be purely based on individual faculty desire to do so.

Interviewees noted that, although it may sound simple to infuse sustainability across the curriculum, it was more difficult than it sounded. For example, John, a faculty member, discussed the challenges of this in his interview, stating that, "there are a number of departments who are real foot-draggers on this and they don't see the importance of it . . . I've run into at least a couple of other departments for whom it's not even on their radar." Part of the challenge is that faculty may not have the interest in incorporating these issues into the research that they conduct or the classes that they teach. John agreed wholeheartedly with their right to this preference, stating that it is, "really hard to see how you'll change it because departments have, and they should have at a university, a large degree of autonomy for deciding what the need is." Nonetheless, John also believed that faculty from all disciplines should be concerned about environmental sustainability issues, and should at least be mentioning the significance of these issues in the courses that they teach.

Another challenge to infusing sustainability across the curriculum at CBU discussed had to do with the students. John talked about a disconnect that he had observed in the

classes he taught between what students thought of environmentalism as a topic and how they viewed themselves as individuals. John explained,

> So what I'll often say is, raise your hand if you're an environmentalist. Nobody will raise their hand. And I'll say, okay. Good. Raise your hand if you want clean water to drink. Every hand goes up. Raise your hand if you want clean air to breathe. Every hand goes up. Raise your hand if you're concerned now about radiation floating across the Pacific from the Fukushima site . . . Every hand would go up . . . So, I think we've got to talk to students about how environmental issues are pervasive.

As John's story illustrates, it is likely that many, if not most, CBU students cared significantly about environmental sustainability, even if they preferred not to be labeled as environmentalists. Ultimately, it was up to the CBU faculty to determine how to best emphasize these issues in the curriculum, as well as where to de-emphasize them.

Another way that CBU faculty worked to infuse sustainability across the curriculum involved promoting transdisciplinary and interdisciplinary collaboration around environmental sustainability. Paul, a faculty member, spoke in-depth about this topic in his interview, stating that, "Sustainability is in itself a not only interdisciplinary, meaning among programs within a college, but it's transdisciplinary, meaning reaching across the whole university." Paul continued his discussion of this topic, saying that, sustainability is "a transdisciplinary approach for training and creating vocational discernment for our students. And so, in order to do that, we have to think of all of the current boundaries within the university as porous." However, Paul was quick to point out that this would not necessarily be well received by the entire campus due to the department-centric nature of most academic institutions, including CBU, stating that, "some folks within the university are going to think that's a great idea and some folks won't." Nonetheless, Paul

was adamant that transdisciplinary and interdisciplinary approaches were key to the success of infusing sustainability across the curriculum.

In his interview, Paul discussed the inherent challenges of transdisciplinary approaches to education, stating that, transdisciplinary education "is going to be about striking a balance between breadth and depth. And we can in some ways get around that problem by teaching towards problem solving as opposed to the idea of discipline based knowledge." Paul went on to give an example of this, explaining that,

> If you're going to create a healthy wetland system, depending on what part of the project you're going to work on, you're going to need a very healthy understanding of biological systems. You're going to need to understand chemistry. But you're going to need to understand economics. You're going to need to understand psychology. You're going to need to understand the philosophy and ethics around conservation management. We've got to be able to strike that balance, and [transdisciplinary] centers are in a position to do that because they're not beholding or committed to only one department.

Thus, as Paul discussed, at CBU it was important to work toward the development of a transdisciplinary center to achieve the level of faculty collaboration necessary to approach the complexities of sustainability from the multiple perspectives needed to adequately address these inherently multi-faceted issues.

In addition to expanding environmental sustainability academic degree programs and infusing sustainability across the curriculum, at CBU it was also important to move beyond the classroom and offer students opportunities to participate in service work and outreach activities focused on issues of environmental sustainability.

Learning through Service Work and Community Outreach

A major component of CBU's mission as a university was to provide service to others in the community. One of the most prominent aspects of this mission-based

component at the institution overall was to integrate service into the students' learning experiences. At CBU, students were provided with a number of opportunities for this, including formal service learning programs and less formal service projects. These formal service learning opportunities were coordinated between academic departments and an on-campus center for service learning where full-time staff helped faculty to integrate service learning components into their classes. Additionally, CBU students were engaged in a variety of other service projects through clubs, Greek life, campus ministry programs, and specific CBU service organizations. In particular, CBU worked to tie environmental sustainability to the campus mission by finding ways to engage students in sustainability-focused service activities.

Within the context of campus sustainability initiative implementation at CBU, students participated in service in a variety of ways. A faculty member, John, expressed his support for integrating service in this context:

> I would like to see the pedagogical mission of the university interface with what's called service learning or community-based learning so the students are actually doing hands-dirty kind of work whether that's environmental justice or environmental restoration or something else like that. I think we should continue to push that.

John integrated service learning into his own classes. In a meeting with John and a graduate student assistant, John was observed describing the work that he had done in the past in this regard, as well as brainstorming with the graduate student about ways in which they might involve future students in the emerging urban gardening initiative at CBU. Many ideas were discussed including having students work in the community garden as well as deliver fruit and vegetable harvests to local food pantries.

As an interesting juxtaposition to John's comment noted above, he also noted that there must be limits to how deeply service learning is integrated into academics. Although John was supportive of service learning, and was actively engaged in integrating it into his courses, in his interview for this study John was careful in his emphasis of service learning, explaining that, "We don't ever want that to overtake the intellectual mission of the university because our university is not the Peace Corps." John elaborated on this point further, stating that,

> Because this is a four year liberal arts institution, the core mission should be the student's intellectual life and getting them to think about these things clearly, get them to think critically and independently and clearly, and be able to communicate that cogently. That should be the core mission. But I think, especially with environmental studies, it's almost impossible to do that without some hands-on experience too to reflect on. We want to focus on the academics but I think we should incorporate even more service learning than we do on that.

In addition to formal service learning opportunities through the academic departments, Henry, a faculty member, talked about how much he appreciated the student internship program that the Facilities department was leading. In this program, students were hired specifically to assist with campus sustainability initiative implementation such as recycling on campus, which in many respects was considered to be community service work. When asked how CBU might improve their efforts to green the campus, Henry replied that, "as much as possible try to get student-faculty involvement and other staff involvement somehow so that it becomes part of an education, too, and community service within the university community. That's good because now it makes it more real."

By linking the service work that CBU students participated in with CBU staff to the academic work that the students participated in with CBU faculty, Henry thought that the

student experience would be enhanced. One example of this observed at CBU consisted of a project advised by Henry and conducted by a senior environmental science major, Taylor. She connected her academics to service work by deciding to focus her senior environmental science project on a food waste diversion study that was also part of her job as an intern in the CBU Facilities department. Taylor studied the process of diverting food waste generated at the CBU dining commons from the waste stream in order to compost that food waste on the CBU campus and convert it into a natural soil amendment. By merging her desire to provide a community service to the campus as well as study the science of composting, Taylor was able to get the best from both worlds and enhance her learning experience by grounding it in real-world experience.

Another observation of the merging of service work and academics at CBU consisted of an event to plant a native, pollinator-attracting garden as a part of the University President's Week of Service. A group of approximately 20 CBU students from the newly formed CBU Garden Club were excited about this project, and many of them integrated this service work into class projects. The students dug up a small patch of soil and removed weeds and some non-native ornamental plants that had been growing in the space, and replanted the area with native flowering plants that were intentionally planted to attract bees, butterflies, hummingbirds, and other pollinators.

This event reflected a high level of student enthusiasm for implementing sustainability initiatives not common in observations of other projects. The project embodied what this group of approximately 20 CBU students seemed to be looking for: a service project focused on a campus sustainability initiative that provided tangible results which the students could identify with personally and connect to their academics.

Several of these students mentioned that they had written essays about this project and its premise as a part of their formal course work. One student captured video footage of this event and created a YouTube video for one of his classes signifying how meaningful the project was to the students who were involved.

In addition to providing formal education and service work, CBU also provided informal education focused on raising awareness through community outreach efforts that typically existed outside of the traditional academic sphere. As a complement to what was learned in traditional academic settings, CBU students were able to learn about, and participate in, campus sustainability initiatives through a variety of co-curricular and extra-curricular activities including outreach events, film screenings, and club activities. Many of these activities were organized to raise awareness about sustainability issues in ways that traditional academic programs typically did not focus on.

The most notable environmental sustainability outreach program observed at CBU was the on-campus farmer's market event that was a primarily student-led initiative. According to an issue of the CBU green campus newsletter published in fall 2010, the farmer's markets at CBU began during the 2006-2007 academic year. This bi-weekly event occurred every other Thursday throughout the semester during a mid-day break when no classes were held. The CBU farmer's market took place in the central quad of campus where students tended to already congregate during these time slots. Local farmers were invited to the CBU campus to set-up a booth and sell their produce to the campus community. Other local community vendors were also invited to participate including artists, activists, and prepared food providers.

The farmer's market events were a place where CBU students knew that they could meet up and participate in a number of activities that would inform them about environmental sustainability issues as well as other important concerns. One of the students, Janine, who was integral in managing the farmer's market initiative shared her perspective that, "the importance of having a farmer's market on campus is that it develops lifestyle habits for students so that they'd be more inclined to go to farmer's markets in their own hometowns once they have their own homes after college." Another student, Taylor, also discussed the significance of CBU's farmer's market initiative, stating, "things like the farmer's market are really good because they kind of, they're in your face. I mean, you're walking through the farmer's market, you're getting a real-life experience of what this is, what a farmer's market is."

Conducting research for sustainability. Another key method for greening worldviews at CBU had to do with conducting formal research projects at the university. Although this research was not discussed in-depth during the interviews, observations and documents indicate that CBU faculty from across the university were engaged in a variety of research projects focused on environmental sustainability. For example, CBU had been engaged in wetland restoration projects in association with other community organizations that were interested in restoring the wetland systems located immediately adjacent to the university. Other examples of research projects at CBU focused on environmental sustainability that were found in the review of documents included research on climate change conducted by faculty in the Civil Engineering department, research on fuel-efficient vehicles conducted by faculty in the Mechanical Engineering department, environmental ethics research conducted by faculty in the Philosophy

department, and research on corporate sustainability conducted by faculty in the Business department.

In addition to the academic research projects that had occurred at CBU, the university was also engaged in research projects where faculty and students worked directly with CBU administrators and staff to implement campus sustainability initiatives. For example, a CBU news article found in the digital archives of the CBU website discussed the CBU reclaimed water project. This article described the partnership between CBU's Civil Engineering department and CBU's Facilities department in an effort to eliminate the odor emanating from the reclaimed water used to irrigate CBU's campus grounds. By developing an innovative, collaborative research project around this problem, CBU demonstrated how a campus can harness the power of faculty and student research to solve real-world problems utilizing the campus as a research site.

Other projects found in the documents indicated CBU faculty and students collaborated with CBU staff to conduct research in support of on-campus environmental sustainability initiatives included topics such as solid waste management, solar photovoltaic energy systems, and storm water management. A CBU student, Janine, discussed the significance of conducting research for environmental sustainability at CBU in her interview, stating that, "one strategy that really works well on a college campus is getting the students and the professors involved." Janine went on to explain that, when the campus is looking to improve its environmental sustainability practices, "having students do the research and getting professors excited about it so that they can get their students excited about it and possibly assign it as part of the class; I think that's really successful."

Steve, a CBU staff member, also expressed his support of this type of collaboration on research for campus sustainability. He discussed this from a staff perspective, explaining that the staff role had consisted of contributing "to environmentalism, sustainability, and stewardship in a tangible way; not just as a cheerleaders but as scientists actually doing some of the primary research." By building these collaborative research teams consisting of faculty, students, and staff, CBU was able to provide opportunities for the greening of worldviews to occur through participation in formal research projects that benefited both the individuals involved in the research as well as the campus as a whole.

As discussed above, the greening of worldviews at CBU took place in a number of ways, most notably through formal academic programs, infusing sustainability across the curriculum, learning through service work and community outreach, and research for sustainability. All of these activities provided students and other CBU community members with a spectrum of unique ways to learn about environmental sustainability, and challenge some of the biases and assumptions that underlie individual worldviews. Through exposure to new ways of thinking, CBU campus community members were encouraged to consider the pervasive nature of environmental sustainability issues and work toward addressing these concerns in thought and action. This learning process has been referred to as the greening of worldviews, but making changes in worldviews was only the first step. As an institution, CBU promoted the greening of worldviews, but it did not stop there. CBU put theory into practice by implementing a comprehensive environmental sustainability initiative that permeated not only academics, but the physical development of the campus and various administrative processes as well.

Improving Green Campus Practices

Over the past two decades, CBU has engaged in an on-going effort to work toward improving green campus practices. A historical analysis of CBU's campus sustainability efforts indicates that when CBU decided to implement a new university-wide sustainability initiative, they liked to go big. Beginning in the early 1990s, CBU implemented one of the first comprehensive campus recycling programs in the region. Building on the success of this program, in the early to mid-2000s CBU expanded its campus sustainability efforts by implementing two other large initiatives: using solar photovoltaic (PV) systems for generating electricity and using reclaimed water for irrigation. These three notable initiatives (recycling, solar power, and reclaimed irrigation water) were described by many of the interviewees as being the most significant campus sustainability initiatives at CBU. More recently, in the mid- to late-2000s and early 2010s, CBU has focused on addressing the issues of climate change, green building, and alternative transportation.

Reducing Waste

CBU maintained one of the longest-standing university recycling programs in the United States. Beginning in the early 1990s, when recycling was just beginning to be implemented in municipalities and large institutions like universities, CBU was on the cutting-edge of researching and developing recycling programs within the context of a university campus. The primary materials recycled at CBU included cardboard, paper, and beverage containers. Other materials recycled include electronic waste, printer cartridges, and fluorescent light bulbs. The unique nature of this program was described

by Steve, a staff member who had worked at CBU when the recycling program first started. Steve explained that,

> We were the first [higher education] institution, really, I think, in North America, if not the world, to have a campus-wide recycling program. And one of the messages of that program was you can't afford not to recycle. And we shared those results with people who maybe were having a different experience, maybe were looking at it as a regulatory hurdle that they had to throw money at to bring them into compliance, because that's the model they had for regulatory compliance. No, we were sending a different message. No, you can take responsibility for your environmental issues and actually mitigate them for less cost than if you just ignored them. That was the overarching message of the recycling program.

As an innovator among universities across the nation with respect to recycling, CBU developed a program that demonstrated how a campus recycling program could be both cost-effective and environmentally responsible. The CBU recycling program was partially driven by a state law which mandated that local municipalities plan and implement recycling programs. As Steve mentioned, some of the parties affected by this legal mandate simply viewed it as a regulatory hurdle that had to be overcome, and were happy to spend money on having outside vendors haul mixed materials offsite instead of finding a way to make the program cost-effective. However, other parties, such as CBU, considered themselves to be more forward-thinking and took the legal mandate as a challenge to make recycling a viable practice in terms of both economics and environmental responsibility.

CBU was recognized for its leadership in collegiate recycling in a number of ways. A review of documents revealed that the campus had received multiple awards for their waste reduction and recycling efforts. Most recently, in 2009 and 2011, CBU participated in a nation-wide collegiate recycling competition called "RecycleMania," in which hundreds of campuses competed over a 10-week period to find out who could

recycle the most. In both 2009 and 2011, CBU placed in the top 15 of the "Grand Champion" category, indicating that CBU ranked among some of the most successful recycling programs in the nation.

In terms of CBU's waste diversion rate, consistent records were not available during the time of this study. However, according to the 2011 College Sustainability Report Card, in which CBU earned an overall grade of "B+," CBU's diversion rate was 56% (Sustainable Endowments institute, 2011). Additional diversion rate data was listed on the web site for RecycleMania, a nation-wide collegiate recycling competition, for a series of 10 weeks. The average diversion rate from those 10 weeks was 65% (RecycleMania, 2011).

The most unique aspect of CBU's recycling program compared to other universities was that CBU invested campus funds into the purchasing of industrial equipment that allowed recyclable materials to be collected, transported, and sorted *on-site* and then consolidated into forms that could be sold on the commodities market, such as cardboard and paper bales. Another staff member, Damien, spoke about the significance of CBU's recycling efforts as well, stating,

> The fact that we do sort our solid waste before shipping it out, unlike a number of universities who simply just take it, haul it off and have no idea what their diversion rate is at all. We're at least able to send out a relatively pure product whether its paper, plastic or glass. I think that's really significant.

Damien was contrasting the proactive nature of CBU's efforts to ensure that solid waste was separated with the more passive, less aggressive efforts of other universities. This sentiment was echoed by a student, Denise, when she said that, "our recycling program, having that facility on-site, is a huge thing that sets us apart from every other university.

I hear people make reference to that all the time." Observations of the on-campus recycling facility revealed a substantial work crew of approximately seven full-time professional staff and seven part-time student staff who worked together and used customized vehicles to collect, transport, sort, and consolidate recyclable materials on campus.

One of the reasons that recycling has been one of the most successful campus sustainability initiatives at CBU is that there were significant financial incentives gained by recycling waste rather than sending it to landfills or waste-to-energy facilities. The financial benefits of recycling were described succinctly by CBU staff member Steve, when he stated that,

> In recycling, there's two sources of revenue. There's avoided disposal expenditures, these are real monies we once paid that we no longer pay because of recycling, and those monies far exceed anything we make on the rebate end. But then there's also the sale of recovered material.

By sorting recyclables on-site and consolidating various recyclable materials into quantifiable commodities, CBU demonstrated that a university campus can avoid disposal and hauling fees, as well as generate income for the campus from the sale of these recyclable material commodities.

Recycling program challenges. Although CBU demonstrated leadership in the area of waste reduction and recycling, some of the interviewees described ways in which the CBU recycling program could be improved. For example, when asked whether or not she thought that CBU was a green campus, Marie, a CBU student, answered by saying that, "I think the campus is striving to become green. I think it has a little ways to go. I think the recycling program needs to grow to encompass the entire campus, such as the

classrooms." Henry, a faculty member, also described some frustrations he had experienced that had to do with the availability of indoor recycling bins,

> I haven't really noticed a lot of recycling bins in the library. In fact, one of the main rooms up there where a lot of people like to meet, I've been in several meetings now, there's no recycle bin in there yet everybody's chucking their plastics in the trash. I pull them out and put them on a table, they'll probably just sweep them back in the trash as soon as I leave . . . . So, that is just physically getting more recycle bins in there and I know that that means that now you've got to visit those bins to empty them. That means expanding recycling services. There's a domino effect. I get it. So, the university should look to how can we increase that. Does it mean, more student workers, which means more money in the pool for student workers? But that should be considered, all these aspects.

Other interviewees expressed similar frustrations with the lack of recycling bins in indoor locations. For example, Taylor, a CBU student discussed the lack of recycling bins in the on-campus dorms,

> When I was a freshman, I was so annoyed that we didn't have recycling bins in our dorms and then I asked my RA and she said you have to call and request one from facilities. So I called and it took like a month and a half to get it. So, I was so annoyed . . . I was just one student who thought to ask. Like, no one ever told me you could do that. So, for all those students who don't even know you can ask, they just live without recycling bins. So, the recycling bins is the one thing that I would love to see, just mandatory recycling bins in everyone's room. I think that would be so great and, I think it's ridiculous we don't have them.

Observations of meetings between staff members in the housing and recycling departments indicated that a brand new dorm recycling program was being planned and initiated for the fall 2011 semester, and that this initiative was largely driven by student demand. These meetings were observed toward the end of the spring 2011 semester, after Taylor was interviewed for this study.

Cathy, a staff member, discussed her perceptions of how students participate in recycling programs, emphasizing that it was important to make recycling convenient,

> I think that our students want to be as green and sustainable as possible with as little effort as possible going into it . . . So, if you put a recycling bin next to a trash can, I do believe our students would put their plastic bottle in a recycling bin because they do think they want to be green and environmentally conscious and sustainable. But when it comes to the next step whether or not it impacts their life in a potentially negative way, I don't know that they are there. I think that there is a group who would go through the steps to do what is needed to create a more sustainable lifestyle for themselves but I don't know that as a whole our campus, the rest of the campus, would . . . but I do think that, overall, they want to be sustainable, as long as it doesn't actually impact their lives in a negative way.

Cathy followed-up on this line of conversation later in her interview. When asked what she would like to see on campus in terms of improving environmental sustainability initiatives, she responded by stating that,

> I think we need more recycling bins in visible areas. We are a campus that is very thoughtful of the appearance of the campus and I think that there are some who believe that recycling bins are not attractive and that they do not fit in that vision. I know that there are attractive recycling bins that are out there and are available for outside use . . . there are probably logistical issues when looking at large scale recycling, attractive bins versus the large, blue rolley bins that seem to be put out all over the place and I understand that those are not attractive. But I think the university needs to make a much better effort to get recycling bins in public places so that anybody anywhere who needs to throw away a water bottle has a place to throw away a water bottle.

Observations on the CBU campus revealed that new, attractive recycling bins had been placed strategically on-campus toward the end of the spring 2011 semester, after Cathy was interviewed for this study. These new, attractive recycling bins were cabinet-style boxes made from recycled milk jugs. Each unit consisted of a three-bin system for collecting beverage containers, paper, and trash. Complete with school colors and personalized CBU branding, these new recycling bins were far more attractive and user-friendly than the old "Toter" rolley-carts that the campus had nearly used to the end of the product's usable life. In the case of recycling on the CBU campus, it was important to have attractive recycling bins both for maintaining the image of the campus as well as

for increasing waste diversion. Triangulation of data shows that CBU was actively responding to the concerns of some of the campus community members with respect to increasing the availability of recycling bins on campus.

Overall, although some interviewees expressed specific frustrations with the CBU recycling program, there seemed to be much more positive support for CBU's recycling efforts than negative criticism. Some of the interviewees expressed concerns about the lack of recycling bins in areas such as classrooms, dormitories, and common areas. Observations indicated that the university was taking steps to meet the demands of the campus community, indicating a commitment to improving the recycling program. Even though improvements could be made, such as those discussed above by interviewees, the general consensus appeared to be a strong appreciation for the leadership that CBU displayed in the areas of waste reduction and recycling. The CBU recycling program was the campus' first sustainability initiative that demonstrated the ability to save money and benefit the environment. Building on the success of the recycling program, CBU branched out into other green campus initiatives.

Generating Renewable Energy

Building on the success of their campus recycling program, in the early to mid-2000s, CBU expanded its campus sustainability initiatives to include the generation of on-site renewable energy. By installing three major solar photovoltaic (PV) systems on three separate buildings on campus, CBU demonstrated a major commitment to reducing the campus' impact on the environment. According to an archived CBU press-release, in early 2003 CBU installed what was referred to as the largest solar electric rooftop system of any university in the world at that time. The PV system consisted of an approximately

700-kilowatt (kW) hours peak solar rooftop system, generating enough electricity on average to account for approximately 6% of the campus' total electricity needs.

The university's investment in this large PV system propelled CBU to a place of leadership among colleges and universities. According to data published by the Association for the Advancement of Sustainability in Higher Education (AASHE), many other universities have since installed much larger solar PV systems on their campuses. At the time of data collection for this study, the AASHE website reported Princeton University as the university with the largest solar PV system, consisting of 5,300 kW. Over the last decade, there has been much growth in generating on-site renewable energy on college and university campuses. CBU was an early adopter of generating renewable energy on a large scale, much like CBU was an early leader in the recycling arena.

Although CBU can no longer claim to have the largest solar PV arrays of any campus, CBU nonetheless persists as a national leader in this respect. Frank, a CBU administrator, summarized this in his interview when he explained that, "We have a commitment to renewable energy. We were one of the first universities to install a photovoltaic system. At the time, it was the largest system of any university in the country." The CBU solar initiative was also commented on by John, a faculty member. When asked about the green features of CBU that he thought were significant, he stated that, "the thing that always gets touted publicly is the solar panels. And that's sort of, something we should tout. It's a large array relative to what other campuses have."

Many of the students interviewed also discussed the CBU solar initiative. Marie, a CBU graduate student, expressed excitement about CBU's solar initiative, saying that, "I think it's great that there's solar panels and that part of the university is powered off

them." Roy, a senior environmental science major, also discussed the solar initiative. When asked what he thought were the most significant green features of the university, Roy responded, "the solar power, because of the growing fuel prices and the strain that petroleum and fossil fuels have put on the environment." Roy followed-up on this comment later in the interview when he was asked about how the university might best invest its financial resources in green campus initiatives. Roy answered this question by saying that CBU ought to "invest in the highest efficiency solar panels, start generating solar power, and hopefully sometime in the future you'll have enough to where you can start selling it back into the grid."

Although CBU was far from being able to generate more energy than it consumed when this study was conducted, CBU was nevertheless recognized for its major achievements in this area. The review of documents revealed that CBU had received a number of notable awards for its leadership in renewable energy systems and energy efficiency, including a federal award from the U.S. Environmental Protection Agency.

Steve, a CBU staff member, discussed the financial piece of this project in his interview, stating that, "With solar, you've got some real cost savings there, energy that we would be buying off the grid that we're now contributing to the grid and enjoying a rebate or a rate reduction." One of the most significant features of CBU's 2003 solar PV installation was the generous financial incentive package that the university leveraged to dramatically offset the up-front costs to CBU. The project participated in a state incentive program that provided substantial rebates. Of the total project cost of approximately $4.3 million, the local municipal electric and water utility agency provided $3.7 million and the local gas company provided approximately $300,000, leaving only

approximately $300,000 for CBU to pay for out-of-pocket. This project represented a very high return on investment (ROI) for CBU, and was likely much easier than average to get top-level support for, due to the large financial incentive. However, even with the rebates, this initiative represented a serious financial commitment to campus sustainability because PV systems require on-going maintenance, including frequent cleaning. Additionally, by making the financial commitment to purchase and maintain these three large solar arrays, CBU was also making a commitment to improve the environment by generating renewable energy, thereby relying less on polluting fossil fuels.

Irrigating with Reclaimed Water

In addition to the recycling program and the solar initiative, CBU has shown campus sustainability leadership in their efforts to irrigate campus landscaping with reclaimed water, also sometimes referred to as "recycled water." This initiative conserves potable water, meaning water that is approved for drinking, cooking with, washing with, and bathing in. The reclaimed water used by CBU was provided by the local municipal water utility. Reclaimed water comes from wastewater treatment plants, and consists of water that has been treated in a variety of ways to clean the water to a safe standard. Although reclaimed water use has increased in the United States in general over the last couple of decades, its use is still considered innovative because it is not yet available everywhere and its use has not become a cultural norm. In many ways, CBU has been a leader in the use of reclaimed water for irrigation, particularly in the higher education sector. By spring 2011, CBU had achieved a build-out of approximately 75% of its landscaping

being irrigated by reclaimed water and had plans to reach 100% sometime in the not-too-distant future.

The review of documents indicates that CBU won awards for its reclaimed irrigation water initiative, including recognition for the WateReuse© Association. One of the CBU administrators, Frank, commented on this initiative, stating, "I think we do an excellent job in using recycled water to irrigate the campus. We've got about three-quarters of the campus being irrigated with recycled water right now, so that's made us a recognized leader there."

This program was also mentioned by Steve, a staff member, when he talked about how CBU was able to implement effective campus sustainability initiatives that showed real cost-savings in addition to environmental benefits. Steve described how CBU demonstrated that a university can:

> use something other than potable water that has the highest premium of any type of water source, and you can use this for irrigation. You can maintain the quality of your campus or your setting. And, in fact, we've climbed into the top ten most beautiful campuses in North America, according to the Princeton Review. All that happened during the reclaimed water era, so we know that that's a very viable, very good program.

Observations conducted across the CBU campus during the spring 2011 semester revealed the placement of several small metal signs, approximately 1' x 2' in size, stating that, "In an effort to conserve drinking water, we are using recycled water for irrigation." These signs were posted into the ground near purple pipes and sprinklers (indicating the use of reclaimed water), as well as other points around the campus grounds where people could see evidence of the reclaimed water program in action. The signs both educated

the community about the project and indicated that these particular water sources were not potable.

Much like the recycling program and the solar initiative, the CBU students interviewed knew about the reclaimed water initiative and expressed excitement about it. This was addressed specifically by junior environmental studies major, Janine, in her interview when she stated that, "The use of reclaimed water on campus is the most brag-worthy accomplishment considering that we've won awards for it." The high usage of reclaimed water by CBU prevented the use of millions of gallons of potable water annually while also providing the university with substantial cost-savings since reclaimed water costs significantly less than potable water.

Although financial data was not available for use in this study, a PowerPoint© presentation created by the CBU Facilities Department noted that the use of reclaimed water for irrigation at CBU had increased from approximately 44,000 hundred cubic feet (hcf) in fiscal year 2008 to approximately 60,000 hcf in fiscal year 2010. Accordingly, the same presentation data indicated that reclaimed water use accounted for approximately 68% of the total irrigation water used at CBU in fiscal year 2008. This number increased to approximately 91% in fiscal year 2010, demonstrating an upward trend in reclaimed water use for irrigation at CBU. Along with the recycling and solar initiatives, the reclaimed irrigation water initiative represented both environmental and economic benefits.

Reducing lawns and increasing native plants. Even though there was much support for the reclaimed irrigation water initiative at CBU, some interviewees expressed dissatisfaction with elements of the campus grounds. Most notably, interviewees

expressed that CBU should have less lawns. Likewise, interviewees argued that native plant communities should be restored in as many areas as would be feasible. For example, when asked how CBU might improve its environmental sustainability initiatives, Janine, a CBU student, answered by saying that "there's definitely more to improve, of course, . . . I don't know if the university would go for this, but getting rid of lawns that waste so much water for them to keep looking nice." Instead of having lawns take up the majority of the green space on campus, interviewees discussed alternative ideas. Denise, a CBU student, offered suggestions,

> I would love to see all different types of gardens all over this campus that kind of showcase all the different aspects of sustainability. For instance, part of, one part of our garden is going to be rainwater garden. A group on campus that expressed interest in possibly creating a little native greenhouse type of place, whatever, I'd love to see an art garden because there's not very much student art on this campus. I'd love to see a medicinal garden. There's just, there's so many different ways I see gardens as being able to teach that I just see them as much more useful than that lawn.

George, a faculty member, expressed a similar idea to Denise. When asked how CBU might balance aesthetic beauty and sustainability with respect to campus grounds, she explained that,

> I think that what I would do is go to the various native plant people or send people there if it was in somebody's budget to do so, and get [the campus grounds staff] to learn how to make the more beautiful gardens doing that. So, in other words, not necessarily take away the lawns and that kind of thing, but have areas that encroach that really do have that element and aesthetic to them that teaches us. It's also part of a teaching tool about where we're placed, what would perhaps be sustainable ways of doing it. We do have elements on campus, for example, where there are oak trees. And they're quite gorgeous and beautiful, and one can probably further those areas and make patches that are reasonable.

Henry, a faculty member, also discussed the significance of increasing native plant communities on campus. When asked what CBU could do to increase sustainability in

terms of campus operations, Henry responded with one word: "Landscaping." He elaborated by explaining that,

> We need to get away from the ooh, ahh, bring them in from God knows where, all parts of the world because they look really neat, which is nice. But, let's, if we're going to, let's put our sustainability words into action and really focus on bringing in some plants that make sense for us. That's going to cut down on water, all sorts of stuff.

Although there was much support for irrigating with reclaimed water, interviewees indicated that there were areas of improvement with respect to what was planted throughout the campus landscaping.

These three major programs discussed thus far (recycling, solar PV, and reclaimed water) were the most successful large-scale campus sustainability initiatives that had been implemented at CBU. In addition to these three initiatives, there were a variety of other initiatives that had also contributed to CBU in its efforts to transition to green. The most significant of these other initiatives were green building, addressing climate change, and alternative transportation.

Green Building

Another area where CBU had demonstrated commitment to environmental sustainability was in the construction of some of their new buildings. As of spring 2011, the campus maintained three building complexes that achieved Leadership for Energy and Environmental Design (LEED®) certification from the U.S. Green Building Council (USGBC). To achieve LEED® status, buildings must earn points in six distinct categories: (1) Sustainable Sites, (2) Water Efficiency, (3) Energy and Atmosphere, (4) Materials and Resources, (5) Indoor Environmental Quality, and (6) Innovation in Design. All three of the LEED® certified buildings at CBU went through a rigorous

verification process with the USGBC in order to earn a minimum number of points in each of these six categories based on particular green building features and practices. One of the buildings is a residence hall, which achieved LEED® Certified, the most basic level of certification. Another residence hall achieved the next level higher, LEED® Silver. The new campus library most recently achieved LEED® Gold, the second to highest level. Additionally, CBU had plans to construct more new green buildings, such as the new science building that was in the design and fund-raising phase during spring 2011. By committing to green building practices, CBU demonstrated leadership in designing and constructing buildings that should be cost-effective, environmentally responsible, and healthier for building occupants.

Bill, a CBU administrator, commented on the LEED® program in his interview when he stated that,

> When this first started, the LEED® certification, they always said it was a ten to twenty percent cost associated to building the building. I'm not convinced that that's true any longer. I actually think, again, by some of the code requirements and just being conscious of when you're designing the building and constructing the building that it's not horribly difficult to get that to a certified LEED® level. There could be some costs when you start going to the other grades, you know, silver, gold, when you start getting to that level.

When asked about the new library project that he was leading, Bill spoke to the process of implementing the green building initiatives that resulted in achieving a LEED® Gold rating. He stated that, "It was a consciousness that we were always aware of when we were designing it, when we were building it. We were always aware of trying to get those few extra points to go to next level." This persistence paid-off at the end of the spring 2011 semester when CBU was finally awarded LEED® Gold for their new library.

Interviewees were generally positive about the push for LEED® certification. John, a faculty member, expressed his appreciation for the green building initiatives at CBU, stating that, "I think the commitment to design new buildings, especially given that we're going forward with a number of new ones, to LEED® certifications is a good thing." This sentiment was echoed by a senior environmental science student, Taylor. When asked about how the university might best invest its financial resources to support sustainability, she responded by saying that, "investing our money in the new buildings and making them either LEED® certified or along with those guidelines is a smart investment because it will save the university money." Examples of specific observations made of the LEED® certified buildings included the use of strategically placed windows to let in natural light as well as the placement of light shelves on windows to allow the daylight to penetrate further into the buildings. The use of energy-efficient lighting fixtures and low flow water fixtures was also observed, as well as the planting of drought-tolerant landscaping around the perimeters of the buildings. An official time-lapse video posted on the university website of the library construction project indicated that many appropriate site planning features were implemented during construction including storm water runoff management and dust control. As evidenced by documents, observations, and interviews, green building was an area of practice where CBU had been committed to campus sustainability.

Addressing Climate Change

A review of documents indicated that, in 2007, CBU's previous President signed the American College and University Presidents' Climate Commitment (ACUPCC), signifying the university's commitment to tracking greenhouse gas (GHG) emissions and

taking tangible steps to reduce GHG emissions across the campus. The ultimate goal of the ACUPCC is for CBU to become what is referred to as "climate neutral," meaning that the university would have a net-zero effect on climate change. Climate neutrality is reached by directly reducing GHG emissions through changing campus practices, and then buying renewable energy credits (RECs) and carbon offsets as a mitigation strategy to offset the GHG emissions that cannot reasonably be avoided.

While seen as a positive step, some interviewees had uncertainty about how well the university was doing in pursuing this goal and how attainable it was. One of the administrators, Frank, discussed this in his interview, stating that, "I'm glad that we signed-on to the President's Climate Commitment, but I'm not 100% sure how much the university really focuses on those commitments." Frank followed-up on this point by explaining that, "whether we can achieve climate neutrality or not, that's a big if, but I think as long as we're going in that direction and making progress every year then I think that's a good thing."

Growth versus climate neutrality. The CBU Climate Action Plan (CAP) Road Map document submitted to the ACUPCC in 2010 indicates that, although CBU had shown the beginnings of a commitment to reducing GHG emissions, there was not yet a comprehensive plan in-place to actually reach climate neutrality. Data reported in the CAP indicated that GHG emissions had risen steadily since CBU had been tracking this data. Thus, it appeared that if CBU continued along the trajectory of the reported trends in GHG emissions, CBU would not be able to substantially decrease emissions. On the contrary, without taking steps to dramatically change practices, CBU would continue to increase its GHG emissions. Results from GHG inventories conducted between 2004-

2009, as reported by the CAP document, indicated that the largest source of emissions at CBU resulted from purchased electricity utilized to power the campus, despite the fact that CBU generated a significant amount of electricity on-site through solar PV arrays. The GHG inventory data showed that electricity use had consistently increased each year. The other two largest sources of emissions resulted from automobile and airplane commuting as well as the on-site combustion of natural gas, each of which also had risen steadily since this data had been tracked.

With the rising GHG emissions between 2004-2009 identified, it may be assumed that, without substantial changes in practices implemented, CBU would continue to increase its emissions moving into the future. The newly adopted Twenty-Year Master Plan document for CBU lays the foundation for substantial campus growth including a number of new buildings being constructed as well as many more students living on campus. This new growth would inevitably be accompanied by an increase in GHG emissions as occupants in new buildings consumed more energy. Even if CBU were to construct LEED® certified buildings in the most energy-efficient manner possible, there would still be a marked increase in energy consumption and associated GHG emissions. So, the question for CBU becomes: how does the university reconcile its growth with its goal to reduce GHG emissions?

Essentially, the only way to reduce GHG emissions at CBU in this scenario would be to conserve energy and reduce the need for excessive commuting, as well as spend a lot of money on mitigation. However, these solutions would be far from simple, requiring major changes in thinking and practice, as well as a sizable financial investment in renewable energy credits (RECs) and carbon offsets. The entire CBU community would

have to create a new culture of behaviors and practices in order to allow the campus to meet these goals. Although these goals may seem practically insurmountable, they could theoretically be achieved with the right personal and institutional changes implemented. Only time will tell if CBU will be able to reach climate neutrality by their stated goal of 2050 (ACUPCC, 2011).

Alternative Transportation

One of the issues that came up frequently in interviews and was observed in meetings and side conversations was the subject of alternative transportation. CBU is located near a large metropolitan city center where public transit options were limited, leaving people heavily reliant on automobiles for transportation. The GHGs, smog, and congestion associated with this reliance on automobiles presented many challenges to CBU and the wider community. As might be expected, the parking situation at CBU was quite challenging. Staff, faculty, and students alike constantly complained about not being able to find parking when they drove to campus. This phenomenon applied to visitors as well. Although there were a handful of buses that passed by the university, there were no direct connections from the light rail stations to the campus, making it difficult for people from outlying areas to utilize public transportation to commute to CBU. Moreover, observations of the campus site vicinity indicated that the CBU campus and surrounding areas were not particularly bicycle friendly. The university also did not have any formal carpool or vanpool programs implemented. The majority of CBU community members drove their own cars to and from campus.

However, CBU had recently brought this issue to the surface, and some progress had been made. A green transportation sub-committee was formed, consisting of faculty and

staff who were passionate about these issues. The committee put together a plan for the university during the beginning of 2010, and then began working on these issues in the fall 2010 semester. Goals included making the campus more bicycle-friendly, setting-up a formal carpool and vanpool program, subsidizing the use of buses and light rail, and running a shuttle around campus and the adjacent neighborhoods to transport people.

One of the efforts made to address these issues was the implementation of the ZipCar© program. This independently operated program provided the campus with rental cars that were always parked in designated spots on campus when not in use. Community members could become a part of the ZipCar© program, and then get access to the cars when they were available. Using a website interface, people could reserve a ZipCar© on an hourly basis and only pay for the time they used. This could be much more cost-effective for CBU students and other community members than a traditional car rental situation, and could allow students who lived on campus the option not to keep a personal vehicle at CBU.

Observations over the course of the spring 2011 semester indicated that the ZipCar© program had doubled in size over the course of just a few months, demonstrating that there was much interest among campus community members including students. The ZipCar© program was originally targeted as a way to provide more mobility for students who did not have cars; promoting environmental sustainability was an added bonus to this. One of the staff members, Cathy, who championed the ZipCar© program explained her experiences implementing this initiative, stating that,

> I took a look at the ZipCar© website, I showed it to my boss, he thought it sounded good. We contacted ZipCar©, they were interested in working with us on our campus, and it took about a year before it got approval. We went to higher levels,

> who told us to go to lower levels, but then once the right people found out about it then they were able to push it within the higher levels. There was nobody that was opposed to it. I think it's just that it took getting the people who have influence to buy-in, and that was not hard because it was such a good idea.

As with many other campus sustainability initiatives, it was key to go through a formal implementation process that included planning and obtaining stakeholder buy in. By providing students who lived on the CBU campus with the ability to rent a car in an affordable and convenient manner, the CBU ZipCar© program created conditions conducive to student residents not needing to keep a personal vehicle on campus. Theoretically, this program represented both a financial benefit to CBU community members in terms of saving money on personal vehicle expenses as well as an environmental benefit in terms of reducing congestion, pollution, and GHG emissions. Since there was no data tracked on whether or not having the ZipCar© program on campus actually resulted in CBU student residents or other community members driving less or taking up fewer parking spots, it cannot be conclusively argued that the ZipCar© program was a success at the CBU campus from an environmental sustainability standpoint. Nonetheless, the fact that the CBU campus was attempting to implement tangible solutions to campus transportation issues spoke to the university's commitment to active engagement in the greening of the campus.

Increasing alternative transportation options. Although CBU was working on tangible solutions to transportation issues, interviewees expressed varying levels of satisfaction with the progress made up to the spring 2011 semester. For example, Marie, a CBU student, discussed ways in which the alternative transportation program could be improved. She stated,

> I think that . . . helping students not have to be in their vehicles, not having to drive from one side of campus to another. You know, perhaps having a shuttle that runs through campus. Perhaps having a shuttle that runs through the neighborhood even . . . and having that shuttle run off a clean source of fuel, would be a great movement.

Two other students agreed with Marie's idea of having a shuttle on campus. Taylor, a CBU student, said that, "If we had a shuttle system or something, that would be a good investment because it would really make an impact on our carbon footprint." Likewise, Denise, a CBU student, stated that,

> I would love to see a shuttle that catered to [the local neighborhoods] . . . I'd never, ever drive to work again, or to school again. I wouldn't. But I can't trust the buses, and there are quite a few times during the day when I need to get somewhere quickly. And if there were a shuttle, fine, I'll take the shuttle. But there's nothing like that, so I'm forced to be stuck in my car.

Similarly, Damien, an administrator, talked about increasing bicycling opportunities on campus, explaining that,

> I think that there's a great opportunity for us to reduce the number of vehicle trips on campus by simply encouraging people to ride their bikes. I've been thinking about it myself. But if I rode my bike, the next question is where do I park? Is there a place right outside the university that would facilitate that, and then what about taking a shower? All these things that our committee is working on, if those things were in place and they were part of our psyche, I think that's the main issue. It's not part of the University psyche, that hey, we want to be a bike friendly campus and therefore, if you have a bike, we're encouraging you to ride and here are all the structures that are in place to facilitate that.

Although CBU had taken many steps to increase alternative transportation options, some of the interviewees were not convinced that enough had been done. They pointed out the lack of reliability in public transportation, and linked this with the need for an even more active approach on the part of the campus to make up for perceived deficiencies in public transit.

As mentioned previously, the efforts to implement a comprehensive environmental sustainability initiative at CBU were complex and took place over a span of approximately 20 years. These efforts involved the greening of worldviews through both formal and informal educational activities that encouraged CBU students and other community members to change the ways in which they thought about environmental sustainability issues. Moreover, these efforts involved putting theory into practice on campus in the form of green campus initiatives such as recycling, solar energy, reclaimed water use, addressing climate change, green building, and alternative transportation. However, this analysis of CBU's efforts to change ways of thinking and practice begs the question: How did they do it?

The above descriptions of how CBU went about greening worldviews and greening the campus may be compelling, but the story does not stop there. These activities did not occur purely by coincidence or by happenstance. On the contrary, the 20-year process of campus greening at CBU was the result of several distinct change processes that were initiated and nurtured by leaders from across the university. The greening of CBU was a university-wide effort with many dimensions and nuances that emanated from institutional values and played out in the everyday decisions made by a diverse cross-section of faculty, administrators, staff, students and other CBU community members over time.

Leading a University-Wide Effort

For the purposes of this study, the process of leading CBU's university-wide campus greening effort has been divided into three distinct categories. First, this process is framed in terms of connecting sustainability to the university mission in order to form a

deeper understanding of how CBU fit this concept into its institutional values. Second, this process involved CBU getting the best bang for their buck in terms of investing financial resources. Third, this process involved the human dimension of administration, planning and engagement in support of this effort. Each of these three categories contains elements that were critical in CBU's university-wide effort to implement a comprehensive environmental sustainability initiative.

Connecting Sustainability to the University Mission

At CBU, the university mission served as an important driver of university-wide decision making. Thus, connecting sustainability to the university mission was critical for the campus community to form a larger sense of how sustainability fit into CBU's institutional values. The idea of environmental stewardship, or caring for the Earth, was an idea that came up in many of the interviews, was observed in on-campus conversations, and explicitly stated in CBU documents. This concept of stewardship was articulated by a CBU campus religious leader, Sam. When asked if he thought that environmental sustainability was connected to the mission of the university and the mission of his religious community, he responded positively:

> Thank you for the opportunity because when I was younger, I don't think people talked about it quite so much. They would say that kind of thing about, well, human beings are put in charge of the planet to make use of it. And then I think there's been a lot, even in faith-based people, it's like wait a minute. How about a concept of stewards? That is taking care of what is supposedly given to us by the Creator to take care of creation because it looks like we have the capacity to destroy or to sustain.

As Sam continued his explanation of how environmental sustainability fit with the university's values and the religious community's values, he spoke directly about how he felt regarding the moral obligation for CBU to promote environmental stewardship:

> So, I think it's coming through the religious tradition and it's being talked about a lot, and it's talked about a lot more than it was before. And, also, that is present among not just the upfront, card-carrying religious people, but an awful lot of people of good will. I think they get it, that this is not just a fad or a fancy. It's like it's come of age. This is something that we have an obligation and a responsibility for, so yeah, I do see it, believe it. I mean it comes into some of the prayer services. It's kind of a conscious saying, we need to take care.

The sentiments expressed by Sam were echoed in particular by Steve, a CBU staff member. Steve said that, "Being a good steward of our environment has been something very important and prominent in the [CBU religious community] worldview." Steve expanded on this statement by talking about how CBU's ethical position of considering environmental sustainability to be a value was different from other institutions who might only view sustainability as a priority. Steve explained that, at CBU,

> We want the green agenda, a sustainable campus, to be a value; something that's unchangeable, as opposed to a priority. I think right now it's a priority because society, across the board, is saying environmental stewardship has to be a high priority. But from CBU, it's always been a value. The [CBU religious community] thought there should be campus-wide recycling long before we were mandated to move in that direction by state law.

Although the concept of environmental sustainability was demonstrated by interviewees to have an implicit connection to the university's mission, this connection was not explicitly stated in the documents collected. The term "stewardship" was utilized in a few places on CBU's website. However, there were no well-articulated statements in any of the documents reviewed that explicitly stated how sustainability connected to the CBU mission. Nonetheless, interviews and observations of CBU community members indicated that there seemed to be an unwritten understanding of sorts that embraced environmental stewardship as an institutional value.

Perhaps one of the reasons that the concept of environmental stewardship was not explicitly stated in documents had to do with the tension between the ethics of sustainability and the practicalities involved with conducting university business. Interviewees addressed this tension, emphasizing the significance of considering both ends of the spectrum. For example, Steve articulated the importance of CBU having a practical approach to problem solving and implementing campus sustainability initiatives. He stated that the goal at CBU, "has always been to contribute to environmentalism, sustainability, stewardship in a tangible way, not just as a cheerleader but as scientists actually doing some of the primary research." Steve provided a label for this approach, stating that CBU "has been a force in pragmatic environmentalism." He claimed that CBU had been a testing ground for answering a lot of questions, such as "Is solar power affordable? Is reclaimed, non-potable water—is that system viable? Can we afford it, and does it really save a lot of money? Is recycling affordable?" Steve exhibited pride in the work that he had participated in on behalf of CBU for over 20 years, stating that, "I think we (CBU) have a very unique place in this conversation."

Frank, an administrator, elaborated on the relationship between ethics and pragmatism at CBU within the context of implementing campus sustainability initiatives. Frank explained that, at CBU,

> Like most anything financial, paybacks are key on a lot of these projects. So it's not always enough to say, hey, this is the right thing to do, and most people can agree on that. But when it comes down to choosing which project you do, you really need to look at it from a dollars and cents standpoint and say, if I invest my dollar here, what am I getting back out of it, besides it being the right thing?

As a complement to this comment, Frank also mentioned that, "I think you always have to keep that in mind. But on the other hand, there are things that you should do just on their merit, because they're the right thing to do."

Frank discussed the idea that some projects should be done even if they cannot be measured or justified in terms of dollars and cents. He said that, at CBU "we have to look at the human aspect of it too and what's going to benefit people's health and well-being. And you weigh that against the monetary return projects. And I think you have to just strike a balance." As Frank discussed, at CBU, it was important to strike a balance between the mission-based moral imperative of stewardship that drove decision making and the practicality inherent within a university context where there are competing interests and limited resources. The combination of these institutional values provided the foundation and framework for CBU to plan and administer green campus initiatives.

Getting the Best Bang for their Buck

One of the most frequently discussed ideas among the interviewees was the notion of getting the best bang for their buck. This common phrase was used by multiple interviewees as they responded to questions that had to do with how CBU might become a greener campus, and how CBU might best invest financial resources in campus sustainability initiatives.

Interviewees described the importance of maximizing resources and value in a difficult economic climate and with what is still a new and unproven concept in higher education. Frank, an administrator, made this point when he was asked what the main challenges or obstacles were to implementing campus sustainability initiatives. Frank's response was that, "I think obviously, number one, especially in this economic climate, is

finances. We always have to watch where we're spending the money and making sure we're getting the most bang for our buck and putting it in the best spots." Henry, a faculty member, also summarized this idea well in his interview when he said that, "If we truly want to become a sustainable campus and move even deeper into it, now it takes a financial commitment. But it has to be carefully placed. Where are we going to get the most bang for our buck?" A closer look at this vague question reveals that there are a number of specific ways to approach the development of an answer. Within the context of this study, answering the question of how CBU might get the best bang for their buck involved the ideas of doing their homework, starting with low-hanging fruit, and leveraging financial incentives.

Doing their homework. Some interviewees talked about the importance of "doing your homework" in the process of implementing campus sustainability initiatives. This cliché phrase referred to activities such as conducting research, surveys, feasibility studies, and other analyses that provided background information about an initiative to justify considering it for implementation. Steve, a CBU staff member, stated that, "You don't want somebody to give you a green light on a project that only has maybe half of your support because you're not sure if it's going to work or not. You've got to do your homework." This point was further developed by Damien, an administrator, as he discussed the importance of doing your homework before implementing a new program. He explained that, "there's a price for failure and say, for example, you implement a new program and it costs you a $100,000 and then all of a sudden you have to scrap it the next year."

As Damien described, the cost of failure can be devastating for campus sustainability initiatives because they are typically innovative programs that must prove themselves immediately to receive continued support. However, as much as Damien warned about the risks of failure, he also explained that there was much potential for campus sustainability initiatives at CBU, stating that, "I think here there are very few barriers. As long as it's a well thought out idea, I think there's some flexibility." By doing their homework, those involved with sustainability at CBU sought to develop a strategy that provided credibility to stakeholders and a strong foundation for a new campus sustainability initiative to grow from as it was implemented for the first time.

There were several examples of environmental sustainability homework being done at CBU in support of green campus initiatives. Each of the three major CBU green campus initiatives (recycling, solar PV, and reclaimed water) required extensive "homework" which included analysis with both an economic and an environmental emphasis. Another interesting example of CBU doing their homework was climate action planning. The process of collecting data on campus GHGs and planning initiatives that reduce GHGs requires extensive data collection and analysis, or homework. Although the CBU Climate Action Plan Road Map document indicated that CBU had not yet formalized a plan to transition toward climate neutrality, it nonetheless represented a concerted effort to conduct research and work toward formalizing a comprehensive climate action plan. This process of doing homework on an on-going basis to inform practice has likely resulted in more success for CBU than the campus might have otherwise achieved.

Starting with low-hanging fruit. A recurring thread among some of the interviewees was that it is important to start implementing sustainability efforts with the low-hanging fruit. As another cliché phrase used frequently, the idea of starting with low-hanging fruit entailed starting with campus sustainability initiatives that had highly achievable goals so that success was easily attainable. Once the low-hanging fruit were picked, and several of the simple, straightforward initiatives were implemented, then this success could be built upon and riskier initiatives could be taken-on. Interviewees had much to say about this. For example, Paul, a faculty member, referred to this notion when he stated that,

> When a campus decides to embrace sustainability, there's going to be some incredibly obvious low-hanging fruit to pick. And not to speak pejoratively about light bulbs, but when the university decides to go with high-efficiency light bulbs, I mean, there's some millions of dollars to be saved there and you want to go and do that kind of thing, and that's like the initial investment in these things.

Frank, an administrator, also discussed lighting retrofit projects as an example of low-hanging fruit, explaining that changing-out lighting fixtures and/or bulbs is, "a relatively easy way to save energy. There's rebates available so it's not super costly and a lot of those projects pay back in just a couple years or less." John, a faculty member, elaborated on this, stating that, "from the physical plant side, I think efficiency is the low hanging fruit to get." When speaking about efficiency, John included what Paul and Frank mentioned above regarding energy-efficient lighting. Taylor, a senior environmental science student, explained her thoughts on this matter by saying that "picking the low-hanging fruit is a good way to get started and then you can build-up if you get momentum." As Taylor pointed-out, investing campus financial resources in initiatives that have a high likelihood of being immediately successful, such as energy or

water-efficiency initiatives, can build a foundation for success that can be utilized later to build consensus for riskier proposals. However, at CBU taking environmental sustainability to the next level, and moving beyond the low-hanging fruit, appeared to be a much more involved process.

Leveraging financial incentives. At CBU, it was important to leverage financial incentives in support of more complex initiatives beyond the proverbial low-hanging fruit. Leveraging financial incentives in this context referred to obtaining external funding in the form of rebates, grants, or tax credits as well as implementing projects that had a high initial cost but could show a return on investment (ROI) within a reasonable amount of time. The best example of leveraging financial incentives from external funding sources was the CBU solar initiative. As mentioned previously, CBU made a substantial investment in a solar photovoltaic (PV) system. By leveraging generous financial incentives from local utilities and partnering with a company that was eligible to participate in a large government incentive program, CBU was able to get a huge bang for their buck by only having to pay for a fraction (less than 10%) of the initial out-of-pocket cost for their three large solar PV arrays. As with any investment, in the case of the PV arrays the university expected to get the best bang for their buck, or the best ROI. One way to demonstrate a high ROI is to leverage financial incentives from external funding sources. Frank, an administrator, discussed the significance of leveraging external financial incentives within the context of renewable energy projects when he explained that, "Knowing where to get government grants, tax credits, things like that are very important for renewable energy projects. And fortunately, there are opportunities

out there for those. So we continue to look at those." CBU found that the incentives made it easier for them to justify the upfront costs.

In cases where external funding was not part of the equation, it was nonetheless important to demonstrate the financial incentives inherent in any new campus sustainability initiative. Louise, an administrator at CBU, discussed the significance of financial incentives in her interview. When asked what strategies she thought successfully facilitated the implementation of green campus initiatives, she replied, "Showing a return on investment right off the bat. That makes it easy." Louise went on to discuss the importance of making a strong business case for campus sustainability initiatives, and showing a high ROI, explaining that it is critical because, "We're trying to keep the cost of education down, and I think we just have to pay attention to that." From the perspective of an administrator like Louise, a project with a fast payback is much less risky than a project that takes much longer to reap the financial benefits from. The high ROI of a project like the solar initiative made it much easier for someone at her level in the organization to get behind. However, not all CBU green initiatives were able to demonstrate such a high ROI. Some green campus initiatives, such as the recycling program, took much longer to recover the upfront, out-of-pocket financial investments. Nonetheless, CBU demonstrated evidence that green initiatives with a lower ROI were still considered for implementation.

Steve, a staff member, shared insight about investing in green campus initiatives with a low ROI. He described what leveraging financial incentives looked like over the long-term, stressing the importance of looking at projects with a low ROI within the scope of several years or decades. In reference to CBU's recycling program, Steve

explained that sometimes campus sustainability initiatives may, "have a lot of merit, but that merit doesn't appear until the fourth, fifth, or sixth year of operation when you can recoup some of these cost-savings that are inherent to the application or implementation of some of these programs."

Steve explained the importance of reflecting on the decisions that have been made, and showing the success of those decisions. One simple way to do this analysis was to compare the finances involved with implementing a particular initiative with a scenario in which the university would not have invested in that initiative. Sometimes it can be clearly demonstrated that, as Steve explained in reference to the CBU recycling program, "if we had done nothing, we would have spent more money than we spent today with the benefit of these programs in place."

In the case of the CBU recycling program, by avoiding waste hauling and tipping fees while simultaneously earning revenue through the sale of recyclable material commodities, the CBU recycling program was able to become a revenue-generating initiative over a period of several years. Eventually there was a financial payoff, but it took time for the return on investment to materialize. Although actual financials were not available to support this case, Steve stressed the importance of tracking performance of green initiatives like the recycling program. He indicated that it was important for CBU to continue to do their homework during and after the initial implementation phase of these initiatives so that success, or failure, could be more accurately measured.

At CBU, getting the best bang for their buck meant in part that it was important to leverage financial incentives. In cases where there was a high ROI, such as the solar initiative, it appeared to be more likely to get support from senior leadership. However,

in cases where the ROI was lower, such as the recycling program, it was important for the project team to demonstrate the feasibility of the project, and show that the project would pay for itself over a longer timeframe. By doing their homework, CBU was able to choose projects that made financial sense for the university. By starting with the low-hanging fruit, CBU built a track record of success by focusing on highly attainable projects. Finally, by leveraging financial incentives, CBU was able to tap into external funding sources when available, ultimately making the business decision more feasible for the university.

Planning, Administration, and Engagement

Although many of the interviewees discussed finances as being the main obstacle to overcome at CBU in the efforts to implement campus sustainability initiatives, this is not nearly the end of the story. Clearly, the financial dimension was critical to address for all of the reasons mentioned above. But at a certain point, the challenges of implementing these initiatives moved beyond issues of finance and involved the human dimension. Interviewees described implementing campus sustainability initiatives as contingent upon working with individuals and groups of people successfully. In order to effectively plan, administer, and engage the campus community in these initiatives at CBU, there were many levels of human interaction that had to be considered and addressed.

Building consensus from the top down and the bottom up. As evidenced by observations and interviews, one key to implementing campus sustainability initiatives at CBU was building consensus across various campus constituency groups. As the common catch-phrase says, it is important to get support from the top down and the bottom up. At CBU, this meant that it was important to get top-level support from senior

leaders and administrators. Additionally, it was important to build consensus among students, faculty and staff at various levels within the university. In terms of building consensus from the bottom up, it was also important to recognize that leadership could take the form of a grassroots type of effort that typically originated from student enthusiasm and leadership. John, a faculty member, described this dualistic model by explaining that, "I think we've got to increase involvement on campus with a sort of two-pronged approach. Very obviously, it's not anything revolutionary, but top down and then bottom up."

John discussed the importance of involving the President, the Trustees and the Regents, as well as providing opportunities for student engagement. Paul, a faculty member in the Urban Ecology department, echoed John's statement when he explained that, "The most successful programs are those that have, and this is true in any social movement, that have both bottom up and top down drivers." Henry, a faculty member, took this discussion a step further, stating that commitment and support needs to come from, "Top down, bottom up, in from the sides, wherever you can. From big ticket programs all the way down to just simple little things." Henry's insight was shared with Steve, a staff member, when he said that "to get something passed here at CBU, you have to build wide-ranging consensus."

At CBU, it was important to secure buy-in from the top down. As Frank, an administrator, succinctly stated, "if you don't have buy-in from the top down, it's really difficult to get things done." As much as the importance of top-down support was expressed by interviewees, actual top down support for green campus initiatives was not necessarily easy to secure at CBU. In some cases, it took some convincing for senior

leaders to become fully committed to particular green campus initiatives. Perhaps the most salient example of needing top down support was the initiative to have CBU's former President sign the American College and University Presidents' Climate Commitment (ACUPCC). Although this initiative was reportedly student-driven and supported by interested staff and faculty, the decision ultimately resided in the Office of the President. John discussed this in his interview:

> The previous President was reasonably on-board [with environmental sustainability]. He signed the [American College &] University Presidents' [Climate] Commitment. We were a founding signatory of that, which was good. But I will say, that came about because of the unbelievable heroic persistence of really a single student . . . and she basically, as much as a student could do, forced it. So, I think there was some will because she can't really force the President and the Board of Trustees to do what they don't want to do. So, there was some openness on that side. But we really need to, or we had to, I think, put a little pressure on the administration.

After some deliberation about the merit of signing the commitment, in 2007 CBU's President signed the ACUPCC, formally and symbolically committing CBU to taking tangible actions to address issues of climate change by reducing campus greenhouse gas emissions. Although it may have taken some amount of pressure from students and others to sway the former CBU President to sign the ACUPCC, there were other examples of top down leadership where there was not as much tension. For example, according to the institutional profile of CBU on the ACUPCC (2011) website, "In March 2007, [the former CBU President] formed the [CBU Sustainability Committee] and charged the group with identifying past, present and future initiatives that will help [CBU] maintain its position as an environmental leader." Although the forming of this committee was partially a result of the signing of the ACUPCC, this top-down directive by the former CBU President demonstrated buy-in and leadership from the top down. By

forming this committee, the former CBU President greatly assisted the consensus building process that was necessary to implement a comprehensive environmental sustainability initiative.

Similarly, another important piece of the consensus building process was to obtain bottom up support from students. Sam, an administrator, emphasized the leadership role that students can play when he described the need for, "some enlightened leadership, that doesn't necessarily mean always top down, but it can come from a student leader doing an editorial and getting people fired up, and then maybe doing something." Frank, an administrator, also discussed the importance of student involvement when he said that, "we need to continue in that area, in getting more students involved . . . . They pay our salaries, and when they're interested in getting things done people listen." Jack, an administrator, expanded on the point that Frank made when he stated that, "I really think the students guide the administration on the programs that they want. The last several years, the students have a grabbed hold onto this green idea with a stronghold." Jack talked about how important the student voice was, explaining that, "we as administrators have to provide those programs because that's what the students want."

One project of note that was driven almost exclusively by student interests was dormitory recycling. As successful as the CBU campus recycling program may have been considered, there were mixed reviews about dorm recycling based on the policy that students had to request a recycling bin for their room if they wanted one. The majority of students did not go through that step, and thus many students disposed of recyclables in the trash with their other waste. One student in particular, Janine, worked with CBU staff to bring this issue to the forefront. After a series of meetings and informal discussions,

Janine was able to convince the Housing Department and the Facilities Department staff to join forces and find a solution to this issue. As the data collection period for this study was ending, one of the last meetings observed was between staff from these respective departments working together to roll out a new dorm room recycling program in which each student living on campus would have a recycling bin in their dorm room by default. Examples such as this show how CBU students have been relatively successful at leading campus sustainability initiatives when they have focused their efforts.

In addition to securing top-down buy-in from senior leaders and bottom-up support from students, at CBU it was also important to build consensus among faculty and staff across all departments on campus. One way that CBU worked to build consensus among all of these various constituency groups was to form a campus Sustainability Committee, as well as a number of related sub-committees. Perhaps Sam, a campus religious leader, expressed the significance of green committees at CBU most succinctly. When asked what strategies he thought were most successful in the efforts to implement campus sustainability initiatives, he stated that, "I think you get people to see it and see the advantages that there are, then they can get excited about it, and then they can get on committees, and they can do something." Henry, a faculty member, discussed the significance of the CBU Sustainability Committee when he said that, "the fact that it's now meeting on a fairly regular basis and it includes staff, faculty, and students is good. Through that we're seeing things done." The CBU Sustainability Committee consisted of 15 members representing administrators, faculty, staff, and students. The committee reported directly to the Senior Vice-President of Administration, providing her with on-going recommendations to bring forward to the rest of the campus leadership including

the President and the Board of Trustees. Meeting minutes reflect that not every member attended each meeting, and that each meeting essentially consisted of a unique set of members with the exception of the Committee Chair, the CBU Sustainability Coordinator. The inherent nature of busy schedules held by all committee members limited a consistent meeting presence, and thus left the committee in a somewhat fragmented state. Nonetheless, the committee moved initiatives forward with strong leadership, utilizing electronic communications and holding smaller, more focused meetings with fewer committee members present.

One of the success stories of the CBU Sustainability Committee was their initiative to reduce bottled water use on campus, and instead install filtered tap water drinking stations across the campus. According to interviewees, for many years there was what many community members thought to be an excessive amount of bottled water use at CBU both in terms of the 5-gallon barrels used primarily by staff and faculty in their offices, as well as the small, single-serve bottled water purchased by all segments of the CBU population, most notably students. The committee met and worked together to strategize on how to reduce bottled water use.

Damien, an administrator, discussed the significance of the committee in implementing this initiative. He talked about how the committee worked together, "to get rid of the water bottles and input . . . the filtration systems. That was the new thing that came out of the committee, and I think that was a positive development." CBU worked with the same water company that they had bought bottled water from to convert their bottled water stations into filtered tap water stations. The catch for the water

company was that they had the exclusive rights to maintaining the fixtures and replacing the filters.

Although this represented an improvement in many ways, it only addressed water provided to staff and faculty in office and break room settings. With the exception of a couple of locations, most areas of the CBU campus that students had access to did not offer filtered tap water stations. The CBU Sustainability Committee continued to address this, and during the spring 2011 semester, CBU installed one of their first filtered tap water drinking station in a publically accessible location. Plans to increase these installations were discussed in the last CBU Sustainability Committee meeting observed in May 2011.

As discussed above, it was critical for CBU to build consensus from the top down and the bottom up in their efforts to implement a comprehensive campus sustainability initiative. It was also important for CBU to directly involve multiple campus stakeholders in committees and sub-committees that focused on these issues. Building consensus through the various means discussed was an essential strategy utilized at CBU. However, consensus-building activities were greatly enhanced by faculty and staff who were knowledgeable about environmental sustainability. Thus, in addition to building consensus among various groups within the CBU campus, in their efforts to green the campus it was also important for CBU to hire staff and faculty with expertise in this area.

Hiring faculty and staff with expertise. At CBU, one of the most critical strategies for greening the campus involved hiring faculty and staff with expertise in environmental sustainability. Interviewees discussed the significance of these efforts, and gave examples of recent CBU faculty and staff who were hired for this purpose. This issue

was explored with two primary emphases, the hiring of tenure-track faculty and the hiring of the CBU Sustainability Coordinator.

Faculty who were interviewed focused on the significance of hiring new faculty with expertise in environmental sustainability, but they also were careful to admit that the university ought to be cautious with these decisions due to their long-term consequences. John, a faculty member, discussed the importance of hiring tenure-track faculty with an interest in environmental sustainability, stating that, "one of the biggest things we could do to support the pedagogical mission of the university for environmental studies is hire people for whom environmental X, whatever it is, economics, philosophy, business, is their core research and teaching interest." However, although John and others might like to see this happen, he was quick to admit that it requires significant funding. John also noted the magnitude of the hiring decisions, saying that, "hiring tenure track people, that is a long-term commitment because assuming they make tenure, even if the economy gets tight, you can't fire them. They're stuck."

Paul, a faculty member, agreed with John's point about significance of hiring tenure-track faculty when he explained that, "These are lifetime jobs in the tenure track." Paul described the relationship between faculty and the university as a "sacred relationship" in which there is a pact made that allows faculty to keep their jobs for life. Paul expanded on this idea, explaining that, "if you do radical changes to a university, what happens if a whole set of faculty are no longer immediately relevant to the mission? Well, they're there for the rest of their careers." Nevertheless, Paul expressed his excitement for some of the recent faculty hires at CBU who had a specialization in environmental sustainability when he said that, "We're seeing that in Economics with an environmental

economics professor. We're seeing that in Urban Studies with an urban ecology person who's been hired recently."

Although it may be the case that hiring tenure-track faculty who specialized in environmental sustainability was critical for the process of CBU becoming a greener campus, these decisions were difficult to make due to the long-term implications. Still, the hiring of these new tenure-track faculty members was a clear indication that CBU valued environmental sustainability as an institution.

In addition to hiring faculty, many of the interviewees commented on the significance of hiring a staff member as CBU's first Sustainability Coordinator, whose purpose was to focus on implementing campus sustainability initiatives on a full-time basis. CBU created a new position for their Sustainability Coordinator, who was hired in February 2010. Louise, an administrator who championed the addition of the new position, stressed the importance of having the sustainability coordinator position. When asked what CBU's strongest asset was with respect to campus sustainability, she responded that, "If I had to single one thing out it would be our wisdom in adding a position dedicated to this. Because otherwise it becomes, you depend on it becoming everyone else's second and third thought." Jack, an administrator, echoed Louise's point, saying that, "If you don't have a person in that position, you tend to forget about that piece." Cathy, a staff member, built upon this idea when she stated that, " I think that we have had great improvements since the creation of the position of the coordinator of sustainability and I think that has helped unify all of the efforts that are going-on on campus." By having at least one full-time staff person focusing on implementing

environmental sustainability initiatives at CBU, the university was able to do a better job at coordinating these university-wide efforts.

Although the CBU Sustainability Coordinator had only been in this new position for approximately one year during the time of data collection, CBU had already been able to see some tangible results. One of the most notable accomplishments included CBU having their College Sustainability Report Card grade raised from a "B-" in 2010 to a "B+" in 2011. This program evaluation tool is recognized nationwide as one of the leading methodologies for demonstrating success in implementing comprehensive campus sustainability initiatives. The raise in CBU's grade represented to the CBU community that hiring of the position contributed to relatively quick results were able to be verified in hiring someone for this position. By doing a better job than what had been done in the past to gather data and complete the College Sustainability Report Card survey, the new CBU Sustainability Coordinator was able to assist the university in getting more credit than they had in the past for their achievements. This raised grade was commented on positively by staff, faculty, and senior leaders all the way up to the Board of Trustees. In addition to this achievement which showed public results, the CBU Sustainability Coordinator was credited with a variety of other accomplishments including improving the CBU Sustainability Committee as the Chair, building an effective team of student interns, creating a professional campus video, and leading new initiatives such a food waste diversion program and a campus community garden.

As discussed above, there was much support observed at CBU for the idea of hiring faculty and staff with expertise in environmental sustainability. Although the decision to hire tenure-track faculty with this expertise tended to be a slow and difficult process,

CBU nonetheless demonstrated an on-going commitment to its focus on environmental sustainability by hiring a number of new faculty with various areas of expertise in this area. CBU also exhibited its support for environmental sustainability on campus by creating a new position for a full-time staff member as the first CBU Sustainability Coordinator, which has since assisted the university in moving forward with its university-wide effort to green the campus.

Maintaining a green image. At CBU, as with many other universities, it was important for the university to maintain a green image. The university worked to maintain their green image through a multi-media approach which included the CBU campus website, videos, written outreach material, and hosting special events. CBU also frequently published articles about campus sustainability initiatives in CBU newspapers, magazines, and other publications. Documents such as these indicated that CBU was actively working on a university-wide level to present a positive image to the public with respect to the university's commitment to environmental sustainability.

Although documents indicated that CBU maintained a university-wide commitment to green initiatives, interviewees expressed varying opinions about the depth of CBU's commitments to environmental sustainability. Some interviewees described a sense of satisfaction and appreciation for how deeply CBU had embraced sustainability. For example, a CBU administrator, Sam, said that he was, "pleasingly amazed at the extent to which [CBU had] . . . aspired to greatness in environmental sustainability . . . I'm sure we've got a lot more to do, but I do see efforts; not just talking the talk."

However, not all CBU community members thought that the university maintained a deep enough commitment to environmental sustainability. Two of the interviewees

independently described CBU's commitment to environmental sustainability as sometimes seeming "skin deep," meaning that the commitment seemed to consist more of a focus on appearance rather than actual practice. These interviewees felt that CBU focused more on public perception and the outward beauty of the campus, than on the effectiveness of the actual green campus initiatives themselves. For example, when asked how well she thought CBU was performing in terms of environmental sustainability initiatives, George, a faculty member, explained that,

> I would consider us green aware. In certain areas, we definitely do a very good job. I sometimes have the feeling, I can't really think of specific examples right now, but I sometimes have the feeling that there probably are a few areas where the green is a little bit skin deep and that if you actually prodded too hard, you might not find that practices were as good as they could be. But things evolve. Things change.

Other interviewees mentioned that, for environmental sustainability initiatives to be successful, that campus leaders need to be more onboard in supporting sustainability practices. Roy, a CBU student, explained that it was the senior administrators that needed to make environmental sustainability more of a real emphasis on campus. When asked who he thought were the key individuals or stakeholders implementing environmental sustainability initiatives at CBU, he explained that,

> If anything really it would be the executives; because, you know, they're the ones, who sort of control everything, all aspects of the campus, and I almost kind of feel like with the sustainable movement here, it's only kind of skin deep . . . until the Board of Trustees and until the President, the high executives, really embrace the sustainable movement and the greening of campuses; it really hasn't taken hold until then.

Although it is important to keep a green image, as Roy alluded to, this image must emanate from real, effective programs that are supported on a university-wide level, from the grassroots all the way up the executive level.

Steve, a staff member, discussed the idea of green image in a different context, saying that CBU ought to move beyond the public relations value of campus sustainability. Instead, Steve argued that CBU should,

> Take a deeper look and see how we can continue the sustainable infrastructure conversation in a way that . . . goes beyond the sound bite or news blurb, and I think you accomplish that through the marriage of academics and infrastructure. That's what I think. I think that a lot of what we do [as CBU staff] can bleed right over into classroom applications and we should encourage those linkages.

By integrating the academic side and the administrative side of the university with respect to environmental sustainability, Steve argued that CBU might be able to more effectively develop and lead real university-wide initiatives that would sustain over time.

Henry, a faculty member, offered a similar perspective on the topic of maintaining a green image, emphasizing the importance of leading green initiatives through prioritizing and funding. He discussed the importance of real sustainability initiatives as opposed to just talking the talk. Henry explained that implementing campus sustainability initiatives entails, "putting your money where your mouth is." When asked what he thought were the biggest challenges and obstacles in implementing environmental sustainability initiatives, Henry stated that,

> Oh, probably everybody is so busy they don't have time. So, in other words, it's not a huge, huge priority. So, it's got to be made a priority and key people doing implementation have to have the time to do a good job. Yeah, because our dollars are limited, we can only do so much with our dollars and that translates into time too. And so priorities have to be set and once you've set the priorities and our sustainability projects get up there on the list, then they'll get done. And they have to be maintained. Whatever we do, we have to keep the ball rolling so that means you've got to have the infrastructure in place to do that.

By putting their money where their mouth is, Henry discussed the idea that CBU would be better positioned to implement real green initiatives that would sustain over time.

Although it was important to keep a green image at CBU, it was critical that this image was a reflection of authentic practices implemented in the real world. As described above, interviewees expressed varying opinions regarding the depth of commitment to green campus practices that CBU actually maintained. Some interviewees thought that CBU was truly as green as its image while others were more skeptical, even describing this commitment as only "skin deep."

Summary

Leading a university-wide campus greening effort at CBU was a complex endeavor that occurred over the course of many years and entailed the use of a number of strategies. Each of these strategies were grounded in the foundation of CBU's two institutional values of environmental stewardship and pragmatism. In addition to getting the best bang for their buck in terms of financial investments, CBU focused on strategies in the areas of planning, administration, and engagement. Through the combined efforts of CBU community members from across the university over the course of two decades, CBU was able to make significant progress in their campus greening efforts. However, this process did not occur overnight, and was not without challenges. As George, a faculty member, said, "you have to transition to being green." During the past two decades, this transitional process resulted from a university-wide effort to develop and expand environmental sustainability initiatives. This campus-wide effort has resulted in CBU being recognized as a university that ranks among the leaders of the campus sustainability movement in higher education. Perhaps the spirit of this effort was best summarized by a quote from a past CBU president found on the CBU website in which

he stated that, "It is our responsibility, as stewards of the environment, to educate, lead and take action to care for our world."

Conclusion

Through the combination of interviews, observations, and document review, this case study sought to answer the central research question for this study: how does a university implement a comprehensive environmental sustainability initiative? Triangulation of data from these three sources shows that CBU employed a number of strategies in order to overcome the obstacles inherent in this implementation process. For the purposes of this study, these strategies were discussed within the context of three distinct themes: Greening of Worldviews, Improving Green Campus Practices, and Leading a University-Wide Effort. These three themes embody the core strategies that emerged from the data, and the categories within each of these themes provide an organizational structure for the description of this implementation process.

The findings presented in this chapter have revealed that CBU has embraced the ethical imperative of environmental stewardship and developed a pragmatic approach to integrating theory into practice in this regard. Chapter 5 will provide a summary of these findings, demonstrating how they connect to the conceptual framework described in Chapter 1 and the literature reviewed in Chapter 2. Chapter 5 will also include a discussion of the implications of this research, as well as offer recommendations for further study.

CHAPTER 5

DISCUSSION

Introduction

Environmental sustainability is a concept that has become increasingly relevant to institutions of higher education in recent years, particularly in the last decade. The purpose of this study was to understand how a university implemented a comprehensive environmental sustainability initiative. By conducting a case study of Coastal Bluff University (CBU), this study triangulated data from interviews, observations, and documents to generate a description of the change processes involved with campus greening at CBU. In this chapter, a summary of findings and interpretations will be provided based on the research questions, and a conclusion will be presented. Then, implications of this research will be discussed. Lastly, recommendations for policy and practice will be offered and suggestions for further study will be advanced.

Findings and Interpretations

The findings of this study were presented as a description organized by three themes: Greening of Worldviews, Green Campus Practices, and Leading a University-Wide Effort. These themes were further developed by breaking each theme into categories and sub-categories that provided the structure needed to articulate the various change strategies employed by CBU in their campus greening efforts. Collectively, these themes, categories, and sub-categories provided a framework for answering the primary

research question as well as the three research sub-questions. The primary research question driving this study was: *How does a university implement a comprehensive environmental sustainability initiative?* The primary research question was further explored through the following questions:

1. What strategies did the campus pursue in their efforts to implement a comprehensive environmental sustainability initiative?

2. What facilitates the adoption of a comprehensive environmental sustainability initiative?

3. What obstacles or challenges were faced throughout the process of implementing a comprehensive environmental sustainability initiative?

Accordingly, these research sub-questions will be answered below, with the primary research question answered in the Conclusion section that follows. Throughout this discussion, references will be made to relevant literature as well as the conceptual framework presented in Chapter 1 of this dissertation.

Research Sub-Question #1: What Strategies Does the Campus Pursue in Order to Implement a Comprehensive Environmental Sustainability Initiative?

In the case of CBU, a number of strategies were pursued in support of their campus greening efforts. The practice of implementing a comprehensive environmental sustainability initiative at CBU entailed employing strategies in the areas of operations, education, research, and the external community. Each of these dimensions of green campus practice were addressed when implementing a new initiative.

Operations. Perhaps the most significant strategy that CBU engaged in was in the area of operations. A close look at CBU revealed that the campus had implemented a

number of green campus practices over the course of two decades. Most notably, CBU implemented a campus-wide recycling program, a relatively large set of solar photovoltaic (PV) arrays, and a reclaimed water system for irrigating campus landscaping. In each of these cases, CBU was an early adopter and thus the campus was able to obtain buy-in largely based on a sense of ethical responsibility. However, for all three of these initiatives, CBU was also able to leverage financial incentives and demonstrate a strong business case for going green. These strategies can serve as models for other institutions that are looking to implement similar initiatives.

The significance of green campus operations was mentioned ubiquitously in the literature (Bardaglio & Putnam, 2009; Creighton & Rappaport, 2007; M'Gonigle & Starke, 2006; Simpson, 2008). As was the case with CBU, the literature indicates that hundreds of colleges and universities are developing strategies to improve campus operations by transitioning to green. Although each campus has challenges that are unique, campuses also face many of the same challenges in their efforts to green campus operations. Strategies such as recycling, generating renewable energy, conserving water, and building green are mentioned in the literature within the context a whole spectrum of colleges and universities, from big Ivy League schools like Harvard and Yale all the way down to small schools and community colleges like College of the Atlantic in Maine and Butte College in California. These operations strategies assist campuses like CBU in their efforts to address concerns of an economic, social, and environmental nature in a cohesive manner.

Education. Another significant of strategy at CBU was a focus on education. CBU employed a diversified strategy of reaching the campus community in an effort to

encourage learning about environmental sustainability. This strategy entailed the encouragement of learning both in the classroom, through formal curriculum, as well as outside of the classroom, through co-curricular and extra-curricular activities. By offering graduate and undergraduate academic programs in environmental science, urban studies, and related subjects, CBU students were provided with the opportunity to learn about environmental sustainability as an academic discipline. Moreover, by offering service work and outreach activities, CBU students and other community members were provided with hands-on and experiential learning opportunities. This strategy encouraged the CBU campus community to think critically about environmental sustainability, and question assumptions that comprise individual worldviews. This strategy was described earlier as the "Greening of Worldviews."

This same notion was found repeatedly in the literature (Bartlett & Chase, 2004; Blewitt & Cullingford, 2004; Orr, 2004). The starting point of any campus greening initiative is rooted in the philosophical foundation of a particular way of thinking, or a worldview. Underlying the concept of environmental sustainability is a deep moral imperative that attributes intrinsic value to nature and demands that we preserve the environment for current and future generations (Cortese, 2003; Orr, 2004).

Research. Another strategy pursued by CBU in support of environmental sustainability was research. At CBU, there were several research projects being conducted related to environmental sustainability at any given time. Faculty from across disciplines were engaged in research projects, such as sociology faculty studying the greening of communities, biology faculty studying wetlands restoration, philosophy faculty studying the ethics of environmentalism, engineering faculty studying climate

change, and business faculty studying social and environmental responsibility. By conducting research that contributed to environmental sustainability, CBU displayed leadership as an educational institution dedicated to solving some of the world's most pressing concerns. Moreover, by demonstrating the results of research on campus, CBU has provided models for the external community to consider adopting in other settings and possibly on larger scales. Initiatives such as CBU's recycling program, solar PV system, and reclaimed irrigation water system were observed to be living proof that campus sustainability initiatives can serve as models that demonstrate the economic, social, and environmental benefits of transitioning to green.

The strategy of conducting research for environmental sustainability was mentioned throughout the literature as well. Scholars have argued that higher education has an ethical responsibility to conduct research on environmental sustainability, as colleges and universities are the best-suited organizations for such work (Bartlett & Chase, 2004; Cortese, 2003; Crieghton & Rappaport, 2007; Orr, 2004). Campuses such as CBU are harnessing the strength of their research capacities and developing solutions that may allow all life to flourish moving into the future. In addition to conducting research in laboratories or faculty offices, the literature refers to green campuses as becoming living laboratories for environmental sustainability research, where students can learn and conduct research by interacting with the larger physical campus (Creighton, 1998; Edwards, 2010).

External community. At CBU, it was observed that the university's relationships with external stakeholders were generally very important. In particular, CBU was in the final stages of passing their Master Plan through the local municipal government. This

process took an extensive amount of time and was expensive financially as well. The newly passed Master Plan had an emphasis on environmental sustainability, discussing ways in which CBU would work to reduce environmental impacts and act as leaders in the region by modeling sustainable solutions. Some of the items mentioned in the CBU Master Plan document included constructing green buildings, expanding native and drought-tolerant landscaping, and taking steps to reduce automobile traffic to and from campus.

In addition to the master planning process, CBU worked to communicate green efforts to external stakeholders in other ways such as participating in green campus surveys and rating systems, competing in a national collegiate recycling competition called RecycleMania, as well as sending staff and faculty to conferences and other events to speak and present the work that CBU had accomplished in their campus greening efforts. In an effort to reach younger students of the millennial generation, CBU engaged in digital communication strategies such as creating a website, videos, and FaceBook© groups focused on environmental sustainability. All of these efforts, as well as others, were important for CBU to maintain a green image in the external community.

The idea of maintaining a green image to keep positive relations with external stakeholders, as well as to attract prospective students, was also expressed in the literature (Bardaglio & Putnam, 2009; Princeton Review, 2010). Additionally, the literature discussed the significance of understanding the needs of the millennial generation in terms of communicating through social networking, videos, and other multimedia (Bardaglio & Putnam, 2009; Edwards, 2010). These young students are organized and technologically savvy. Thus, it has become important for colleges and

universities to reach the millennial generation of students through the various digital means that they are accustomed to communicating through.

Although it was important for CBU to maintain a green image, it was also important that his image was grounded in authentic practice. However, data from this study indicated that there may have been some disagreement as far as how authentic CBU's green practices were. Some of the interviewees from this study questioned the depth of CBU's commitment to environmental sustainability, explaining that the university may have focused more on image than actual practices in its campus greening efforts, even describing CBU's approach to campus greening as sometimes "skin deep." This dichotomy can be thought of as a tension between what the literature describes as strong versus weak approaches to sustainability. Interviewees who described CBU's commitment to sustainability as sometimes skin deep meant that CBU was demonstrating a weaker approach to sustainability, whereas in other cases CBU may have demonstrated a stronger approach to sustainability. A weaker approach to sustainability might allow for a stronger green image without the actual practice to support it, while a stronger approach to sustainability would likely demand that a green image be grounded in authentic practice with more integrity. As both the literature and the findings from this study indicate, it is important that a campus' green image is supported by evidence of authentic practice and, ideally, success.

Research Sub-Question #2: What Obstacles or Challenges are Faced Throughout the Process of Implementing a Comprehensive Environmental Sustainability Initiative?

In the case of CBU, there were two obstacles or challenges that seemed to be the most significant: (1) funding issues, and (2) balancing plans for growth with plans for

reducing environmental impacts. The issue of funding was observed to be a challenge at CBU in many ways as the campus implemented a comprehensive environmental sustainability initiative. CBU struggled with the financial realities of the global economic downturn that began in 2007 and persisted through the data collection period in spring 2011. Observations during several CBU sustainability committee meetings revealed that funding was one of the most commonly discussed topics, usually in reference to how new green campus projects might be funded. One example of note was that the CBU Sustainability Coordinator position was reportedly originally designed to be filled in 2007. However, as a result of the global economic crash and ensuing recession, there was a hiring freeze at CBU until late 2009 and the position was not filled until early 2010. This gap in hiring a full-time professional staff member to focus on these issues was an example of how funding, or the lack thereof, was one of the most significant challenges at CBU in terms of implementing a comprehensive environmental sustainability initiative.

The issue of funding is ubiquitously cited in the literature as a major challenge to implementing campus sustainability initiatives (Anderson, 2009; Barlow, 2009; Blackburn, 2007; Creighton & Rappaport, 2007). The need for financial support can be thought of in terms of Bolman and Deal's (2008) structural frame in that, for green campus initiatives to thrive, there must be structural support in terms of buy-in, and perhaps more importantly, in terms of funding. Although over the long-term environmental sustainability initiatives arguably can be more cost-effective than status quo policies and practices, green initiatives frequently entail a larger initial financial investment (Bardaglio & Putnam, 2009). The risk inherent in these types of investments

can deter support, or make it much more challenging to obtain buy-in from the top down, a challenge frequently noted by those in this study.

Although in the case of CBU, as well as in the literature, there are examples of obstacles and challenges to implementing a comprehensive environmental sustainability initiative, CBU continued to push forward on addressing these issues. By investing upfront in big ticket programs such as recycling, solar photovoltaic systems, and irrigating with reclaimed water, CBU demonstrated that issues of funding can not only be overcome, but can be shown to have a net-savings and/or a revenue-generating capacity. Accordingly, the literature describes the need to address issues of funding with respect to campus greening efforts (Bardaglio & Putnam, 2009; Barlow, 2009; Creighton & Rappaport, 2007).

Nevertheless, the literature also describes ways in which funding challenges and obstacles have been overcome. Campuses have found creative ways to address these funding concerns such as implementing green revolving funds, student green fees, power purchase agreements, and other creative endeavors (Bardaglio & Putnam, 2009; Barlow, 2009; Sustainable Endowments Institute, 2011). At CBU, this was also the case. Observations and interviews indicated that CBU had leveraged funding through grants, rebates, and recycling revenues to fund new green campus projects. By exhibiting this level of commitment to funding environmental sustainability initiatives, campuses such as CBU are demonstrating that real solutions to some of the biggest challenges in higher education can be realized.

Another challenge or obstacle that CBU faced was a conflict inherent in their future plans for the university. With plans to continue growing as a campus while

simultaneously desiring to have less of an impact on the environment, CBU was left in a quandary. This contradiction was illustrated best in CBU's climate action planning efforts in that, although theoretically the campus symbolically agreed to achieving climate neutrality, the reality was that this goal would be impossible without implementing major cultural and institutional changes. Although the previous CBU President had signed the American College and University Presidents' Climate Commitment (ACUPCC), CBU's Climate Action Plan Road Map document showed that, at the time that this study was conducted, CBU was not making significant progress in this area.

Not only was CBU not on the path toward climate neutrality, but CBU was actually increasing its greenhouse gas (GHG) emissions each year, with no formal plans yet in-place for changing this trajectory. For CBU to change its course of action in this area, the campus would have to implement a number of major changes in policies and practices involving GHG emissions, which would dramatically alter the status quo of university planning. The changes that would need to be made can be thought of as what Cuban (1999) described as "tinkering" with first-order changes in order to reach long-term goals. By strategically developing ways to reduce GHG emissions, such as conserving energy and purchasing offsets, CBU could eventually elevate its climate action planning efforts. The synergistic effect of implementing a series of incremental, first-order changes could potentially lead to a higher level of second-order change that could allow CBU to completely transform itself in the effort to achieve climate neutrality.

These challenges were not unique to the CBU campus. The literature demonstrates that colleges and universities worldwide are facing similar challenges in their climate

action planning initiatives (Creighton & Rappaport, 2007). Nonetheless, the goal of climate neutrality is gaining widespread support in higher education (Bardaglio & Putnam, 2009). Ultimately, to reach climate neutrality CBU would have to not only change strategies in planning, but the campus would have to re-think its funding priorities as well.

Research Sub-Question #3: What Facilitates the Adoption of a Comprehensive Environmental Sustainability Initiative?

This case study of CBU has provided insight into the process of how a university implemented a comprehensive environmental sustainability initiative over the course of two decades. The process of change that CBU engaged in can be better understood through Bolman and Deal's (2008) four frames model that views organizations from structural, human resource, political, and symbolic perspectives. Peering through these four lenses can help educational leaders to make sense of the complexities involved with institutional change. At CBU the structural, political, and symbolic frames seemed to be the most significant. The human resource frame was not as much of a focus, although there were key human resource elements supporting CBU's comprehensive environmental sustainability initiative. The four frames will be used to organize the discussion below of what facilitated the adoption of a comprehensive environmental sustainability initiative at CBU, as well as how planning was described in the literature.

Structural. CBU implemented a comprehensive environmental sustainability initiative in part by wisely investing financial resources and hiring people with expertise to oversee implementation. By investing financial resources in major programs such as recycling, generating renewable energy, and irrigating with reclaimed water, CBU was

able to demonstrate that allocating funds for campus sustainability initiatives could be financially prudent. In addition, by hiring staff and faculty with expertise in environmental sustainability, CBU showed that making the structural decision to hire these individuals could provide benefits to the campus that would further the goal of implementing a comprehensive environmental sustainability initiative.

The literature frequently makes reference to the importance of addressing issues of planning for environmental sustainability, with an emphasis on funding (Bardaglio & Putnam, 2009; Barlow, 2009; Creighton, 1998). Although the literature generally agrees that green campus initiatives usually require initial financial investments, it is also generally agreed that substantial money can potentially be saved over time. In some cases, such as recycling, green campus initiatives can become a net-gain in that they pay for themselves and generate on-going revenue streams for the campus. This was reportedly the case at CBU, where initial investments in equipment and the hiring of staff for the campus recycling program resulted in both cost-savings through avoided disposal fees and revenue-generation through the sale of recyclable commodities. By investing financially in a long-term strategy such as recycling, campuses like CBU are able to provide the structural support needed to facilitate the adoption of a comprehensive environmental sustainability initiative.

Human resource. From the perspective of the human resource frame, there is a symbiotic relationship between an organization and the people who participate in it. This is particularly the case in a university setting. All campus community members have something to gain from their association with the campus, and they also have something to give back. For CBU, the human resource frame perspective was not as critical as the

other three frames. Nonetheless, there were key human resource elements that supported the implementation of CBU's comprehensive green campus initiatives. For example, CBU actively participated in sustainability-related conferences and other professional development events through their membership in AASHE, the ACUPCC, and other campus sustainability organizations. By providing these professional development opportunities to staff and faculty, CBU invested in their human resources such that the campus might benefit as a whole from the expertise and leadership that these faculty and staff provide to the university.

Political. Considering the case of CBU from the political frame perspective, it was critical for CBU to engage in the process of building a wide-ranging consensus among campus constituents. At CBU, it was critical to obtain support for green campus initiatives from the top down and the bottom up. By working cooperatively, CBU was able to integrate green ideals and practices into the culture of the university. The best example of this was the formation of a sustainability committee to take the lead on goal setting and planning for their green campus initiatives. The CBU Sustainability Committee was comprised of administrators, faculty, staff, and students who were passionate about implementing these initiatives. This committee was responsible for discussing these issues, formulating plans of action, and providing recommendations to senior leadership. These recommendations were decided upon at the executive level and then corresponding plans for implementation would filter back through the committee and out to the appropriate campus community members with instructions for taking action. In this way, the CBU Sustainability Committee facilitated the adoption of various environmental sustainability initiatives.

The significance of sustainability committees in higher education was heavily cited in the literature (Bartlett & Chase, 2004; Creighton, 1998; Creighton & Rappaport, 2007). The literature also made mention of "green teams," "steering committees," "task forces" and other types of groups that were very similar in nature to campus sustainability committees (Anderson, 2009; Blackburn, 2007; Hitchcock & Willard, 2008; Olson, 2010). Much like CBU's Sustainability Committee, other colleges and universities have formed committees to help facilitate the adoption of environmental sustainability initiatives. Bolman and Deal (2008) discussed this in terms of the political frame, explaining that organizations such as colleges and universities operate within a context of scarce resources and enduring differences in institutional values. These cultural differences, coupled with the lack of resources, results in political power struggles that divide organizations into various coalitions and other constituency groups.

By bringing together individuals from across the university who represented various constituency groups, the CBU sustainability committee was committed to working through differences in thinking and prioritizing. This persistence enabled the committee to refine the consensus-building process among these competing interests and focus on campus greening efforts in a collaborative way. By involving multiple stakeholders from diverse areas of the organization, a committee can serve as a catalyst for change and greatly expedite the process. This can be particularly useful in higher education, as it is well documented that change in higher education is a slow and difficult process (Boyce, 2003).

Another example of fostering collaboration that fits into the political frame perspective was CBU's emphasis on trans-disciplinary and inter-disciplinary work among

faculty. At CBU, it was important to promote faculty collaboration around environmental sustainability in their efforts to infuse sustainability across the curriculum. This trans-disciplinary approach manifested in the new Environmental Studies Minor that CBU had implemented in the fall 2010 semester as a collaborative effort between the College of Liberal Arts and the College of Science and Engineering. More recently, this approach to sustainability education took the form of a new trans-disciplinary center being designed during the spring 2011 semester. By creating this new center, CBU is in a position to support faculty from all disciplines in their efforts to collaborate on the implementation of sustainability research and initiatives both on campus and off campus.

By promoting faculty collaboration across disciplines, CBU strove to develop new and innovative approaches to solving some of the world's most complex and critical problems. The significance of interdisciplinary and transdisciplinary collaboration for environmental sustainability in higher education was also found in the literature. There seemed to be a consensus among scholars in this area that inter-disciplinary and trans-disciplinary approaches to environmental sustainability education tended to be the most effective (Bartlett & Chase, 2004; Blewitt & Cullingford, 2004; Creighton & Rappaport, 2007; M'Gonigle & Starke, 2006).

Symbolic. Looking through the lens of the symbolic frame, it was important for CBU to demonstrate a public, symbolic commitment in support of environmental sustainability. CBU had been recognized for leadership in environmental sustainability in a number of ways such as winning State and Federal awards for green initiatives as well as placing high in a national collegiate recycling competition known as RecycleMania. These symbolic achievements demonstrated CBU's commitment to

campus greening. Another symbolic finding from this study was that CBU signed the American College and University Presidents' Climate Commitment (ACUPCC), pledging the university to become climate neutral by 2050 or before. All of these sorts of examples were mentioned in the literature as well, indicating that symbolic commitments to environmental sustainability were common among many colleges and universities (Bardaglio & Putnam, 2009; Bekessy et al., 2007). Communicating these symbolic commitments to sustainability can be of great importance for educational leaders seeking to increase the competitiveness of their campuses and rally support around ambitious, value-driven goals.

Drawing from Bolman and Deal (2008), it is important that campus community members understand the symbolic significance of environmental sustainability as both a worldview and a way of living. In particular, symbolic representations of environmental sustainability were present within the context of CBU. In addition to the focus on environmental sustainability in the curriculum, CBU exhibited green symbolism in multiple forms such as campus signs, advertisements, outreach materials, and videos. Each of these symbolic forms of communication helped to tell the story of how CBU was transitioning to green. These forms of symbolism, as well as many others, demonstrated the significance of environmental sustainability as a way of thinking that permeated the campus culture, providing a larger sense of meaning for campus community members. This broad symbolic communication can be important for colleges and universities that are working to project a green image to both internal and external stakeholders.

The case of CBU demonstrates the importance of presenting and maintaining a green image. The literature also discussed the importance of keeping a green image in higher

education institutions (Princeton Review, 2010). It has been argued that colleges and universities that fail to address sustainability and make the transition to green will find it increasingly difficult to compete in the marketplace for students (Bardaglio & Putnam, 2009). Colleges and universities are now expected to be green institutions as well as the primary places where people learn about environmental sustainability (Simpson, 2008). However, although the literature discusses the importance of maintaining a green image, this image must be grounded in authentic practice and process. Maintaining a green image is not merely for marketing purposes. Organizations such as colleges and universities cannot just provide "green wash" to their stakeholders (Anderson, 2009).

As mentioned previously, some interviewees felt that CBU focused more on a symbolic sense of maintaining a green image rather than maintaining actual, authentic practices. One of the dangers of a perceived focus on symbolism alone, without corresponding structural, human resource, or political changes, is that stakeholders could feel a sense of frustration or even cynicism. This sense of frustration or cynicism could become counterproductive to the point that stakeholders lose respect for the symbolic communications of the organizations, leading to higher levels of discord within the organization. The data from this study did not indicate high levels of frustration or cynicism in this regard. Nonetheless, with an over-emphasis (or even a perceived over-emphasis) on the symbolic frame, CBU could run the risk of this result.

Institutions such as CBU are much more likely to effectively implement a comprehensive environmental sustainability initiative if all four frames are employed. This is important for both internal and external stakeholders, who demand evidence that campuses are deeply and formally committed to environmental sustainability. Much of

this evidence is communicated through various green campus surveys, green report cards, and most recently the AASHE STARS program. For example, in the case of CBU, their green image was evidenced by attaining a "B+" in the 2010 College Sustainability Report Card published by the Sustainable Endowments Institute. Moreover, in spring 2011, CBU was observed to be in the data collection stage of their participation in the AASHE STARS program. By communicating a symbolic commitment to campus greening in these and other ways, educational leaders can maintain a green image and better compete as an institution (Princeton Review, 2010).

Perhaps the most significant symbolic aspect of sustainability at CBU was the connection to the university mission through the concept of environmental stewardship. By connecting the idea of caring for the environment, or creation, to the faith-based mission of the institution, CBU provided a deeper sense of meaning to the campus community. Looking through the symbolic lens helped CBU leaders develop ways of connecting with stakeholders and led to greater success for the institution overall.

Conclusion: How Does a University Implement a Comprehensive Environmental Sustainability Initiative?

A simple answer to the primary research question is that, at CBU, the campus implemented a comprehensive environmental sustainability initiative by engaging in an on-going, iterative process of greening worldviews, improving green campus practices, and leading a university-wide effort. The relationships between the findings and the research questions are presented visually in Figure 6, demonstrating the complexity and interconnectedness involved with campus greening efforts at CBU.

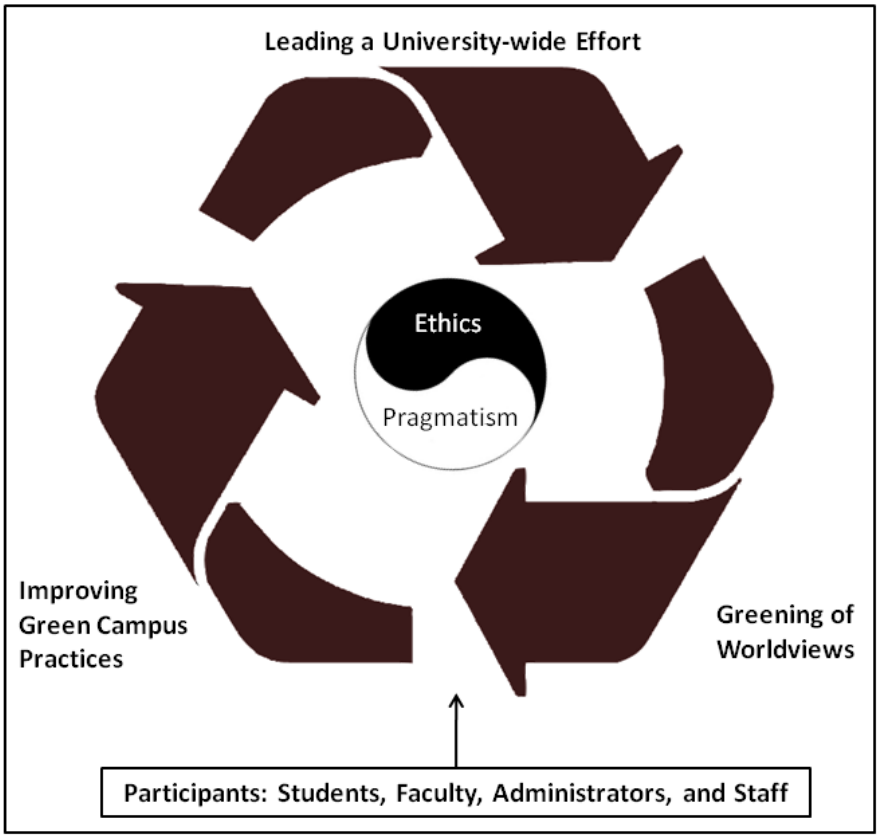

FIGURE 6. Depiction of the interconnectedness associated with campus greening efforts at CBU driven by the thoughts and activities of the participants in this on-going process.

Within the context of CBU, the approach to campus greening united ethics and pragmatism, which can be viewed symbolically as the core value that drove decision making about environmental sustainability. At CBU, these two institutional values were blended, and together they can be viewed as the over-arching conceptual driver for changes leading toward the implementation of a comprehensive environmental sustainability initiative. An ethical understanding of why environmental sustainability is the right thing to do, coupled with a pragmatic understanding of how these changes can be made most effectively, comprised the starting-point for leadership in this area. By rooting change strategies in this marriage of ethics and pragmatism, CBU built a

foundation from which to take incremental steps in greening the worldviews of the campus community as well as greening the physical campus.

As Figure 6 indicates, the process of implementing a comprehensive environmental sustainability initiative at CBU entailed an on-going, iterative process of greening worldviews, improving green campus practices, and leading a university-wide effort. This university-wide effort was engaged in by a diverse make-up of students, faculty, administrators, and staff participating in the implementation process. Figure 6 represents the interconnectedness of these four types of participants as they interacted over time in the perpetual processes of personal and institutional greening. By changing the ways in which individuals thought and behaved, CBU was able to transform their campus from a traditional university into one of the leading green campuses in the nation.

CBU's transition to green resulted from a university-wide effort to implement changes in thought and practice, along with leadership to promote these efforts for environmental, social, and economic well-being. On the academic side, CBU greened worldviews through formal and informal education programs. On the administrative side, CBU implemented a wide range of green campus initiatives including recycling, generating renewable energy, irrigating with reclaimed water, climate action planning, constructing green buildings, and promoting alternative transportation. In terms of university leadership, green campus initiatives were led by a diverse spectrum of individuals from across the university consisting of CBU students, faculty, administrators, and staff.

As Figure 6 shows, it took widespread and diverse involvement to implement the kind of change taking place at CBU around environmental sustainability. All of the

individuals involved in this comprehensive implementation process at CBU played critical roles, with leadership and participation coming from many places and many levels. More traditional top-down leadership came from administrators and faculty who controlled the major decision-making at the university. Faculty developed and implemented academic programs that offered curricular, co-curricular, and extra-curricular learning opportunities focused on environmental sustainability. Administrators worked with all campus stakeholders to identify green campus initiatives that were feasible and financially sound, and to facilitate planning and communication.

At the same time, grassroots leadership emerged from students and staff working up from the ground floor to change the ways in which decisions were made. Students displayed a high level of enthusiasm for sustainability and used their various methods of influence to green the institution. For instance, the students spearheaded the effort to have CBU's previous president sign the American College and University Presidents' Climate Commitment (ACUPCC). Staff carried-out the majority of the physical and organizational work supporting these institutional greening efforts, and at times showed leadership in facilitating efforts—as in the case of the ZipCar program. Taken together, all of the individuals responsible for implementing these initiatives at CBU had unique roles to play, and each contributed meaningfully to the on-going, iterative process of campus greening at CBU.

This study sought to understand how a university implemented a comprehensive environmental sustainability initiative. CBU had been engaged in the process of campus greening for approximately 20 years, resulting in distinct changes to the fabric of the institution. Campus greening efforts at CBU included changes made within the academic

departments through the development of curriculum and co-curriculum, as well as within the administrative departments in the form of improving green campus practices. Through the combined efforts of campus community members working together across disciplines from the top down and the bottom up, CBU was transformed from a traditional university campus into one of the leading green campuses in the United States. This transition to green was the result of a concerted effort to re-think the goals of the university, plan with the well-being of current and future generations in mind, and commit funding to initiatives that can show economic, social, and environmental benefits.

Implications

The purpose of this study was to understand how a university implemented a comprehensive environmental sustainability initiative. This case study of a single institution provided insight into the processes employed to achieve this goal. The findings from this case study may be transferable to similar institutions, and may assist educational leaders in answering similar research questions. For the purposes of this case study, the discussion of implications will be organized in terms of four insights that this study revealed about implementing a comprehensive environmental sustainability initiative on a university campus: (1) Balancing ethics with pragmatism, (2) Peering through the four frames, (3) Reconciling campus growth with environmental impacts, and (4) Advancing education for sustainability in higher education.

Balancing Ethics with Pragmatism

The findings from this study suggest that institutions may benefit by combining a sense of pragmatism with a strong, ethical vision when pursuing change initiatives such as sustainability. At CBU, this union of ethics and pragmatism served as a core

institutional value that campus decisions could be grounded in. In many ways, the sense of ethics at CBU arose from an idea of stewardship that is a product of CBU's faith-based roots. However, this sense of ethics does not need to come from any particular religious tradition. Colleges and universities of all sorts in both the public and private sectors can develop a similar set of ethics that are derived from secular sources or other faiths. Whatever tradition a campus might have developed out of will undoubtedly have room for a sense of reverence for nature and an understanding that the environment ought to be preserved for future generations.

Likewise, CBU employed a hard-nosed, pragmatic approach to problem-solving that took into account the short- and long-term fiscal implications of green initiatives as well as prioritized green initiatives with all of the other competing interests on campus. Rather than simply jumping at every chance they had to experiment with a new green initiative based solely on a sense of ethical obligation, CBU took a more balanced approach and invested the financial and human resources needed to determine the most appropriate decisions to be made in this regard. By forming committees and hiring individuals with expertise to lead the implementation of these initiatives, CBU employed a range of practical strategies that enabled the university to make decisions that were as informed and as accurate as was feasible. By uniting this sense of ethical responsibility to the environment and society with a pragmatic sense of responsibility to make decisions that are economically sound, colleges and universities worldwide may be better positioned to implement successful green campus practices.

Peering through the Four Frames

The four frames described by Bolman and Deal (2008) can assist educational leaders in their efforts to understand the process of greening a college or university campus. By looking through multiple lenses, a more focused analysis can be developed which can ultimately lead to deeper insights about this process. All four of these frames can help educational leaders in their efforts to facilitate change. The structural frame can assist educational leaders to understand what resources are needed to green a campus, and how to distribute those resources within the organization. This distribution of resources can consist of financial allocations as well as policies and practices that give momentum to campus greening efforts, including decisions to hire staff and faculty to lead the implementation of green initiatives.

The human resource frame can provide a perspective for educational leaders to utilize in their efforts to encourage campus communities to work together toward the common goals involved with campus greening. By forming sustainability committees, campuses can engage faculty, staff, administrators, and students in the process of implementing a comprehensive environmental sustainability initiative. Moreover, by working to facilitate an interdisciplinary and transdisciplinary faculty culture, educational leaders can help to build bridges between academic disciplines so that environmental sustainability may be more effectively addressed.

The political frame can be useful to educational leaders in their efforts to understand a college or university as an organization operating with competing interests and scarce resources. By building this organizational understanding, the process of campus greening can be seen in many ways as an exercise in stakeholder engagement and consensus

building. Furthermore, by securing support from the top down and the bottom up, educational leaders can implement green campus initiatives in ways that will have a higher likelihood for long-term success. Through the engagement of students, staff, faculty, administrators, and others, educational leaders can create a culture around sustainability that can assist in making the transition to green.

The symbolic frame can also be of great assistance to educational leaders looking to push the green agenda forward in higher education. More specifically, the symbolic frame can help educational leaders to create a campus culture around sustainability. This can be achieved in multiple ways. For example, the college or university president can sign the Talloires Declaration or the ACUPCC, declaring publically and symbolically that the campus is dedicated to environmental sustainability. These sorts of top-down declarations and commitments can help the campus community to see the symbolic significance of campus greening efforts. Additionally, educational leaders can harness the power of the symbolic frame by developing and maintaining a green image for the campus. By publicizing success stories and sending consistent messages to the internal and external campus constituencies, a college or university can demonstrate its symbolic commitment to campus greening. However, this commitment cannot be purely symbolic in nature. On the contrary, this symbolism must emanate from, and be grounded in, authentic practice, not just green wash. If a strong approach to sustainability is employed, rather than a weak approach that some participants referred to as "skin deep," then real solutions may be developed to solve economic, social, and environmental problems. By creating a campus culture that values environmental sustainability, educational leaders may be better able to address the critical concerns of the economy,

society, and the environment in ways that complement the educational mission of the institution.

Reconciling Campus Growth and Environmental Impacts

If colleges and universities such as CBU expect to successfully make the transition to green, they will need to reconcile their plans for growth with their plans to reduce environmental impacts. Much like a small municipality, a college or university campus persists in a state of growth. In some cases, growth occurs at a slow pace. In other cases, campus growth is rapid and transformational. In the case of CBU, growth was observed to be occurring at a relatively steady pace, with a Twenty-Year Master Plan in-place that laid the groundwork for much more growth moving into the future. Particularly in cases similar to CBU, where substantial growth is on the horizon, plans for campus sustainability can have a major impact. As campuses acquire more real estate, construct new buildings, renovate old buildings, and increase the campus population size accordingly, there are a number of corresponding environmental impacts associated with this growth. Increasing the consumption of resources translates into increasing environmental pollution and greenhouse gas (GHG) emissions.

Given the current economic climate, as well as declines in human and environmental health, it may be important to ask whether or not colleges and universities should grow at all. On the contrary, perhaps it is the case that institutions of higher education should instead work on scaling-back their impacts instead of growing them. This could take the form of removing old buildings and not constructing new buildings but instead increasing green spaces on campus. On the academic side, the increasing trend of distance learning and online education may provide opportunities to offer more courses without utilizing

physical infrastructure. By offering more online courses and hybrid courses, colleges and universities can have a dramatically less impact on the environment while also addressing the social and economic issues of equal access to educational resources.

By institutionalizing environmental sustainability initiatives in accordance with plans for campus growth, much of the environmental impact can be mitigated. Perhaps the best example of this reconciliation process is the goal of climate neutrality. As campuses make the transition to green, one of the over-arching goals is for campuses to become climate neutral. Reaching this goal entails reducing GHG emissions as much as is feasible and then spending significant funds to mitigate the rest of the damage done. Regardless of how the goal of climate neutrality is approached, reaching this goal takes an investment on the part of educational leaders in terms of finances, climate action planning, or a combination of both. Nonetheless, if climate neutrality is desired, then these issues must be addressed. Thus, colleges and universities can learn from cases such as CBU, and engage in implementing green campus initiatives in ways that will reconcile campus growth with campus greening efforts.

Advancing Education for Sustainability in Higher Education

Colleges and universities can serve as places where people learn about sustainability, both in the classroom as well as through co-curricular and extra-curricular activities. Institutions of higher education can develop models for sustainability that the rest of society may adopt and implement in other settings. By developing and expanding academic degree programs focused on environmental sustainability, campuses like CBU have the potential to provide future leaders with the knowledge and skills needed to address some of the most critical issues of current and future generations.

Moreover, by infusing sustainability across the curriculum and offering opportunities for students to participate in service work and outreach activities, campuses like CBU may be able to reach a broader cross-section of students and have a much more far-reaching impact by increasing the ecoliteracy of their graduates. By training future leaders to value environmental sustainability, educational leaders have the potential to provide students with the heuristic lens needed to effectively initiate and implement these changes in systems of higher education, and the world at large. By educating the world about environmental sustainability, colleges and universities like CBU are, or can be, at the forefront of the transition to green.

Recommendations for Policy and Practice

The findings from this study suggest a number of recommendations for policy and practice. Each of the recommendations provided below have the potential to assist educational leaders in their efforts to improve policies and practices that support campus greening in higher education. By improving policies and practices, educational leaders will increase the likelihood for success in implementing a comprehensive environmental sustainability initiative on a college or university campus.

Encourage the Development of Campus Sustainability Plans on a System-Wide Level

Planning can be a key strategy in implementing green campus initiatives. One recommendation for policy is for colleges and universities to encourage the development of comprehensive sustainability plans on a system-wide or consortium-wide level. During spring 2011, CBU had not been formally encouraged to plan and implement sustainability initiatives from the larger consortium of private, faith-based colleges and universities of which CBU is a member. Had this been the case, it may have provided

CBU with a clearer vision and deeper understanding of how environmental sustainability should be integrated within the organization. By encouraging all of the campuses within a given system or consortium to develop sustainability plans and implement comprehensive environmental sustainability initiatives, a clear message can be sent to individual campuses that articulates the meaning of sustainability within the organization as well as expectations for the implementation of green campus initiatives.

One higher education system of note that has taken a leadership role in having its individual campuses develop sustainability plans is the University of California (UC) system. The UC system implemented a series of formal sustainability policies beginning in 2003. Over the years, the UC system has built upon their policies and in 2009 the policy was officially named the *Policy on Sustainable Practice*. This policy provides detailed guidelines for all 10 UC campuses to follow. In a relatively short amount of time, this top down directive has led to the transition of the UC campuses from traditional campuses to some of the greenest universities in the world. Other higher education systems and consortiums could also benefit from the implementation of similar system-wide policies and resulting practices.

Have Presidents Sign Sustainability Declarations and Commitments

Having CBU's previous president sign the ACUPCC assisted the campus as a whole in furthering their goals for campus sustainability, particularly as they related to climate change. This symbolic act served as a catalyst for change in campus sustainability policies and practices as they related to GHG emissions reductions at CBU. Other campuses could also benefit from having their presidents sign the ACUPCC or other symbolic commitments such as the Talloires Declaration. By signing on to these public

declarations, campuses can communicate their commitment to environmental sustainability to their internal and external stakeholders. This symbolic communication can set the tone at a college or university, and often drive decision making in ways that might not occur without a formal, symbolic commitment articulated from the highest level of authority.

Participate in Campus Sustainability Evaluation and Assessment Programs

The findings from this study indicate that participating in the assessment and evaluation of comprehensive campus sustainability initiatives can greatly assist educational leaders in reaching their green campus goals. There are a number of surveys, green report cards, and other more complex methodologies that can be utilized to assess and evaluate the effectiveness of comprehensive campus sustainability initiatives. The findings from this study indicated that organizations such as the Sustainable Endowments Institute, The Princeton Review, and the National Wildlife Federation offer some of the most widely used campus sustainability assessment and evaluation methodologies. The literature indicates that the AASHE STARS program has emerged as one of the most useful assessment frameworks available for campus sustainability (Bardaglio & Putnam, 2009; Edwards, 2010; Simpson, 2008). By accounting for both the ways in which individual campuses are unique as well as how they are similar with respect to environmental sustainability initiative implementation, assessment and evaluation frameworks such as those mentioned above can be useful tools to track progress and measure relative success.

Invest in Sustainability through Green Revolving Funds

The significance of financing sustainability initiatives was mentioned frequently in the findings from this study as well as in the literature. Even if all of the other obstacles and challenges to green campus initiatives are overcome, the issue of funding can make or break the implementation of a comprehensive environmental sustainability initiative. The literature provides insight into how these initiatives might be funded, citing examples such as Harvard's Revolving Loan program, the University of California's "The Green Initiative Fund" (TGIF) based on student fees, and many other methods of creative financing (Bardaglio & Putnam, 2009; Barlow, 2009). More recently, the Sustainable Endowment Institute released a report entitled, *Greening the Bottom Line: The Trend toward Green Revolving Funds on Campus* (Sustainable Endowments Institute, 2011). This report is the first of its kind to articulate the term "green revolving fund" in the context of financing sustainability in higher education. Green revolving funds (GRFs) are financial mechanisms whereby the savings from energy efficiency and projects that decrease resource consumption are returned to the GRF to be reinvested in similar projects.

As mentioned in the findings from this study as well as in the literature, it can be challenging for educational leaders to make a strong business case for transitioning to green. Implementing a GRF can assist colleges and universities with this challenge by developing a customized way to reinvest money from projects that result in a net savings back into new projects that will also presumably save money. Over time, depending on the site-specific needs of the institution, sustainability initiatives can literally pay for themselves if the right GRF model is applied. Instead of having to search for new

sources of funding every time a new initiative is proposed, an on-going stream of funding can be generated with the sole purpose of paying for the implementation of these new initiatives. At CBU, one example of a GRF was their campus recycling program. Revenues made from the sale of recyclable commodities were appropriated back into the recycling program as operational funds. Financial mechanisms such as GRFs represent the cutting-edge of funding campus sustainability.

Require a Sustainability Course as Part of the Core Curriculum

The findings from this study suggest that part of a comprehensive environmental sustainability initiative on a university campus involves educating students. This study has framed this concept broadly as infusing sustainability across the curriculum. As a more specific recommendation for policy and practice, educational leaders looking to improve eco-literacy on campus might consider working to require a sustainability course as part of the core curriculum. By requiring all students to at least have one class where sustainability is the focus, students from all backgrounds will have the opportunity to relate the significance of sustainability to their own personalized academic work.

Recommendations for Further Study

As a recent area of inquiry, research on implementing environmental sustainability in higher education has much ground to cover. Most of the existing literature is advocacy-based and written in a descriptive form. Although this literature is critically important for articulating the meaning and significance of environmental sustainability in higher education, there is a lack of empirical research to accompany the arguments made by sustainability advocates. Of the relatively few empirical studies that have been conducted, the research topics are fragmented and isolated. Thus, it would be beneficial

for researchers in this broad area to develop a cooperative research agenda that would allow the results of most studies in this research area to be relatable to one another. Many more studies of various sorts would be valuable to educational leaders who are working to green their campuses. More quantitative studies could help to further enumerate the impacts that green initiatives have, while additional qualitative studies could help to further illustrate them. Mixed-method studies could also provide much insight. It would be exceptionally useful to conduct longitudinal studies of multiple campuses to make comparisons over time.

Perhaps the AASHE STARS program will grow into this type of study. If the findings from AASHE STARS submittals grow large enough in terms of sample sizes, and if the STARS program maintains a high participation rate over a long enough period of time, then there could be a strong data set to work with in terms of both quantitative and qualitative analyses. STARS data includes both quantifiable numbers and qualitative text, providing researchers with limitless options for investigation.

However, this breadth of data could be both a blessing and a curse. As the literature review for this study indicates, it is difficult to find consistent threads of knowledge that have emerged from the empirical research done in this area to date. Most of the empirical studies are on narrow topics that have little to no direct relevance to other studies in the same general research area. This disconnection within the literature makes it difficult for educational leaders to formulate plans of action that are well informed.

A broad recommendation for research is that researchers in this area work in cooperative groups as opposed to primarily working independently. By targeting wider research topics collaboratively, researchers would have the opportunity to build more

robust bodies of research. More comprehensive bodies of research could be used to develop increasingly specialized and more effective solutions to some of the most pressing issues pertaining to the economy, society, and the environment.

Research of sustainability in higher education could study all types of higher education institutions; including, both public and private, faith-based and secular, and non-profit and for-profit. Research sites should take the form of community colleges and trade schools as well as small liberal arts colleges and major comprehensive universities. Environmental sustainability initiatives are implemented uniquely at each individual institution. However, there are also many areas of similarity between individual campuses in this respect. By studying the nuances of each type of institution, the larger area of study within higher education will benefit from a diversity of understandings and interpretations.

In terms of specific research questions that could be investigated, there are numerous options to be considered. For example, it would be useful to study the long-term benefits of comprehensive environmental sustainability initiatives on campuses. For example, it would be useful to measure whether or not sustainability education produces beneficial student outcomes either in the short-term, the long-term, or both. Moreover, it would be interesting to investigate the role that universities play in modeling sustainability and influencing practices beyond their borders. Similarly, it would be beneficial to examine the role that external partnerships play in facilitating sustainability practices on college and university campuses.

Findings from all of the types of studies mentioned, as well as many more, would likely be highly useful to educational leaders seeking to green college and university

campuses. As this research continues to inform practice, educational leaders will be better equipped with the knowledge, ideas, and inspiration needed to make the transition to green. As colleges and universities continue to green worldviews and ways of living, this research can provide our institutions of higher education with an increased capacity to lead these efforts and affect change in the world at large. It is this change, on both individual and institutional levels, that could allow the transition to a more sustainable society, enabling current and future generations to thrive.

APPENDICES

APPENDIX A

LETTER OF SUPPORT TO CONDUCT RESEARCH AT [redacted]

[redacted] [redacted]

February 2, 2011

Institutional Review Board
California State University, Long Beach
1250 Bellflower Blvd.
Long Beach, CA 90840

Re: Letter of Support to Conduct Research at [redacted]

Dear Members of the Board:

This letter confirms my approval for Joseph Rasmussen to conduct research at [redacted] in support of his doctoral dissertation entitled: *Implementing a Comprehensive Environmental Sustainability Initiative on a University Campus.*

This qualitative case study will involve interviews with [redacted] administrators, staff, faculty, and students who have been involved with environmental sustainability initiative implementation efforts on campus. Moreover, this case study will involve the review of key documents pertaining to the case as well as direct observations of environmental sustainability initiative implementation efforts being conducted at [redacted]

This research will add to the body of literature that strives to understand how to implement environmental sustainability initiatives in higher education settings. Additionally, this research will assist [redacted] in our on-going program improvement efforts in this area.

Please feel free to contact me if you have any questions or concerns.

Sincerely,

[redacted]

APPENDIX B

INVITATION E-MAIL TO PARTICIPATE IN STUDY WITH CONFIDENTIALITY

Invitation E-mail to Participate in This Study with Confidentiality

Dear _____,

I would like to ask you to participate in an in-person interview in support of my doctoral dissertation research project on environmental sustainability efforts on campus. This project is a qualitative case study on the subject of environmental sustainability initiative implementation in higher education settings. You were selected as a possible participant in this study because you play, or have played, an integral role in environmental sustainability initiative implementation on a university campus.

If you agree to participate in this study, your identity will remain confidential. A pseudonym will be assigned to you so that your identity will remain unknown to anyone except for the researcher.

The interview is expected to last approximately one hour, and can take place in a private location and at a time of your choice. With your consent, I will record the interview for analysis.

Preferably, I would like to schedule this interview with you sometime within the next two weeks. The interview questions are designed to build a better understanding of how environmental sustainability initiatives are implemented on campus. To that end, I am interested in your perspectives and opinions on this subject, and I hope to draw from your extensive knowledge of this topic.

Please respond to this email to let me know if you are willing to participate in this interview. If you agree to participate, I will contact you via phone so that we can arrange a time and location, as well as answer any questions you may have. Thank you for your time and consideration.

Sincerely,

Joseph Rasmussen

[redacted]

APPENDIX C

INVITATION E-MAIL TO PARTICIPATE IN STUDY WITHOUT CONFIDENTIALITY

Invitation E-mail to Participate in this Study without Confidentiality

Dear _____,

I would like to ask you to participate in an in-person interview in support of my doctoral dissertation research project on environmental sustainability efforts on campus. This project is a qualitative case study on the subject of environmental sustainability initiative implementation in higher education settings. You were selected as a possible participant in this study because you play, or have played, an integral role in environmental sustainability initiative implementation on a university campus.

If you agree to participate in this study, your real name will not be utilized. However, your official job title will be utilized and referenced in the study. Thus, there is a risk that your identity could be indirectly determined based on your unique job title. A pseudonym will be assigned to you so that your real name will remain as confidential as is possible.

The interview is expected to last approximately one hour, and can take place in a private location and at a time of your choice. With your consent, I will record the interview for analysis.

Preferably, I would like to schedule this interview with you sometime within the next two weeks. The interview questions are designed to build a better understanding of how environmental sustainability initiatives are implemented on campus. To that end, I am interested in your perspectives and opinions on this subject, and I hope to draw from your extensive knowledge of this topic.

Please respond to this email to let me know if you are willing to participate in this interview. If you agree to participate, I will contact you via phone so that we can arrange a time and location, as well as answer any questions you may have. Thank you for your time and consideration.

Sincerely,

Joseph Rasmussen

APPENDIX D

PHONE CALL SCRIPT TO PARTICIPATE IN THIS STUDY

Phone Call Script to Participate in This Study

[Note: Initial contact will be made via e-mail. A phone call will be made as a follow-up to the e-mail in Appendix B for all potential participants. For potential participants who respond to the initial e-mail, scheduled phone call times will be set via e-mail. For potential participants who do not respond to the initial e-mail within exactly three days, this phone call will be made as an, unscheduled phone call. Voice mail messages will be left if the phone is not answered, and one additional follow-up phone call will be made if the message is not returned.]

"Hello. This is Joseph Rasmussen, the Campus Sustainability Coordinator here at [redacted]. I am calling you today to follow-up on an e-mail that I sent a few days ago asking if you would be interested in participating in a qualitative case study about environmental sustainability initiative implementation here at [redacted]. This study is part of my doctoral dissertation through California State University, Long Beach. Your participation would involve completing a brief demographic questionnaire, an interview that would last approximately one hour as well as some brief follow-up conversations to discuss the results of the study. Would you like to participate in this study?"

A. If the potential participant does not agree to participate, I will state the

following: "I understand. Thank you so much for your time."

B. If the potential participant agrees to participate, I will state the following:

"Great! Thank you. I will e-mail you an informed consent form and a link to the on-line demographic questionnaire. It would be great if you could complete these prior to the interview."

[Note: Participants will be assigned by the researcher into two distinct categories, a "confidential" group and a "non-confidential" group. Depending on which category a participant is in, I will state the following]

A. When speaking with potential participants in the "confidential" group, I will state the following:

"Excellent. I will e-mail you the informed consent form for the "confidential" group. I look forward to the interview. Thank you. Do you have any further questions for me?"

B. When speaking with potential participants in the "non-confidential" group, I will state the following:

"Excellent. I will e-mail you the informed consent form for the "non-confidential" group. I look forward to the interview. Thank you. Do you have any further questions for me?"

A. If the potential participant has further questions, I will answer them to the best of my ability, or outline a plan with them for finding the answers to their questions. After this discussion is over, I will state the following:

"Ok. Well, thanks again for your cooperation, and I will see you at the interview."

B. If the potential participant does not have further questions, I will state the following: "Ok. Well, thanks again for your cooperation, and I will see you at the interview."

APPENDIX E

FOLLOW-UP E-MAIL TO PARTICIPANT WITH INFORMED CONSENT FORM AND DEMOGRAPHIC QUESTIONNAIRE

Follow-up E-mail to Participant with Informed Consent Form and Demographic Questionnaire Attached

Dear _____:

Thank you for agreeing to participate in this study. The Informed Consent Form that we agreed you would complete is attached to this e-mail. Please review the form carefully. If you have any questions, feel free to e-mail or call me in advance, or we can discuss your questions prior to beginning the interview. If you are comfortable with the form and have no questions, please print two copies of this form, sign each of them, and bring both of them with you on the day of the interview.

Also, the Demographic Questionnaire is attached to this e-mail. This brief survey should only take you a few minutes to complete. Please complete the Demographic Questionnaire before the interview, and I will collect it from you after I collect the signed Informed Consent Form from you. If you do not bring the Demographic Questionnaire with you to the interview, I will have a blank copy for you to complete before the interview begins.

I really appreciate your participation in this study. Please let me know if you have any questions or concerns.

Thank you,

Joseph Rasmussen

APPENDIX F

DEMOGRAPHIC QUESTIONNAIRE

Demographic Questionnaire

1. Age Range: (Choose One)

- 18 - 24
- 25 - 40
- 41 - 56
- 57 - 72
- 73+

2. Sex: (choose one)

- M
- F

3. Race: (check one box or fill-in "other" field)

- African-American
- Asian Caucasian Hispanic
- Native-American
- Other (please specify)

4. Campus Role: (Choose one)

- Administrator
- Faculty Staff Student

5. Number of Years Associated with Campus: (choose one)

- 0 - 2 years
- 2 - 5 years
- 5 - 10 years
- 10 - 15 years
- 15 - 20 years
- 20+ years

APPENDIX G

INFORMED CONSENT FORM, CONFIDENTIAL GROUP OF PARTICIPANTS

Informed Consent Form for Confidential Group of Participants

Consent to Participate in Research

Title of study:

Implementing a Comprehensive Environmental Sustainability Initiative on a University Campus

Participant Identities Will Remain Confidential

You are asked to participate in a research study conducted by Joseph Rasmussen, from the Ed.D. in Educational Leadership Department at California State University, Long Beach (CSULB). The results of this study will be contributed to his doctoral dissertation which is a qualitative case study of a university campus. The study is overseen by a dissertation committee comprised of two other faculty members.

You were selected as a possible participant in this study because you play, or have played, an integral role in environmental sustainability initiative implementation on a university campus.

If you agree to participate in this study, your identity will remain confidential. A pseudonym will be assigned to you so that your identity will remain unknown to anyone except for the researcher.

All hard copy raw data resulting from your participation will be stored in a locked file cabinet in a private residence. All electronic data will be stored on a password protected computer and backed-up on a password protected server hosted by Dropbox.com.

Purpose of the Study

The purpose of this study is to add to our understanding of how an institution of higher education implements a comprehensive environmental sustainability initiative. There is a growing movement on college and university campuses, both nationally and internationally, toward environmental sustainability. Although much theoretical and descriptive literature has been written that articulates the context of environmental sustainability and describes the practices of sustainability in higher education specifically, there is a lack of research that strives to understand the process of how environmental sustainability initiatives are implemented on college and university campuses.

Procedures

If you volunteer to participate in this study, you will do the following things:

Step 1: Demographic Questionnaire

You will complete a brief demographic questionnaire. This should take only a few minutes to complete.

Step 2: Interview

You will participate in an interview for approximately 60-minutues. You and I will agree on a suitable pseudonym to utilize during the interview to keep your real name confidential. The interview will be digitally recorded for data analysis with your permission. I will take hand-written notes if you wish to participate but do not want to be audio taped.

Step 3: Follow-up

I will send you the interview transcript as well as my initial interpretations of how your comments relate to the study via e-mail. I will give you one week to respond, after which time I will move forward with my research process if I don't hear from you.

Potential Risks and Discomforts

While no research is without risk, participation in this study presents minimal risk to you. Some of the interview content may be of a sensitive nature in terms of internal campus politics or other issues of concern. Somebody could access the raw interview transcription data and connect statements made back to you. However, I will ensure that your identity is not revealed by using a pseudonym throughout the research process. Furthermore, I will not provide information in quotes that could reveal your identity. You will have the right to refuse to answer any question that you find sensitive,
and you may also withdraw from the study completely if you find it upsetting.

Potential Benefits to Participants

As a participant in this study, you may benefit from the interview by learning from your own articulations of answers to the questions as you think through the answers out loud. This process may assist you in solidifying some of your own views, ideas, and thoughts about the subject matter.

Potential Benefits to Society

This study will add to the body of literature on environmental sustainability initiative implementation in a higher education setting. A minimal amount of research on this subject has been done in the past. Thus, this study will provide a meaningful contribution to an academic discipline that is in great need of empirical inquiry.

Confidentiality

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law.

The interview conducted with you will be recorded utilizing a digital audio recording device. The digital files will be kept confidential with the original electronic files stored on a password protected computer in a locked office as well as copies backed up on a password protected server hosted by Dropbox.com. Hard copy transcriptions of the interview audio will be stored in a locked file cabinet. Electronic copies of the transcriptions will be stored on a password protected computer in a locked office as well as backup copies stored on a password protected server hosted by Dropbox.com.

As a participant in this study, you will have the right to listen to and/or read the interview raw data. This raw data will be saved for three years and then all hard copy and electronic data will be destroyed. All professional transcribing services will be required to destroy all files associated with your interview immediately after delivering complete copies of the data to the researcher. I will destroy the audio files after transcriptions have been received by myself and thoroughly checked for any errors.

Participation and Withdrawal

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. Participation or non-participation will not affect any personal consideration or right you usually expect. You may also refuse to answer any questions you don't want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which in the opinion of the researcher warrant doing so.

Identification of Investigators

If you have any questions or concerns about the research, please feel free to contact Joseph Rasmussen, Principal Investigator, at [redacted], or Dr. Don Haviland, Faculty Advisor, at (562) 985-2553.

Rights of Research Subjects

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. If you have questions regarding your rights as a research subject, contact the Office of University Research, CSU Long Beach, 1250 Bellflower Blvd., Long Beach, CA 90840; Telephone: (562) 985-5314 or email to research@csulb.edu.

SIGNATURE OF RESEARCH PARTICIPANT

I understand the procedures and conditions of my participation described above. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

Name of Participant:_____

Signature of Participant:_____

Date:_____

Consent for Audio Recording

My signature below indicates that I agree to allow an audio recording made of my interviews.

Name of Participant:_____

Signature of Participant:_____

Date:_____

Statement and Signature of Investigator

In my judgment the subject is voluntarily and knowingly giving informed consent and possesses the legal capacity to give informed consent to participate in this research study.

Signature of Investigator:_____

Date:_____

APPENDIX H

INFORMED CONSENT FORM, NON-CONFIDENTIAL GROUP OF PARTICIPANTS

Informed Consent Form for Non-Confidential Group of Participants

Consent to Participate in Research

Title of study:

Implementing a Comprehensive Environmental Sustainability Initiative on a University Campus

Participant Identities Will Not Remain Confidential

You are asked to participate in a research study conducted by Joseph Rasmussen, from the Ed.D. in Educational Leadership Department at California State University, Long Beach (CSULB). The results of this study will be contributed to his doctoral dissertation which is a qualitative case study of a university campus. The study is overseen by a dissertation committee comprised of two other faculty members.

You were selected as a possible participant in this study because you play, or have played, an integral role in environmental sustainability initiative implementation on a university campus.

If you agree to participate in this study, your real name will not be utilized. However, your official job title will be utilized and referenced in the study. Thus, there is a risk that your identity could be indirectly determined based on your unique job title. A pseudonym will be assigned to you so that your real name will remain as confidential as is possible.

All hard copy raw data resulting from your participation will be stored in a locked file cabinet in a locked residence. All electronic data will be stored on a password protected computer and backed-up on a password protected server hosted by Dropbox.com.

Purpose of the Study

The purpose of this study is to add to our understanding of how an institution of higher education implements a comprehensive environmental sustainability initiative. There is a growing movement on college and university campuses, both nationally and internationally, toward environmental sustainability. Although much theoretical and descriptive literature has been written that articulates the context of environmental sustainability and describes the practices of sustainability in higher education specifically, there is a lack of research that strives to understand the process of how
environmental sustainability initiatives are implemented on college and university campuses.

Procedures

If you volunteer to participate in this study, you will do the following things:

Step 1: Demographic Questionnaire

You will complete a brief demographic questionnaire. This should take only a few minutes to complete.

Step 2: Interview

You will participate in an interview for approximately 60-minutues. You and I will agree on a suitable pseudonym to utilize during the interview to keep your real name confidential. However, your official job title will be utilized. The interview will be recorded for data analysis. The interview will be digitally recorded for data analysis with your permission. I will take hand-written notes if you wish to participate but do not want to be audio taped.

Step 3: Follow-up

I will send you the interview transcript as well as my initial interpretations of how your comments relate to the study via e-mail. I will give you one week to respond, after which time I will move forward with my research process if I don't hear from you.

Potential Risks and Discomforts

While no research is without risk, participation in this study presents minimal risk to you. Some of the interview content may be of a sensitive nature in terms of internal campus politics or other issues of concern. Somebody could access the raw interview transcription data and connect statements made back to you. A pseudonym will be used instead of your real name in order to promote the highest level of confidentiality possible. However, your official job title will be used. I will remind you that your official job title will be used during the interview and throughout the study, which should prompt you to speak in ways that will hopefully avoid any potential conflict or discomfort. You will have the right to refuse to answer any question that you find sensitive, and you may also withdraw from the study completely if you find it upsetting.

Potential Benefits to Participants

As a participant in this study, you may benefit from the interview by learning from your own articulations of answers to the questions as you think through the answers out loud. This process may assist you in solidifying some of your own views, ideas, and thoughts about the subject matter.

Potential Benefits to Society

This study will add to the body of literature on environmental sustainability initiative implementation in a higher education setting. A minimal amount of research on this subject has been done in the past. Thus, this study will provide a meaningful contribution to an academic discipline that is in great need of empirical inquiry.

Confidentiality

Your identity will not remain completely confidential in this study. By signing this form, you agree to allow your official job to be utilized in, and in reference to, this study. Your real name will not be used. Instead, a pseudonym will be used to conceal your identity to the highest degree possible. The interview conducted with you will be recorded utilizing a digital audio recording device. The original electronic files will be stored on a password protected computer in a locked office as well as copies backed up on a password protected server hosted by Dropbox.com. Hard copy transcriptions of the interview audio will be stored in a locked file cabinet. Electronic copies of the transcriptions will be stored on a password protected computer

in a locked office as well as backup copies stored on a password protected server hosted by Dropbox.com.

As a participant in this study, you will have the right to listen to and/or read the interview raw data. This raw data will be saved for three years and then all hard copy and electronic data will be destroyed. All professional transcribing services will be required to destroy all files associated with your interview immediately after delivering complete copies of the data to the researcher. I will destroy the audio files after transcriptions have been received by myself and thoroughly checked for any errors.

Participation and Withdrawal

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. Participation or non-participation will not affect any personal consideration or right you usually expect. You may also refuse to answer any questions you don't want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which in the opinion of the researcher warrant doing so.

Identification of Investigators

If you have any questions or concerns about the research, please feel free to contact Joseph Rasmussen, Principal Investigator, at [redacted], or Dr. Don Haviland, Faculty Advisor, at (562) 985-2553.

Rights of Research Subjects

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. If you have questions regarding your rights as a research subject, contact the Office of University Research, CSU Long Beach, 1250 Bellflower Blvd., Long Beach, CA 90840; Telephone: (562) 985-5314 or email to research@csulb.edu.

SIGNATURE OF RESEARCH PARTICIPANT

I understand the procedures and conditions of my participation described above. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

Name of Participant:_____

Signature of Participant:_____

Date:_____

Consent for Audio Recording

My signature below indicates that I agree to allow an audio recording made of my interviews.

Name of Participant:_____

Signature of Participant:_____

Date:_____

Statement and Signature of Investigator

In my judgment the subject is voluntarily and knowingly giving informed consent and possesses the legal capacity to give informed consent to participate in this research study.

Signature of Investigator:_____

Date:_____

APPENDIX I

INTERVIEW PROTOCOL

Interview Protocol:

Implementing a Comprehensive Environmental Sustainability Initiative on a University Campus

1) What does 'environmental sustainability' in a university setting mean to you? What does it look like in practice?

2) How well do you think this campus is performing in terms of environmental sustainability? Optional Probe: Would you consider CBU to be a "green" campus? Why or why not?

3) Is there a particular feature, asset, or program of our campus that stands out to you as being a strong example of environmental sustainability? Why?

4) Is there anything that you think CBU needs to do in order to improve our environmental sustainability efforts? What can we do better?

5) Given what you know about CBU's environmental sustainability efforts, what strategies have you seen that successfully facilitate these efforts? What makes these strategies work effectively?

6) Who would you say are the key individuals or stakeholders on campus that are involved with implementing environmental sustainability initiatives?
   a. Is there anyone who is not working on these initiatives that you believe should be?

7) What do you think are the main obstacles and/or challenges to implementing a comprehensive, environmental sustainability initiative on campus?
   a. What ideas do you have about how to overcome these obstacles and/or challenges?

8) As you know, every institution has limited financial resources to invest in sustainability programs. What do you think are the most important environmental sustainability programs for CBU to invest financial resources in? Why?

9) Is there anything I didn't ask that you would like me to know?

APPENDIX J

DISSERTATION CHAIR LETTER OF SUPPORT

Dissertation Chair Letter of Support

TO: Institutional Review Board for the Protection of Human Subjects

FROM: Don Haviland, EdD Program
562-985-2553 or dhavilan@csulb.edu

NAME OF STUDENT: Joe Rasmussen

TITLE OF THESIS OR PROJECT: Implementing a Comprehensive Environmental Sustainability Initiative on a University Campus

As Joe Rasmussen's dissertation chair, I am pleased to write this letter of support for the above proposed study.

As Joe's application notes, the risks to participants in this study are minimal. As with all studies, there is the possibility that someone might utter a negative or controversial that, should it be traced to them, could strain their relationship with colleagues or cause embarrassment. Similarly, there is some small chance that participants might begin to feel uncomfortable since the subject of sustainability can sometimes have political implications.

Joe is undertaking efforts to control and protect against these risks. To address the first risk, he is masking names with pseudonyms (only he will have access to actual names), reporting data at a general level (i.e., providing only necessary information at a general level so readers are unlikely to be able to link a quote to a specific individual), and managing the data collection and transcription processes to ensure that sensitive data is secure and deleted as quickly as possible. To address the second risk, Joe will make sure that he reminds participants they can skip any question they wish and/or withdraw from the study at any time, as well as consciously create a safe and open (i.e. non-judgmental) space for the conversation to take place.

There is one important exception to the use of pseudonyms and confidentiality in Joe's study. In a handful of cases as outlined in Joe's IRB proposal (e.g., the university president), individuals will not be promised confidentiality. This is because, in these cases, the individuals are likely to have unique information that might well be difficult to obscure or discuss in a general way so as to hide their identities. Moreover, given these leaders' central role in shaping campus initiatives, it may be important to the credibility of the study for Joe to be able to attribute ideas and words directly to them. We have consulted with the Director of Research Compliance, who has concurred in this matter. As a result, Joe has drafted a separated consent form for these individuals to ensure they are fully aware of what their participation in the study will mean.

The push for sustainability in higher education (and elsewhere) is real. However, as Joe's literature review has shown, much of the research in this area to date is anecdotal and/or focused on what the actual practice of sustainability looks like (e.g., changes in curriculum, recycling programs). Joe's study promises to make an important contribution by looking at the implementation of sustainability as an *example of intentional change*. His work will therefore address not just the nuts and bolts of

sustainability, but help scholars and practitioners see how to go about implementing sustainability efforts.

I have worked with Joe as his advisor and dissertation chair for more than two year now and have great regard for his skills, intellect, and professionalism. I am confident that his proposal reflects high standards for the respect and dignity of all research participants and that he has the skills and character necessary to conduct research with integrity.

My signature below certifies that I as Faculty Sponsor of this research have read and approve the attached application.

2/1/11

Research Supervisor Signature and Date

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