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An Assessment of Environmental Sustainability Guidelines at Community and Junior College Campuses in Mississippi

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An assessment of environmental sustainability guidelines at community and junior
college campuses in Mississippi

By

Suzanne D. Strehle

A Dissertation
Submitted to the Faculty of
Mississippi State University
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy
in Community College Leadership
in the Department of Leadership and Foundations

Mississippi State, Mississippi

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An assessment of environmental sustainability guidelines at community and junior
college campuses in Mississippi

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The purpose of this study was to review the established sustainability guidelines in place at each of the 15 public community and junior colleges in Mississippi and to illuminate the ways in which these community colleges interacted with environmental sustainability during the 2013-2014 academic year. Dimensions studied within the established guidelines included curriculum, research and scholarship, operations, faculty and staff development, outreach and service, student opportunities, and administration, mission, and planning. This research study was qualitative in nature and utilized a multiple case holistic design. Sustainability guideline documents, informant commentary, college policy documents, and college course catalogs were gathered from 6 of the 15 community colleges in Mississippi and used to prepare a descriptive analysis of the results.

The results of this studied showed the following: a) only a portion of the reporting community colleges discuss sustainability topics in courses on campus, b) none of the colleges reported having sustainability guidelines related to research and scholarship, c) all colleges reported having sustainability guidelines and efforts in the area of operations,

d) a small number of the reporting colleges noted having faculty and staff development concerning sustainability guidelines on campus, e) half of the reporting colleges noted that sustainability guidelines are incorporated into outreach and service, f) a small number of reporting colleges stated that sustainability guidelines and efforts are incorporated into student opportunities, g) half of all reporting colleges noted that sustainability guidelines are utilized in the area of administration, mission, and planning. Recommendations for further research are discussed.

DEDICATION

This dissertation is dedicated to my mother, Elizabeth, my husband, Adam, and my son, Walt. Thank you all for your unconditional love, support, patience, understanding, and sacrifice as I have worked to finish this project.

ACKNOWLEDGEMENTS

I would like to express my sincere appreciation to Dr. Dan Stumpf for serving as my dissertation chair. Dr. Stumpf's guidance and unique instruction has continued to influence me throughout this program. I would also like to express my gratitude to Dr. Ed Davis, Dr. Stephanie King, and Dr. Marty Wiseman for serving on my committee and for providing support and encouragement throughout this program. To my colleagues in the Community College Leadership program, the shared experience of this program has been both challenging and rewarding. Many of you have been instrumental in my success in both this program and in my career and, for that, I am grateful. To my dear friend, Dr. Janéa Jenkins, I can't thank you enough for your constant motivation, support, and words of encouragement. To my beloved teacher and friend, Joan Smith, I will never be able to truly express the gratitude I have for you in helping to instill in me a passion for research and writing at an early age. You have given me a lifelong gift.

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CHAPTER I

INTRODUCTION

The threat of global warming and ecosystem degradation has prompted a transition to low-carbon usage and the desire to create a more sustainable society. Feldbaum and States (2008) assert that a sustainable society is one that is environmentally sound, socially just, and economically viable. In recent years, higher education institutions have been contemplating how to educate and equip students with the necessary skills and knowledge to lead the nation in transitioning to a low-carbon society. Community colleges are in a prime position to promote preventive actions to lessen climate change, encourage building of a sustainable society, and develop a workforce that will be prepared for jobs in the green energy sector (Feldbaum & States, 2008). By educating future generations about sustainability, college graduates will better understand the interaction between economic, environmental, and social forces leading them to be prepared to deal with problems of global warming, biodiversity loss, overpopulation, and limited food and water resources (Association for the Advancement of Sustainability in Higher Education, 2010).

Across the nation, community colleges are choosing to become part of the solution to global warming by signing the American College and University Presidents Climate Commitment. This commitment is a pledge taken by each college to work toward climate neutrality (Association for the Advancement of Sustainability in Higher

Education, 2010; Feldbaum & States, 2008). The American College and University Presidents Climate Commitment's website defines climate neutrality as "having no net greenhouse gas (GHG) emissions, to be achieved by eliminating net GHG emissions, or by minimizing GHG emissions as much as possible, and using carbon offsets or other measures to mitigate the remaining emissions" (para. 22). This pledge to develop a plan for sustainability efforts on campuses has led colleges to incorporate such thinking into campus operations, administration, development or enhancement of curricula, research and scholarship, faculty and staff development, research, student opportunities, and community outreach and service (Feldbaum & States, 2008).

Despite the economic recession in the United States, the demand for products and services that conserve energy and natural resources has continued to grow at local, national, and international levels (Stone, 2010). In order to execute the production of such products, employers are in need of properly trained employees. A report published by the American Solar Energy Society revealed that jobs in the renewable energy and energy efficiency sector spawned 8.5 million jobs in 2006 (Feldbaum & States, 2008; Gordon & Hays, 2008). Community colleges are in an ideal position to implement such green energy educational and training programs due to their ongoing relationship with area employers. Accessibility, low cost of tuition, and the multitude of training and educational opportunities are also inviting characteristics for students interested in these programs (Bozell & Liston, 2010). Gordon and Hays (2008), along with Bozell and Liston (2010), note that jobs created by the green energy economic sector will be termed middle-skill jobs and should allow the individual to support a family. These jobs will

also require educational attainment higher than a high school diploma but less than a baccalaureate degree.

Colleges across the nation have already established such programs. Lane Community College in Oregon developed their preliminary Energy Management Program in the 1980's and has expanded to offer degrees in energy management, renewable energy, and water conservation. Also in Oregon, Colombia Gorge Community College offers one of the few wind energy technology programs in the United States (Bradley, 2010). Cape Cod Community College in Massachusetts has an environmental technology program that provides training to individuals in the areas of wind turbine maintenance and solar energy technologies. Other colleges, such as Columbus State Community College in Ohio, are retraining skilled workers for jobs in sustainable or green energy areas. Columbus State Community College offers a sustainable construction certificate for workers already working in architecture and construction fields (Cowan & Evelyn, 2007).

Colleges implementing such educational programs are also incorporating sustainability efforts into campus operations and other areas as well. Mount Waschuset Community College in Massachusetts moved towards reducing its greenhouse gas emissions by implementing a heating system fueled by wood chips instead of electricity. This action saved the college 2.93 million dollars and reduced the college's carbon footprint by 22.5%. Wake Technical Community College in North Carolina serves as a laboratory setting for the college's construction management associate degree program. Students are able to learn about both conventional and sustainable building methods and materials (Feldbaum & States, 2008). In Missouri, Crowder College has constructed the

Missouri Alternative and Renewable Energy Technology (MARET) Center. This facility incorporates several types of renewable energy sources in its construction. The MARET Center serves as an educational facility, research laboratory, and an economic development entity within the community (McCrea, 2012).

In Mississippi, green energy technologies are used in many industries with a desire to implement more throughout the state. The Mississippi Energy & Industrial Construction Consortium (2009) defines green energy technologies as “products, methods, and practices that reduce environmental impact of energy generation, production, distribution, transportation, or consumption” (p. 3). Currently in Mississippi, biomass initiatives, which involve converting biological materials into forms of energy, are underway. These biomass research projects hope to develop alternative energy solutions so that our nation might reduce its dependence on foreign oil (Mississippi Energy & Industrial Construction Consortium, 2009). Mississippi does not utilize wind and solar energies as much as other areas of the country. However, SmartSync located in Jackson, Mississippi, produces an item known as a smart grid, which allows for the integration of wind and solar power into the nation’s electrical grid. This company is considered to be the largest provider of such devices in North America (Mississippi Energy & Industrial Construction Consortium, 2009).

In response to threats of global warming and ecosystem degradation, sustainability efforts have been implemented on many college campuses across the nation. As the concern for developing sustainable societies grows, the need for educating and aiding individuals in developing real-world problem solving skills will become more important. This study examined sustainability guidelines in place at each of the 15

Mississippi community and junior colleges. Dimensions studied included curriculum, research and scholarship, operations, faculty and staff development, outreach and service, student opportunities, and administration, mission, and planning.

Statement of the Problem

The problem addressed in this study was the description of established sustainability guidelines in place at each of the 15 community and junior colleges in Mississippi.

Purpose of the Study

The purpose of this study was to review the established sustainability guidelines in place at each of the 15 public community and junior colleges in Mississippi and to illuminate the ways in which these community colleges interacted with environmental sustainability during the 2013-2014 academic year. Dimensions studied within the established guidelines included curriculum, research and scholarship, operations, faculty and staff development, outreach and service, student opportunities, and administration, mission, and planning.

Research Questions

The following research questions were answered in order to meet the purpose of the study:

1. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of curricula?
2. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of research and scholarship?

3. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of operations?
4. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of faculty and staff development?
5. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of outreach and service?
6. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of student opportunities?
7. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of administration, mission, and planning?

Significance of the Study

Presidents, vice presidents, facilities or operations directors, and other community college officials may use this research to examine the sustainability guidelines in place at each of the community and junior college campuses within Mississippi. This will give such officials the opportunity to compare sustainability efforts at their respective college to those throughout the state. This study provides a basis for future research by illuminating the ways that Mississippi junior and community colleges are interacting with environmental sustainability and will provide assistance to presidents, vice presidents, facilities or operations directors, and other officials within the Mississippi community college system in further integrating sustainability guidelines in the areas of curriculum, research and scholarship, operations, faculty and staff development, outreach and service, student opportunities, and administration, mission, and planning.

Delimitations of the Study

The researcher recognized the following delimitations of the study.

1. The study consisted of 15 public community and junior colleges in the state of Mississippi.
2. The study concentrated on data obtained from the 2013-2014 academic year.
3. The data gathered in this study will be generalized to the 15 public community and junior colleges within Mississippi and may not be generalized to public community and junior colleges in other areas of the United States.

Limitations of the Study

The researcher acknowledged the following limitations of the study:

1. The data gathered in this study from the sustainability guidelines were limited by dimensions described within the guidelines.

Definition of Terms

The following terms are defined for the purpose of this study:

1. Biomass involves converting biological materials such as food crops, livestock and food processing waste into energy (Mississippi Energy & Industrial Construction Consortium, 2009).
2. Climate neutrality refers to having no net GHG emissions, to be achieved by eliminating net GHG emissions, or by minimizing GHG emissions as much as possible, and using carbon offsets or other measures to mitigate

the remaining emissions (American College and University Presidents Climate Commitment, 2013).

3. Ecosystem degradation is a process which will eventually lead to the collapse of the ecosystem. The degradation process reduces the capacity of the ecosystem to buffer the impacts of climate change (United Nations Environment Programme, 2009).
4. Global warming refers to the increase in the Earth's average surface temperature due to rising levels of greenhouse gases (Conway, 2008).
5. Green energy comes from natural sources such as sunlight, wind, rain, tides, plants, algae, and geothermal heat (Rogers, 2012).
6. Green energy sector can be conceived as being composed of activities related to efforts to clean the air and water, manage waste products, promote conservation, and enhance the environment (Ong & Patraporn, 2006).
7. Green energy technologies are products, methods, and practices that reduce the environmental impact of energy generation, production, distribution, transportation, or consumption (Mississippi Energy & Industrial Construction Consortium, 2009).
8. Green job applies to jobs that help to protect ecosystems and biodiversity; reduce energy, materials, carbon and water consumption through high efficiency strategies; and minimize or altogether avoid generation of all forms of waste and pollution (National Association of State Directors of Career Technical Education Consortium, 2010).

9. Greenhouse gas refers to any gas that absorbs infrared radiation in the atmosphere. Such gases include carbon dioxide, methane, nitrous oxide, ozone, chlorofluorocarbons, hydrochlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride (United States Environmental Protection Agency, 2013).
10. Renewable energy encompasses energy resources that are naturally replenishing such as biomass, hydro, geothermal, solar, wind, ocean thermal, wave action, and tidal action (United States Environmental Protection Agency, 2013).
11. Sustainability refers to the long-term, responsible management of environmental, societal and business resource use (National Association of State Directors of Career Technical Education Consortium, 2010).
12. Sustainable development is an approach to development that meets the needs of the present in such a way that future generations can also meet their own needs (National Association of State Directors of Career Technical Education Consortium, 2010).
13. Sustainable practices are those practices that will positively transform the campus community through productive environmental action (Walla Walla Community College, 2009).
14. Sustainable society refers to a society that incorporates values, systems, and activities that are environmentally sound, socially just, and economically viable (Feldbaum & States, 2008).

CHAPTER II

REVIEW OF THE RELATED LITERATURE

Introduction

In Mississippi, community and junior colleges serve to provide quality educational and workforce training opportunities while ensuring affordable tuition so that more individuals have the possibility to better themselves. As with any higher education institution, community and junior colleges seek to create problem solvers who will leave college prepared to face the challenges in society and in the workplace. Integrating sustainability into all aspects of the college setting complements the mission of preparing students to tackle real-world issues. In order to accomplish this, sustainability efforts on campuses are not only focused on integration or enhancement of curricula, but also integration into areas of campus operations, administration, research and scholarship, faculty and staff development, research, student opportunities, and community outreach and service.

The researcher examined literature related to the concern humans show towards environmental threats. This was followed by a brief discussion on the evolution of sustainability in the United States and its current place in today's society. Finally, the researcher reviewed literature concerning sustainability on college campuses. This included the integration of sustainability on campus in the areas of curriculum and job

training, research and scholarship, operations, faculty and staff development and rewards, outreach and service, student opportunities, and administration, mission, and planning.

Sustainability and Environmental Concern

Sustainability and environmental concern are interconnected ideas that are best explained by the value-belief-norm (VBN) theory of environmentalism developed by Stern (2000). This theory suggests that individuals' personal norms influence their decision to make positive actions towards the environment. These personal norms are founded in an individual's belief that certain environmental conditions can potentially threaten things of value and that the individual has the capacity to change or minimize the threat. The VBN theory of environmentalism is rooted in Schwartz's (1973,1977) moral norm-activation theory of altruism (as cited in Stern, 2000). Schwartz's theory suggests that personal moral norms are shaped by threatening conditions which could pose harm to others. These personal moral norms, in turn, influence the actions of individuals and result in actions that will decrease the likelihood of harm to others (Stern, 2000).

Evolution of Sustainability

Forms of sustainability appeared in the earliest populations of people through many rituals that were rooted in religious beliefs or magical practices. Many of these rituals involved sacrifices or praises that were believed to benefit the environment and to protect one's own welfare. More recently, environmental and social movements of the 1960s brought the philosophy of sustainability to the forefront. Estes (1993) notes that there are nine worldwide movements that formed the 1992 United Nations Conference on the Environment and Development (UNCED). These movements included:

1) the *early environmental and human ecology movements* of Europe and North America; 2) the *anti-war and anti-nuclear movements* of Europe and North America; 3) the “*world order*” movement; 4) the “*world dynamics modeling*” movement; 5) the European “*green*” movement; 6) the “*alternative economics*” movement; 7) the *women’s movement* in North America and Europe and, more recently, in Latin America; 8) the *indigenous peoples movements* in Latin America, Asia, and selected areas of the Pacific; and 9) the worldwide *human rights movement* (p. 4-5).

The early environmental and human ecology movements of Europe and North America shed light on the immense amount of damage being done to the environment, focusing especially on the over use of pesticides and herbicides. This movement also stressed the potential impact of overpopulation on the environment and suggested a need for better balance between economic policies and environmental policies. In the same geographical regions, there were also anti-war and anti-nuclear movements occurring. These movements exposed the negative impact of power and disproportionate resources between wealthy and poverty-stricken countries (Estes, 1993).

The “world order” movement was inspired by a small group of individuals from international law and world parliamentarian movements. This movement suggested, by the end of the century, improvements of world order could be accomplished and provided tactics for making such improvements. The “world dynamics modeling” movement seems to have been built on the ideals of previously mentioned movements. The Club of Rome was responsible for the commencement of this movement. The “world dynamics modeling” movement stressed the importance of environmental limits and Earth’s

carrying capacity when developing economic and environmental policies. Similar to the anti-war and anti-nuclear movements, this movement once again expressed the negative impact of disproportionate resources and social inequalities between wealthy and poverty-stricken countries (Estes, 1993).

In Europe, the “green” movement called for the formation of new development paradigms. The new development paradigms would provide a more realistic image of the costs to the environment resulting from rapid development. This movement also stressed the need for improved environmental policies and peace. In a larger attempt to rectify economic policies affecting the environment, the “alternative economics” movement presented alternative economic systems that would replace systems that made decisions resulting only in short term economic benefits, and consequently, long term damage to the environment. This movement pushed for the redistribution of the world’s resources so that rich and poor countries had more equivalent resources (Estes, 1993).

The indigenous peoples movement involved different groups of people worldwide. These groups, however, had common goals. Obtaining lands and resources that once belonged to the indigenous people and increasing their protection by the governing systems in their area were two of the main concerns of this movement. The final concern was to encourage a better understanding of the earth-centered values and practices of these groups (Estes, 1993).

At one time, men and women worldwide did not possess the same social, political, economic, and legal rights. The women’s movement encompassed groups of women around the world who desired to have the same rights as men. The movement also expressed environmental concerns that affected women. Finally, the human rights

movement emphasized the United Nations *Universal Declaration of Human Rights* and the importance of executing the protection of civil rights and political freedoms as presented in this document (Estes, 1993).

Along with the movements mentioned previously, the World Commission on Environment and Development, also known as the Brundtland Commission, is widely acknowledged for developing the concept of “sustainable development.” The Commission defined “sustainable development” as “paths of human progress which meet the needs and aspirations of the present generation without compromising the ability of future generations to meet their needs” (Estes, 1993, p. 1). The Brundtland Commission’s vision of sustainable development recognized the need for a new outlook on global development. The Commission recognized that social and environmental realms were interdependent, environmental stressors and natural disasters were universal and affected everyone, and that sustainable development approaches could be the only method of protecting Earth’s ecosystems (Estes, 1993).

Today, society has generalized the Brundtland Commission’s definition of sustainability to refer to concepts and practices that provide positive or non-detrimental effects towards the environment and residing populations. It is also a common alternative for the term *green* to be used in place of *sustainability*. Because of this expanded generalization, sustainability today presents itself in many ways. These range from individual changes in a person lifestyle to industrial development of green technologies (The Princeton Review & U.S. Green Building Council, 2010).

Sustainability on the College Campus

Until recently on college campuses across the United States, buildings, both old and new, utilized massive amounts of energy. The Princeton Review and U.S. Green Building Council (2010) note that these buildings were a “profligate waster of water and other precious natural resources” and “had an indoor environment filled with toxic chemicals and limited air exchange” (p. 8). However, now, more and more college campuses are concerned about reducing their carbon footprint. Colleges are building new green buildings and renovating older buildings to incorporate more energy saving aspects (The Princeton Review & U.S. Green Building Council, 2010).

Building and construction of facilities is just one way college campuses are implementing sustainability. Sustainability is now being incorporated into all aspects of higher education, including but not limited to, curriculum, research, waste disposal, transportation, operations, food services, and water conservation. By doing this, colleges are preparing a new generation of leaders who will ultimately be responsible for the task of carrying out sustainability actions. Twenty-two universities, called together by Tufts University president, John Mayer, met in 1990 to discuss how sustainability could be incorporated into universities around the world. As a result of the meeting in Talloires, France, the Talloires Declaration was established as a universal commitment to incorporating sustainability into higher education. The Princeton Review and U.S. Green Building Council (2010) state that this commitment consisted of “a 10-point action plan for incorporating sustainability and environmental literacy in teaching, research, operations, and outreach” (p. 21).

In 2007, another commitment was made by colleges and universities through the formation of the American College and University President's Climate Commitment (ACUPCC). Similar to the Talloires Declaration, colleges and universities agreed to integrate sustainability into campus operations and curriculum. The ACUPCC set forth goals for each of the colleges to reach in order to reduce their greenhouse emissions. As part of the agreement, colleges and universities agreed to report their progress along with their climate action plans to the public (The Princeton Review & U.S. Green Building Council, 2010).

While colleges are looking for ways to reduce their carbon footprint and incorporate sustainability techniques on campus, many are also seeking ways to implement sustainability into the curriculum. By infusing sustainability into the curriculum, colleges are able to educate and train students for jobs in the green energy sector. Community colleges are in an ideal position to educate and train individuals for such jobs due to their ongoing relationships with local industries and businesses (Feldbaum & States, 2008).

Curriculum and Job Training

Green jobs encompass workplace duties that provide protection for ecosystems and biodiversity, reduction of energy and resource use, reduction of carbon output, and decreased production of waste. Feldbaum and States (2008) note that green jobs will fall under several different economic sectors, including but not limited to, “renewable energy, buildings and construction (energy efficiency), transportation, manufacturing, agriculture, and forestry” (p. 12). Potential jobs in several of these areas will be new occupations. However, most jobs are expected to be an alteration in job skills and duties

for occupations that already exist. These jobs will require an associate degree, certificate, or apprenticeship consisting of less education than a baccalaureate degree but more education than simply a high school diploma (Feldbaum & States, 2008).

Feldbaum and States (2008) cite examples of community colleges participating in the incorporation of sustainability into their curriculum. Red Rocks Community College in Lakewood, Colorado, offers a degree program in renewable energy technology with courses that teach such concepts as designing energy systems, auditing energy usage, and installing solar panels. In New York, Hudson Valley Community College offers a program that is focused on infusing their building trades program with energy efficiency methods or techniques. Central Carolina Community College in Pittsboro, North Carolina, has established a program on sustainable fuel production. This program is part of the alternative energy degree program which provides instruction utilizing the college's biofuels laboratory (Feldbaum & States, 2008).

Bozell and Liston (2010) describe how community colleges are participating in government initiatives to train low-income or unemployed individuals for higher-skilled, higher-paying jobs in the green sector. The successful training of individuals at the community college level will thrust low-income or unemployed individuals into a higher-income category and encourage growth in the green sector of the economy. In addition, these higher-skilled individuals will be able to obtain jobs that provide adequate family supporting incomes (Bozell & Liston, 2010).

In order to accomplish this training, colleges must develop programs and career pathways to aid students in transitioning from the world of academia to employment. However, this program implementation and procession at community colleges is hindered

by several factors. The first factor depicted is that employment demands for jobs within the green industry are unpredictable at this time. Projections imply that more jobs will be available in the future. Such new jobs might also open up possibilities for skilled workers in fields such as building management, construction, carpentry, electricity, plumbing, and sheet metal fabrication (Bozell & Liston, 2010).

The next factor that hinders colleges from implementing programs is that jobs in the green energy sector consist of those in the areas of renewable energy and energy efficiency. These types of jobs require higher skill levels. Therefore, community colleges are charged with the responsibility to train low-income, low-skilled workers for jobs requiring higher skills. College administrators are mostly concerned with how to efficiently train low-skilled individuals in a timely manner for such a wide range of potential green jobs. Lower skilled jobs such as home weatherization, a subsector funded by federal stimulus money, are considered entry-level positions that require less training; whereas, higher skilled jobs such as light system installation require more training, conceptual knowledge, and analytical skills in order to make appropriate decisions regarding complex systems (Bozell & Liston, 2010).

The third factor that Bozell and Liston (2010) discussed as a hindrance to green energy program implementation is the development of new green energy curricula and programs that meet funding requirements set forth by the American Recovery and Reinvestment Act. During their short life span, green energy programs already in place have generally served students who have higher educational backgrounds and, in some cases, have already accumulated more work experience. The funding provided by the American Recovery and Reinvestment Act is dependent on serving disadvantaged, low-

skilled, low-income populations. These individuals often have specific learning challenges or needs that existing green program curricula do not necessarily address. Therefore, community colleges are being challenged to create new curricula, revise current programs, and carefully consider student needs when designing new green energy programs (Bozell & Liston, 2010).

Bozell and Liston (2010) note that program development is also hindered by the lack of established green energy industry standards or certifications. The green energy industry is a fairly young industry. Because of this, standards and certifications within the industry are constantly changing. Without concrete standards, colleges are currently struggling with the development of new programs and curricula (Bozell & Liston, 2010).

The last factor hindering program development discussed by Bozell and Liston (2010) is funding reduction. The decrease in funding sparked competition between colleges already participating in regional partnerships. A college setting up a new program in each field or area quickly accumulates costs and demands additional equipment and facilities. With regional collaboration, colleges can utilize their own strengths and resources to focus on specific programs (Bozell & Liston, 2010).

In addition to degree and training programs with specific sustainability coursework, many colleges are also choosing to incorporate sustainability into multiple disciplines. In order to prepare a new generation for establishing a sustainable society, students must first learn how sustainability fits into all areas or disciplines. This will allow students to develop more in depth analytical and problem solving skills. Colleges and universities are utilizing workshops, such as the Ponderosa Project at Northern Arizona University, to demonstrate how sustainability can be integrated into different

subject areas. Over the course of ten years, this workshop served over 100 faculty members resulting in sustainability infusion into 120 courses across the curriculum (Stewart, 2010).

Research and Scholarship

One important way for colleges and universities to infuse sustainability on campus is through research. In recent years, the number of peer-reviewed journals focusing on the topic of sustainability has increased. In a survey conducted by the National Wildlife Federation in 2001, only 23% of colleges and universities reported having environmental specific research centers (Calder & Clugston, 2003).

Many institutions across the nation are conducting research in the area of sustainability. Georgia Institute of Technology, for example, is the home of the Institute for Sustainable Technology and Development. Calder and Clugston (2003) note that the research conducted at this facility so far has centered on “ozone pollution, fuel cells, diagnosing traffic gridlock, air pollution, and urban sprawl in U.S. cities.” Other research in sustainability can be found in Georgia Tech’s Environmentally Conscious Design and Manufacturing Program. Research in this program is associated with economic development in the state and focuses on environmental friendly designs and manufacturing processes. In the neighboring state of South Carolina, three universities have joined forces to establish the South Carolina Sustainable Universities Initiative. This initiative has centered its research on integrating sustainability into the areas of tourism, leisure activities, children’s literature, and English curriculum (Calder & Clugston, 2003).

It is important that sustainable research, like sustainable curriculum, be a group effort involving multiple disciplines. For instance, faculty in areas of landscape design, architectural design, and public policy may have to work together to implement sustainable designs for buildings. Research on sustainable adaptation solutions might require efforts by faculty in areas of both behavioral and communication sciences. Often times, research might span multiple disciplines at multiple universities. One effort underway by Louisiana State University and University of Oklahoma is the Southern Climate Impacts Planning Program, which focuses its research on the frequency and severity of weather and climate related events. This program's mission is to aid communities in developing better plans for weather and climate related disasters. The program focuses on the states of Arkansas, Louisiana, Mississippi, Oklahoma, Tennessee, and Texas (Andrews & Dyer, 2011).

Other colleges are conducting a smaller amount of research focusing on their own campuses, respectively. Faculty members and the Sustainability Committee at Borough of Manhattan Community College conducted a survey of 200 students to assess students' sustainability practices, attitudes, and beliefs concerning sustainability policies on campus. The results show that students believed sustainability issues, in terms of public concern, were very important. However, students only personally practiced sustainability in their own lives some of the time. Students also reported to have plenty of sustainability opportunities made available to them and a good deal of knowledge of the campus sustainability policies. Faculty and the Sustainability Committee stated that the results implied that the sustainability practices modeled on the college campus impacted

the student's personal practice of sustainability behaviors in everyday life (The City University of New York, 2013).

Operations

Some community colleges across the nation are choosing not only to provide green energy programs but also to demonstrate environmental awareness by building facilities that embrace the concept of sustainable living. Jorgensen (2006) describes the initiative set forth by Nicolet Area Technical College to become more environmentally aware. A statewide program called Wisconsin's Focus on Energy along with the Wisconsin Technical College System Foundation provided the college with funding for their green energy initiative. This funding purchased two renewable energy systems. The energy systems, consisting of a wind turbine and two solar electric panels, transform solar and wind energy into electricity. The electricity generated by these systems is used to provide energy to the Renewable Energy Center established on campus. Data gathering equipment and interpretive displays gather information that earns the college credit for the energy produced. The college also formed a partnership with the United States Department of Agriculture's Forestry Sciences Lab to study renewable hybrid poplars. Everyday usage of hybrid poplars includes biomass, detoxification of soil, and pulp. Nicolet's goal is to educate the community about renewable energy systems and to eventually develop training programs that prepare individuals to maintain renewable energy devices (Jorgensen, 2006).

Bacher (2008) explains that, on average, 90% of greenhouse gas emissions on college campuses are derived from buildings. As in Jorgensen (2008) where Nicolet Area Technical College set a goal to become more environmentally aware, interests in

reducing gas emissions by conserving energy is widespread; however, the act of developing such facilities is often costly and an undesired expenditure during hard economic times. Campuses that do desire to develop new facilities might choose to include increased daylighting of classrooms, use of solar heat during winter, and shielding of solar heat during summer. Other tactics such as the color of roof, reflective film on glass, and strategic landscaping also aid in reducing carbon emissions resulting in monetary savings (Bacher, 2008).

Facilities utilizing energy efficient measures can not only reduce costs for the institution, but they can also benefit the community in the surrounding area. A primary example would be water retention systems that collect and hold storm water instead of draining into local communities through drain systems. This saves the cost of maintenance or replacement of storm drain systems in the area and also helps to avoid damage to area wetlands that might have been damaged initially by the overflow of storm water. Community colleges can also conserve energy by using daylighting, exposing and/or shielding of solar energy, wind energy, and water retention systems (Bacher, 2008).

Kennedy (2009) describes the Los Angeles Community College District's efforts to become more energy efficient including climate control systems, daylighting of buildings, and wind power. One additional tool used within the district is a self-cleaning coating called Ultra-Violet Photocatalytic Oxidation. When this coating is exposed to sunlight, it reacts forming a chemical cleansing agent. This allows the building to self-cleanse and ideally would be applied to all buildings within the district in the future (Kennedy, 2009).

Turtle Mountain Community College in North Dakota has not just implemented some green energy standards but has completely designed their new campus to be totally powered by renewable energy. This community college utilizes wind turbines, geothermal energy, daylighting, low water landscaping, and water filtration to conserve resources and overall energy costs. The college plans to construct a wetland allowing for recycling of landscape irrigation and storm water (Stevenson, 2005).

Faculty and Staff Development

Rowe (2002) and Calder and Clugston (2003) report that the results of a survey conducted by the National Wildlife Federation state that 50% of colleges and universities support faculty development programs on environmental topics. These programs often give faculty the opportunity to learn about sustainability, share ideas between disciplines, and develop ways to integrate sustainability into their courses. Some colleges and universities utilized in-house programs for professional development while others utilize outside assistance (Rowe, 2002).

Massachusetts Institute of Technology (MIT) encourages professional development on sustainability issues through the Program on Environmental Education and Research (PEER). This program serves faculty and staff by involving them in ways to create sustainability content for their courses and by hands on research. This research focuses on environmental issues and how they relate to public policy, human behavior, and education (Rowe, 2002). Northern Arizona University utilizes a professional development program called the Ponderosa Project to promote integration of sustainability into all courses. For example, a chemistry course might incorporate discussion concerning the production of fertilizers and pesticides or the disposal of

industrial waste materials. A course in archaeology might incorporate local issues or concerns such as the Black Mesa Project. By doing this, students would learn about topics such as ecosystem degradation and overpopulation. At Georgia Tech, General Electric (GE) funds a professional development program which teaches faculty of all disciplines about sustainable technology and encourages the integration of sustainability into curriculum and research (Calder & Clugston, 2003).

Outreach and Service

According to Andrews and Dyer (2011), colleges and universities serve “as economic development drivers and infrastructure developers; as resources of expertise, student capacity and of leadership; and as advocates for specific policies at the local, state and national levels” (p. 20). Colleges and universities provide expert knowledge through assistance in research opportunities. By working with local governments, agencies, and community organizations, these institutions often form educational opportunities through internship and community service programs. These outreach and service opportunities are utilized to not only educate students on sustainability but also help to enhance the community’s knowledge of sustainability and how it can improve their area (Andrews & Dyer, 2011).

Partnering with local industries insures the success of such programs. For example, Kimes (2009) specifically describes the partnership between International Business Machines Corporation (IBM) and Metropolitan Community College in Omaha, Nebraska. IBM assisted in developing a green data-center management degree at the college. For this particular program, IBM donated the course materials and hardware. Mesalands Community College in Tucumcari, New Mexico, has formed a partnership

with GE in light of their new wind energy technician program. GE donated a small wind turbine to the college and has agreed to hire graduates of the program in the future. In Milwaukee, Wisconsin, Milwaukee Area Technical College and Johnson Controls, a local industry, formed a partnership to aid in the solar education program. Johnson Controls is constructing a solar education farm for the college. This farm will assist in training students who would like to become photovoltaic installers and designers (Kimes, 2009).

San Francisco Bay Region community colleges have jointly developed the New Energy Workforce (NEW) Initiative. This initiative was formed in order to address the current and future workforce needs for green energy industries and to keep abreast on current green technology trends. Skyline College, as part of this initiative, offers photovoltaic system classes to employees at area solar companies. In addition, Chabot College has joined with local industries to provide solar energy and power system field training opportunities where students learn the basics of installing and maintaining such systems (Feldbaum & States, 2008).

Student Opportunities

Colleges and universities across the United States have implemented programs and courses that teach students about sustainability. However, many colleges and universities are going one step further and offering other opportunities on campus for students to get involved in sustainability activities. Activities include, but are not limited to, volunteer projects, guest speakers or lectures, recycling competitions, research projects, green campus operations, Earth Day celebrations, on campus gardens, and sustainability-focused student organizations. College of Menominee Nation provides

many sustainability opportunities for students. This college not only has guest lectures and a recycling competition, but it also hosts a sustainable living fair. Students at this college are involved in assessing the college's energy consumption, providing an analysis of the waste stream on campus, and the developing of edible landscaping for the college (Caine & Horowitz, 2010).

In 2009, organizations at the University of Maryland worked together on a project known as *Energywise UM*. This sustainability project was centered on energy conservation and awareness. Participants in the program spoke with occupants in campus buildings about the electrical consumption in their building and ways they could reduce usage. The program also involved students collecting data and monitoring progress of energy consumption across campus. Students from a variety of majors were involved in this opportunity (Stewart, 2010). At Harvard University, students had the opportunity to participate in Harvard University's Green Campus Initiative (HGCI). In this initiative, students worked on various projects with faculty including projects involving the incorporation of organic foods at dining facilities on campus, reduction of computer energy on campus, investigation of alternative fuels for vehicles, development of sustainable buildings policy, and assessment of greenhouse gas emissions on campus (Calder & Clugston, 2003).

Administration, Mission, and Planning

Calder and Clugston (2003) assert, "an institution's mission statement expresses its fundamental vision and commitment" (p. 10015). Because many college presidents and other administrative officials are often hesitant to change an institution's mission statement, only recently have colleges and universities begun incorporating sustainability

into their mission statement. Middlebury College was one of the first institutions to incorporate sustainability or environmental advocacy into their mission statement. The following is the Statement of Environmental Commitment:

Middlebury College as a liberal arts institution is committed to environmental mindfulness and stewardship in all its activities. This commitment arises from a sense of concerned citizenship and moral duty and from a desire to teach and lead by example....Respect and care for the environment, sustainable living, and intergenerational responsibility are among the fundamental values that guide planning, decision making, and procedures (Calder & Clugston, 2003, p. 10015).

After incorporating sustainability into their mission statement in 1995, Middlebury College has further infused this commitment in all areas of the college. The college has since hired a Director of Environmental Affairs, expanded their environmental studies program, and developed a sustainable design policy (Calder & Clugston, 2003).

In 2000, the University of Florida established an Office of Sustainability on campus. Three main areas were designated as focus areas for incorporating sustainability throughout campus. The first of these, "Greening the University of Florida" involved a "grass-roots movement" (Calder & Clugston, 2003, p. 10016). This movement combined faculty, staff, and students to address and integrate sustainability into curriculum and campus operations. The second of the focus areas was "Healthier Communities" (Calder & Clugston, 2003, p. 10016) which centered around educating the community on sustainable practices that would improve community health. The third focus area, "Future Research Activities," (Calder & Clugston, 2003, p. 10016) established the

potential for research funding and interdisciplinary collaboration across the university (Calder & Clugston, 2003).

Similarly, Caine and Horowitz (2010) note that the hiring of a sustainability coordinator within offices or departments of sustainability can be vital in implementing sustainability efforts across campus. Another component that can aid administration in furthering sustainability efforts is the establishment of a green purchasing policy. These types of policies encourage the buying of green cleaning supplies, light-emitting diode (LED) or compact fluorescent light (CFL) bulbs, energy-efficient appliances, and other items that contribute to sustaining the environment (Caine & Horowitz, 2010).

In planning, administrators and trustees should be aware of the consequences of climate change impacts. Such events as hurricanes, tornadoes, flood, droughts, and winter storms can present financial and safety risks. In reference to such climate change impacts, the Andrews and Dyer (2011) assert, “institutional leadership must be proactive about ensuring their campus physical plant and infrastructure are as resilient as possible in the face of these new threats.” College and university presidents, administrators, and others in leadership positions are responsible for discussing, preparing, and planning for the impact of such disasters on their respective campuses. Strategies for handling climate impact might even be incorporated into master plans or operational policies for the institution (Andrews & Dyer, 2011).

Summary

The literature researched in this study begins with a discussion of how an individual’s perspective on sustainability or environmental concern is affected by their personal moral norms. This was followed by a brief discussion of the evolution of

sustainability in the United States and its current place in today's society. The discussion concerning the evolution of sustainability provided a glimpse of how earlier populations of people showed environmental concern through religious and magical practices followed by documented political and environmental movements of later populations that have shaped the concept of sustainability today. Finally, the researcher reviewed literature concerning sustainability on college campuses. Sustainability efforts are integrated into the areas of curriculum and job training, research and scholarship, operations, faculty and staff development and rewards, outreach and service, student opportunities, and administration, mission, and planning. Many different forms of sustainability practices are discussed within each of these areas.

Within the area of curriculum and job training, the literature reviewed demonstrated how colleges are incorporating sustainability into all discipline areas and preparing students to complete job training for specific green sector jobs. These jobs will require workplace duties that provide protection for ecosystems and biodiversity, reduction of energy and resource use, reduction of carbon output, and decreased production of waste. In the area of research and scholarship, sustainability research efforts by colleges and university are described. Colleges and universities are conducting different levels of research in order to understand more about the effects of sustainability in areas such as community and state economic development, campus sustainability practices, and student attitudes towards sustainability on campus. The literature reviewed on operations described the effort colleges used to infuse sustainability into the functioning of the college campus through utilizing renewable energy sources or renewable energy strategies when building additional buildings or renovating older

buildings. In reference to faculty and staff development and rewards, colleges and universities displayed the use of both in-house and external programs to educate their personnel on environmental topics. These programs provided opportunities for sustainability education, collaboration between disciplines, and development of creative sustainability coursework integration. Literature reviewed concerning outreach and service demonstrated that colleges and universities provided opportunities for students through internship and community service. These opportunities were made possible by partnerships between the institutions and local governments, agencies, and community organizations. The literature reviewed concerning student opportunities exhibited the different events offered by colleges and universities to encourage students to become engaged in sustainability efforts. These opportunities included guest lectures, recycling programs, sustainability projects, student organizations focused on sustainability, campus celebrations, and student involvement in developing new sustainability programs or guidelines on campus. In regards to the literature reviewed on administration, mission, and planning, the literature demonstrated how colleges and universities have incorporated sustainability into their mission, planning, and decision-making by alteration of the mission statement to reflect sustainable efforts on campus, utilization of campus wide collaboration on incorporating sustainability efforts, and implementation of community sustainability education. Some colleges and universities also established an Office of Sustainability and developed a position of sustainability coordinator. The literature also reflected the importance of administration preparing for environmental or natural disasters by incorporating such plans into operational guidelines.

CHAPTER III

METHOD

Introduction

This chapter summarizes the research method that was used to assess established sustainability guidelines in place at the 15 public community and junior colleges throughout Mississippi during the 2013-2014 academic year. Data were collected using a qualitative, multiple case study research design. In this research design, no group received a treatment or effect in order to carry out the study. This chapter includes the research design, source of data, procedures, data collection, and data analysis.

Research Design

Fraenkel and Wallen (2009) explain that qualitative research deals with the “quality of relationships, activities, situations, or materials” (p. 422). Within qualitative research, different types of methodologies exist including narrative research, phenomenology, grounded theory, case studies, ethnographic and historical research. For this study, the case study methodology is most applicable. Yin (2009) asserts that a case study is “an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (p. 18). Within case study research, there are four major design types that the researcher could choose to employ. These include 1) single-case

holistic designs, 2) single-case embedded designs, 3) multiple-case holistic designs, and 4) multiple-case embedded designs (Yin, 2009). Fraenkel and Wallen (2009) differentiate single and multiple case studies by explaining that a single case study focuses on one individual, school, program, event, project, or activity; whereas, the multiple case study refers to the use of multiple cases to gather information which will contribute to the overall research. In addition, Yin (2009) explains that single and multiple case studies can be further divided into holistic and embedded design categories. Holistic design refers to the global nature of an entity being studied. Embedded design addresses the entity being studied and any additional subunits within that entity (Yin, 2009). For this study, the researcher used the multiple-case holistic design.

The multiple-case holistic design was chosen based on the desire to research the phenomenon of sustainability practices utilized within the context of the community college campus specifically within the areas of curriculum, research and scholarship, operations, faculty and staff development, outreach and service, student opportunities, and administration, mission, and planning. The multiple case study approach is also applicable due to the research interest of sustainability methods utilized at each of the 15 public community and junior colleges in Mississippi. The holistic approach to the multiple-case design was selected due to studying sustainability practices in its totality by reviewing and comparing established sustainability guidelines at each college.

Data

The units of analysis for this research study were the sustainability guidelines in place at each of the 15 public community and junior colleges in Mississippi. For research questions one through seven, the researcher studied existing descriptive information

pertaining to the established sustainability guidelines at the 15 public community and junior colleges in Mississippi. This information consisted of sustainability guideline documents, informant commentary, college policy documents, and college course catalogs. The researcher requested permission to utilize this information to ascertain the established sustainability guidelines in the areas of curriculum, research and scholarship, operations, faculty and staff development, outreach and service, student opportunities, and administration, mission, and planning at each community college.

Procedures

Permission to collect and analyze data for this study was requested in writing from the Mississippi State University Institutional Review Board. In addition, the researcher requested permission to obtain sustainability guidelines from each of the 15 community and junior colleges in Mississippi from the Mississippi Association of Community and Junior Colleges. Additional permissions were required by some of the individual community and junior colleges' Institutional Review Boards. A key informant at each of the 15 community and junior colleges was identified by the Deputy Director for Programs and Accountability at the Mississippi Community College Board. A written request was sent to the key informants via email requesting assistance in obtaining copies of campus sustainability guidelines. At some colleges, additional key informants were identified and additional requests were sent via email requesting assistance in obtaining copies of campus sustainability guidelines. The researcher requested a copy of each college's sustainability guidelines be returned by postal mail or email. Information was analyzed and generalized from the returned sustainability guidelines.

Data Collection

In order to address research questions one through seven, the researcher contacted key informants at each of the 15 community and junior colleges in Mississippi to request copies of campus sustainability guidelines. Informants provided sustainability guideline documents, commentary, and college policy documents via email. Additionally, the researcher retrieved college course catalogs from individual college websites. This information was used to evaluate the current established sustainability guidelines on each campus. The researcher more specifically looked at established sustainability guidelines in the areas of curriculum, research and scholarship, operations, faculty and staff development, outreach and service, student opportunities, and administration, mission, and planning.

Data Analysis

Data collected in this study was analyzed in order to answer the following questions:

1. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of curricula?
2. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of research and scholarship?
3. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of operations?
4. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of faculty and staff development?

5. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of outreach and service?
6. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of student opportunities?
7. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of administration, mission, and planning?

For this study, Creswell's (2012) approach for organizing and analyzing data was adapted and utilized. This approach included the following steps 1) preparing and organizing data; 2) engaging in exploration of data through coding; 3) using codes to develop description of themes in data; 4) representing findings through narrative and visual representations; 5) interpreting the results; and 6) conducting strategies to validate findings.

The researcher organized the data by grouping documents by colleges and then created a table to show what information had been received. The researcher then began coding the data collected by identifying themes and patterns throughout the documentation. These themes helped the researcher to form categories that related to the initial research questions. This information was recorded, interpreted, and then presented as the results and findings of the study. In order to validate the findings, the researcher then utilized the process of triangulation. Creswell (2012) defines triangulation as "the process of corroborating evidence from different individuals, types of data, or methods of data collection in descriptions and themes in qualitative research" (p. 259). To corroborate information and to address the research questions, the researcher compared sustainability guideline documents, informant commentary, college policy documents,

and college course catalogs. In order to prepare a descriptive analysis for the research questions, content analysis was then used to report and analyze the data collected.

CHAPTER IV
RESEARCH RESULTS AND FINDINGS

Introduction

The purpose of this chapter is to report the findings from an analysis of data collected during a multiple case study of sustainability guidelines in place at each of the 15 public community and junior colleges in Mississippi. More specifically, this analysis looked at established sustainability guidelines in the areas of curriculum, research and scholarship, operations, faculty and staff development, outreach and service, student opportunities, and administration, mission, and planning.

The following research questions were addressed during this study:

1. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of curricula?
2. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of research and scholarship?
3. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of operations?
4. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of faculty and staff development?
5. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of outreach and service?

6. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of student opportunities?
7. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of administration, mission, and planning?

Case Study Analysis

Using a multiple-case holistic design, the researcher analyzed the sustainability guidelines in place at each of the 15 public community and junior colleges in Mississippi. The researcher was granted permission to utilize this information to ascertain the established sustainability guidelines in the areas of curriculum, research and scholarship, operations, faculty and staff development, outreach and service, student opportunities, and administration, mission, and planning at each community college. Of the 15 public community and junior colleges, 6 reported sustainability guideline information for their respective college. Each college has been assigned a letter to protect their identity and will be referred to as College A, College B, College C, College D, College E, and College F through the remainder of this study.

Research Question One

Research question one asked what sustainability guidelines are in place at each community and junior college in Mississippi in the area of curricula. Four of the six colleges reported having sustainability topics discussed in some of their courses. Of this 67%, College A incorporated the discussion of human relationships to the environment and environmental concerns into their Principles of Biology II course. College B, College C, and College F offer specific Environmental Science courses. These courses

discussed ecological and environmental problems, human relationships to the environment, and how to preserve the environmental quality. College D and College E did not report having any courses that incorporated sustainability topics.

Research Question Two

Research question two asked what sustainability guidelines are in place at each community and junior college in Mississippi in the area of research and scholarship. None of the six colleges reported having sustainability guidelines in the area of research and scholarship.

Research Question Three

Research question three asked what sustainability guidelines are in place at each community and junior college in Mississippi in the area of operations. 100% of responding colleges reported having sustainability guidelines in place in the area of operations.

College A reported using sustainability guidelines as a participant of the Mississippi Bureau of Buildings and Grounds Smart-Metering Project. Participation in this project required all college buildings to be equipped and monitored with smart metering technology. Smart metering technology has been used to assess the amount of energy consumed in all campus buildings to determine if the buildings are energy efficient. College A also contracted with Johnson Controls to implement an energy management system that allows the college to remotely control the thermostats in all buildings throughout the campus. The Board of Trustees reviews the energy reports from this system annually to evaluate the savings rendered.

College A also noted that, during a kitchen renovation project, the cafeteria was equipped with energy efficient steam ovens. These ovens function to steam, bake, roast, and oven-fry various foods. In turn, the energy efficient steam ovens reduce energy usage, cooking time, and overall labor costs.

College B reported having energy conservation and building management guidelines. These guidelines were originally produced by a consulting firm who specialized in energy management and are considered confidential. College B stated that the sustainability guidelines for operations are focused on energy conservation of campus facilities and recycling initiatives.

College C reported incorporating sustainability guidelines in the area of operations in several ways. In reference to building construction and renovation, the college utilizes the International Building Code as prescribed by the State Fire Marshal. The campus buildings also adhere to building energy codes set forth by the U.S. Department of Energy. The college noted that they attempt to utilize building designs that are 30% more efficient than the codes mentioned require.

College C consulted with Siemens in 2004 to form and implement sustainability guidelines in energy conservation practices. These practices included electronic lighting fixtures, low flow water closets, and HVAC systems with energy recovery elements. Double-paned windows with UV blocking tint was installed to reduce thermal transfer. College C also continually consults with Siemens when forming mechanical and electrical designs. In addition, the college has utilized Siemens' computerized energy management systems throughout the college. These systems schedule HVAC system run times along with electronic light occupancy sensors. In addition, Tennessee Valley

Authority assisted College C with a lighting upgrade by changing out ballasts and lights in campus buildings. The college also utilizes daylight harvesting technology, which reduces the need for electric lighting during daytime hours. The college implemented a “Turn the Light Off” campaign to encourage faculty and staff to aid in saving energy by turning the lights off when possible. College C also programs computer monitors to enter sleep mode after 15 minutes of no activity. An energy audit is conducted by the college every five years, in conjunction with Tennessee Valley Authority, to assess any abnormal energy loss from buildings.

College C reported using sustainability guidelines to reduce waste on campus. The college encourages the use of email, double-sided copying and printing. The college also noted they have contracted with a waste management company to collect paper materials for recycling. College C reported recycling laser print cartridges, computers, monitors, and other electronic components. In addition, the college recycles used furniture by using it in other facilities on campus. If left unclaimed or unneeded, the college donates the furniture to a charitable cause or sells it at auction. The college also utilizes recycling and composting of leftover food in their culinary arts program. College C reported utilizing sustainability guidelines in conserving water on campus. This is done through the use of low flow urinals, toilets, and faucets, which utilize less water than traditional forms of these products. College C constructed a water reservoir in order to gather water from a local stream in order to irrigate all of the college’s athletic fields.

College C noted that sustainability guidelines are incorporated into a food program on campus. The college provides a farmers’ market for local producers to sell their produce on campus. In addition, the college reported utilizing sustainable

landscaping methods. Plants that require minimal water are selected for use and sprinkler systems operate on timers in the early morning to maximize efficiency.

College C reported that sustainability guidelines are incorporated in the campus sustainable transportation program. In this program, the college utilizes a bus system to transport students between campuses. Students can park at one campus and ride the bus to and from another campus. The college also provides bicycle racks on campus to encourage bicycle use. Through the use of weekly email reminders, newspaper announcements, and campus fliers, College C encourages students to share rides with classmates when traveling to off-campus meetings, utilize the campus cafeteria or bring their lunch rather than driving to off campus locations, utilize the bookstore for the purchase of supplies instead of driving to stores away from campus, and use email and phone to reduce the need for a face-to-face meeting.

College C noted that sustainability guidelines are followed when purchasing products for janitorial or grounds services. Specifically, cleaning products are purchased from environmentally and socially responsible companies who claim their products are environmentally friendly. College C reported utilizing a no-chemical window washing system and a no-chemical steam cleaning system for restrooms. Bathrooms on campus are equipped with 100% recyclable and biodegradable towels and tissue. Unsoiled garbage can liners are also reused. Hazardous or toxic wastes produced by chemistry and biology laboratories on campus are disposed of through a chemical disposal company. College C encourages the clean up of spills as soon as possible through dry cleaning techniques including sweeping, absorbent socks, and wet/dry vacuums. By cleaning up spills quickly, the college prevents the contamination of soil or groundwater.

College D noted that within their sustainability guidelines dealing with operations they not only assign specific operational objectives but also assign responsibilities of implementing such guidelines to individuals on campus. In general, College D strives to implement a preventative maintenance and monitoring plan for its facilities and systems. The college described using data loggers to monitor humidity, temperature, and lighting systems throughout all campus facilities to ensure there are no abnormal energy usages or losses.

For instructional rooms, College D utilizes staff or faculty occupying that room to ensure that doors remain closed when the HVAC system is operating. The college also asks that individuals on campus ensure doors are closed between HVAC conditioned space and non-conditioned space. College D reports that temperature settings for occupied rooms are not to be set below 74 degrees when the air conditioning is operating. The air conditioning is set to turn completely off once students leave the room at the end of the day. However, the college allows for air-conditioning start and stop times to be adjusted depending on weather. During unoccupied times, outside air dampers are closed. Air conditioning is not used during the summer time unless the facility is occupied for instructional or cleaning purposes. The college reports that during mild weather cross ventilation techniques are utilized instead of the HVAC system. This allows the adjustment of temperature through the opening of windows or doors on each side of a room. College D notes that relative humidity is kept at or below 60%. The college reports this is especially important to ensure dry food storage areas are maintained properly.

College D noted that their sustainability guidelines also regulate the use of heating equipment in campus facilities. The occupied temperature should be set to 72 degrees or below. The unoccupied temperature setting should be set to 55 degrees or 60 degrees for extreme weather conditions. During the milder weather of spring and fall, the college turns off all steam, forced air, and hot water heating systems. The hot water systems are set no higher than 120 degrees for general use and 140 degrees for cafeteria use. Hot water recirculating pumps are also switched off during unoccupied times. Heating systems that require oil and propane are checked monthly and before and after a new delivery.

College D reported that lighting per guidelines should be turned off when an area is unoccupied. Like College C, College D encourages faculty and staff to turn off lights when leaving an instructional room or office. The college ensures that all outside lighting is off during daytime hours. At night, all interior lights are off except the areas being cleaned by the custodians. Also, College D encourages faculty and staff to use the sleep mode on computers when unattended during the day and to turn off equipment when leaving at night including computers, monitors, local printer, speakers, and copying machines.

College D indicated that sustainability guidelines are also used on campus to conserve water. The college ensures plumbing and roof leaks are reported and repaired as quickly as possible. College D waters the grounds only between the hours of 4:00am to 10:00 am as to avoid the main heat of the day. Installation of water sub-meters and cooling tower supply lines are utilized in some areas to eliminate sewer charges.

College E reported utilizing sustainability guidelines in operations and that they, like College A and College C, utilize a building management system that follows temperature guidelines and allows thermostats to be remotely control thermostats throughout the various buildings on campus. College E states that the buildings are set to “occupied mode” during regular work hours and “unoccupied mode” during non-work hours, weekends, and holidays. Another operational area where College E reported utilizing sustainability guidelines was through lighting control systems in campus facilities. This lighting control system only runs lights in facilities when needed. In previous years, the college reported replacing traditional fluorescent lighting with higher efficiency fluorescent lighting. College E also noted that sustainability guidelines are in place for conserving water within campus facilities. Water restricting devices, which reduce the amount or flow of water, are used on sinks and most toilets. The college also requires the inclusion of low water use products in all renovations and newly constructed facilities on campus.

In addition, College E reported having sustainability guidelines in place for recycling metal, cardboard, and paper on campus. The college stated that sustainability guidelines dictate the purchasing of products, especially cleaning products, when practical from companies that claim to be environmentally and socially responsible. College E noted that sustainable landscaping guidelines are used when practical through the utilization of native plants, integrated pest management, and synthetic lawn.

College E reported that sustainability guidelines for sustainable transportation have slowly been implemented on campus. Staff in the landscaping department moved from the use of regular trucks to battery powered carts, high efficiency gas, and high

efficiency diesel carts. Similar to College C, College E also reported that bicycle racks were installed on campus to encourage bicycle use.

College F reported that sustainability guidelines have been in place for several years for facilities operations on campus. The college noted that the college Board of Trustees is committed to using high efficiency heat pump HVAC systems in renovations and new construction on campus. College F also reported that the Physical Plant on campus was authorized to replace all fluorescent light fixtures with LED light fixtures. This will continue to occur over the course of a 7-year span. Similar to College E, College F reported using a lighting control system on campus along with occupancy sensors and daylighting sensors.

College F noted that since implementing sustainability guidelines, the college has been monitoring energy usage with assistance from Entergy. The college reported that energy usage has decreased despite the increase of square footage of facilities on campus.

Research Question Four

Research question four asked what sustainability guidelines are in place at each community and junior college in Mississippi in the area of faculty and staff development.

Two of the six colleges, or 33%, reported having faculty and staff development concerning sustainability guidelines or efforts on campus. College C reported that faculty and staff development concerning sustainability now begins at the time an employee is hired. In 2013, the new employee orientation packets began including instructions for paper reduction, transportation cost reduction, and a list of the college's sustainability efforts and accomplishments. A webpage for the college was made available for faculty and staff to access articles concerning sustainability. In addition, the

college includes a “Going Green Tip of the Week” in the employee newsletter which is emailed weekly. College C also initiated a “Turn the Lights Off” campaign and implemented faculty and staff development about conserving electricity. Moreover, College C also reports that regular faculty and staff meetings are held to discuss continuing ways to follow and implement sustainability guidelines on campus.

College D reported that sustainability guidelines are used for faculty and staff development to help identify how each employee can conserve energy on campus. Faculty and staff members are asked to implement the sustainability guidelines whenever they are present in an instructional room or office. This includes being responsible for energy conservation by turning off lights in unoccupied areas and turning off computers, monitors, local printers, speakers, and copying machines when leaving at night. The college’s administration regularly stresses the importance and effect of conserving energy on campus.

College A, College B, College E and College F did not report utilizing sustainability guidelines for faculty and staff development.

Research Question Five

Research question five asked what sustainability guidelines are in place at each community and junior college in Mississippi in the area of outreach and service.

Three of the six colleges, or 50%, reported having sustainability guidelines that incorporated outreach and service. College B hosts a recycling initiative both on campus and throughout the local community. In addition, College B partners with the local sheriff’s department to bail the recyclable material collected. Approximately 100,000

pounds of recyclable material is bailed and sold on a monthly basis. The revenue College B collects from the recycling initiative is used for scholarship funds for students.

College C reported that they partner with local, state, and federal agencies to obtain advice and funding as it is related to energy conservation. The college noted that locally the power cooperative assists in addressing high energy consumption issues on campus. At the state level, College C reported that assistance with building design is obtained from the Bureau of Buildings and Grounds and funding for special sustainability projects is obtained from the Mississippi Department of Finance and Administration. At the national level, College C obtains funding for energy related projects and assistance in building efficiency from Tennessee Valley Authority and the United States Department of Education.

College D reports that outreach and service efforts concerning sustainability are communicated through administration. The administration serves to provide relevant information concerning the importance and effects of sustainability on campus to internal and external constituents. However, specific constituents were not reported. College D also hosts an annual event called “My College Cares.” During this event, students participate in volunteer efforts to aid in community outreach. These projects are often sustainability-related including, but not limited to, city-wide clean up and helping area churches replace older light fixtures with ones that are sustainably supported.

College A, College B, College E and College F did not report utilizing outreach and service efforts concerning sustainability.

Research Question Six

Research question six asked what sustainability guidelines are in place at each community and junior college in Mississippi in the area of student opportunities.

Two of the six colleges, or 33%, reported having sustainability guidelines that incorporated student opportunities. College C reported that students are constantly kept up to date about sustainability efforts on campus through email and the school newspaper. The college reported that the Science Club on campus involves students in the collection and recycling of aluminum cans. The college also reports that the Student Government Council demonstrates leadership through their promotion of anti-littering on campus and energy conservation throughout student dormitories.

College D reported that sustainability guidelines involve students in various ways. The college's Office of Recruiting and Campus Life hosts a "going green" event each month. The event encourages students to participate in campus clean up, restoration and repurposing of campus items such as old furniture, alternative solutions for everyday uses such as utilizing fruit for fabric dye. A reminder is sent out via text message to remind students to participate.

College D offers students the opportunity to participate in their annual event titled, "My College Cares." During this event, students are excused from all classes in order to participate in volunteer efforts. These projects benefit the community and are often sustainability-related.

Additionally, College D also encourages student participation in the use of eBooks. eBooks allow the college to cut down on printing and ordering of textbooks. The importance of using such eBooks is shared with students during summer and in-

semester orientation classes. Students are also taught how to highlight and email sections of the eBooks to utilize for later use and to reduce the need for printing.

Research Question Seven

Research question seven asked what sustainability guidelines are in place at each community and junior college in Mississippi in the area of administration, mission, and planning.

Three of the six colleges, or 50%, reported having sustainability guidelines that were incorporated in the area of administration, mission, and planning. College B reported that in 2013 the college formed an Office of Sustainability. The office employs a Director of Sustainability and a Sustainability Projects Coordinator who report directly to the Vice President of Physical Plant and Auxiliary Services. The office continually works to develop and update sustainability guidelines and initiatives on campus. Energy conservation, recycling, and other sustainability projects are overseen by this office and involve working relationships with other employees, students, and the local community.

College C reported the college has certain committees and positions that aid in incorporating sustainability into the areas of administration, mission, and planning. The college reports that the President's Cabinet, the Vice-President of Planning, the Director of Physical Plant, and the Master Energy System Manager share the responsibility of enforcing sustainability guidelines and efforts. This, in turn, ensures the college is a good steward of its resources.

College D, like College C, reported utilizing certain positions to carry out the incorporation sustainability guidelines in administration, mission, and planning. College D noted that each facility has an administrator who is responsible for the total energy

usage of that facility. The college utilizes an Energy Education Specialist to conduct routine audits of all campus facilities. The results of such audits are reported to designated personnel and then reported at a later date to the college board. The Energy Education Specialist also provides monthly energy reports which highlight energy savings to the facility administrators. This individual is also responsible for making or ordering adjustments to the college's energy management system which controls the temperature and scheduled operating times for the HVAC system.

CHAPTER V
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

This chapter presents the summary of the study, conclusions, and recommendations as a result of the study. The purpose of this study was to review the established guidelines in place at each of the 15 public community and junior colleges in Mississippi during the 2013-2014 academic year. Specifically, dimensions studied within the established guidelines included curriculum, research and scholarship, operations, faculty and staff development, outreach and service, student opportunities, and administration, mission, and planning.

The following research questions guided this study.

1. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of curricula?
2. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of research and scholarship?
3. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of operations?
4. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of faculty and staff development?

5. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of outreach and service?
6. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of student opportunities?
7. What sustainability guidelines are in place at each community and junior college in Mississippi in the area of administration, mission, and planning?

Summary

Chapter I provided statement of the problem, purpose of the study, significance of the study, delimitations and limitations, and definition of terms. The purpose of this study was to review the established guidelines in place at each of the 15 public community and junior colleges in Mississippi and to illuminate the ways in which these community colleges interacted with environmental sustainability during the 2013-2014 academic year. This study will allow presidents, vice presidents, facilities or operations directors, and other officials within the Mississippi community college system to compare community college sustainability guidelines throughout the state, have a basis for future research, and will provide assistance to in further integrating sustainability guidelines in the areas of curriculum, research and scholarship, operations, faculty and staff development, outreach and service, student opportunities, and administration, mission, and planning.

Chapter II provided the review of related literature. The researcher examined literature related to the concern humans show towards environmental threats which was discussed in relation to Stern's (2000) VBN theory of environmentalism. The researcher then followed with a brief discussion on the evolution of sustainability in the United

States and its current place in today's society. Finally, the researcher reviewed literature concerning sustainability on college campuses. This discussion specifically included the integration of sustainability on campus in the areas of curriculum, research and scholarship, operations, faculty and staff development, outreach and service, student opportunities, and administration, mission, and planning.

Chapter III consisted of the research design, data, procedures, data collection, and data analysis. Included within the data analysis section were the research questions addressed in the study. In this study, the researcher utilized a qualitative, multiple case study research design.

Chapter IV analyzed the written documentation provided by 6 of the 15 public community and junior colleges in Mississippi. This documentation represented the sustainability guidelines and practices that were in place during the 2013-1014 school year. This information was utilized by the researcher to answer the seven research questions for the study.

Conclusions

1. 67% of the colleges reporting included sustainability topics in at least one course on campus. These courses discussed ecological and environmental problems, human relationships to the environment, and how to preserve the environmental quality.
2. None of the six colleges reporting had sustainability guidelines that were related to research and scholarship.
3. 100% of the reporting colleges had sustainability guidelines in the area of operations. Although all related to operations, these guidelines and

resulting practices differed somewhat between campuses. Most all of the reporting colleges specified having energy management systems in place that controlled HVAC settings, thermostats, and lighting throughout campus facilities. These energy management systems were additionally monitored by a partnering energy company who assisted in efficiency reporting. Other operational areas that were guided by sustainability at the reporting colleges included waste reduction practices, recycling, water conservation practices, toxic waste disposal, green purchasing, and sustainable transportation.

4. 33% of the reporting colleges noted having faculty and staff development concerning sustainability guidelines on campus. These faculty and staff development sessions included ways that faculty and staff could reduce daily energy usage through routine practices that would result in paper reduction, electricity conservation, and transportation cost reduction.
5. 50% of the reporting colleges have sustainability guidelines that incorporated outreach and service. One college reported hosting a recycling initiative both on campus and throughout the community. The college partnered with the local sheriff's department to aid in initiative. A second college noted outreach included partnerships at the local, state, and federal levels in order to bring in advice and financial support for sustainability projects. The other college noted that administration dealt with the reporting of sustainability on campus, including community outreach projects, to both internal and external constituents.

6. Of the reporting colleges, 33% reported having sustainability guidelines that incorporated student opportunities. Student opportunities reported included student organizational opportunities and efforts on campus through recycling, antilitter campaigns, campus and community clean up efforts, and monthly “going green” workshops.
7. 50% of the reporting colleges noted having sustainability guidelines that were incorporated into the area of administration, mission, and planning. These colleges reported that certain committees, positions, and offices on campus are responsible for creating, updating, and enforcing sustainability guidelines and procedures on campus.

Despite examples cited by Feldbaum and States (2008) concerning the incorporation of sustainability based degree programs at community colleges throughout the nation, this study found that reporting colleges incorporated sustainability into particular courses and did not report having actual sustainability based degree programs. Also, in a survey conducted by the National Wildlife Federation in 2001, a small portion of colleges and universities reported having environmental specific research centers (Calder & Clugston, 2003). The findings of this study reflected no participation in sustainability research by the reporting colleges.

Moreover, in previous literature, it was noted that more energy saving aspects were being incorporated into construction of new green buildings and renovation of older buildings (The Princeton Review & U.S. Green Building Council, 2010). Similarly in this study, all of the colleges reported utilizing energy conservation techniques or an energy management system in new and older buildings on campus. Furthermore, Rowe

(2002) noted that some colleges and universities utilized in-house programs for professional development on sustainability topics, and the findings of this study illustrated that a portion of the reporting colleges similarly host their own faculty and staff development on sustainability topics and efforts on campus. In the area of outreach and service, previous literature suggested that outreach and service opportunities are utilized to both educate students on sustainability and to help enhance the community's knowledge of sustainability and how it can improve their area (Andrews & Dyer, 2011). The results of this study reflect similar ideals. Half of the reporting colleges noted outreach and service related to sustainability at various levels including local, state, and federal.

Reviewed literature suggested many colleges and universities are offering other opportunities on campus for students to get involved in sustainability activities other than coursework (Caine & Horowitz, 2010). As reflected in the findings, colleges reporting in this study utilized student opportunities such as student organizational opportunities, recycling initiatives, antilitter campaigns, campus and community clean up efforts, and monthly "going green" workshops. Calder and Clugston (2003) noted that colleges and universities only recently began incorporating sustainability into their mission statements, policies, and administrative positions. The results of this study show that half of reporting colleges had certain committees, positions, and offices on campus that were responsible for sustainability guidelines and procedures on campus, thus supporting existing research that claims environmental sustainability is a currently developing phenomenon on college campuses.

Recommendations

1. Community college administrators, committees, and other personnel designated to help to develop and enforce sustainability guidelines on campus should be exposed to sustainability guidelines and efforts currently in place at other community colleges across the United States.
2. A consortium of the 15 public community and junior colleges in Mississippi should be pursued so that these entities can share and research ideas of how to further incorporate sustainability guidelines into the areas of curriculum, research and scholarship, operations, faculty and staff development, outreach and service, student opportunities, and administration, mission, and planning.
3. Further exploration of potential jobs that incorporate sustainability efforts in the region must occur in order for curricula to be updated and new degree programs to be developed. This could be accomplished by on-site visits, review of existing literature, and partnering with local industries.
4. Future studies should be done to assess the ongoing implementation of sustainability guidelines in light of the recent Mississippi Energy Sustainability and Development Act or House Bill 1296 which required all community and junior colleges to submit a detailed Energy Management Plan by November 1, 2014.

Information from this study will allow presidents, vice presidents, facilities or operations directors, and other community college officials to compare and examine the sustainability guidelines in place at each of the community and junior college campuses

within Mississippi. This study provides a basis for future research by illuminating the ways that Mississippi junior and community colleges interacted with environmental sustainability and will provide assistance to presidents, vice presidents, facilities or operations directors, and other officials within the Mississippi community college system in further integrating sustainability guidelines in the areas of curriculum, research and scholarship, operations, faculty and staff development, outreach and service, student opportunities, and administration, mission, and planning.

REFERENCES

- American College and University Presidents Climate Commitment. (2013). *Frequently asked questions: What is climate neutrality?* Retrieved from:
<http://www.presidentsclimatecommitment.org/about/faqs#10>
- Andrews, J., & Dyer, G. (2011). *Higher education's role in adapting to a changing climate*. Boston: American College & University Presidents' Climate Commitment.
- Association for the Advancement of Sustainability in Higher Education. (2010). *Sustainability curriculum in higher education: A call to action*. Retrieved from:
[http://www.aashe.org/files/A_Call_to_Action_final\(2\).pdf](http://www.aashe.org/files/A_Call_to_Action_final(2).pdf)
- Bacher, L. C. (2008). Environmentally conscious campus development. [Electronic version]. *New England Journal of Higher Education*, 23(2), 25-27. Retrieved from: <http://files.eric.ed.gov/fulltext/EJ850711.pdf>
- Bozell, M. R., & Liston, C. D. (2010). Building effective green energy programs in community colleges. [Electronic version]. Workforce Strategy Center, May, 1-29. Retrieved from: <http://files.eric.ed.gov/fulltext/ED510248.pdf>
- Bradley, P. (2010). Finding the formula: Local ties to industry driving successful green programs. [Electronic version]. *Community College Week*, 22(24), 6-7. Retrieved from: <http://ccweek.com/news/articlefiles/1948-CCW071210-AllPages.pdf>

- Caine, R., & Horowitz, R. (2010). *Minority-serving institutions green report: 2010 campus sustainability survey*. Atlanta, GA: UNCF Institute for Capacity Building.
- Calder, W., & Clugston, R. (2003). Progress towards sustainability in higher education. [Electronic version]. *Environmental Law Reporter*, 33(1), 10003-10023.
Retrieved from: http://www.ulsf.org/pdf/dernbach_chapter_short.pdf
- Conway, E. (2008). *What's in a name? Global warming vs. climate change*. Retrieved from:
http://www.nasa.gov/topics/earth/features/climate_by_any_other_name.html
- Cowan, K., & Evelyn, J. (2007). The next big boom. [Electronic version]. *Community College Week*, 19(20), 6-8. Retrieved from:
<http://ccweek.com/news/articlefiles/52-CCW060407-WEB.pdf>
- Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Boston: Pearson.
- Estes, R. (1993). Toward sustainable development: From theory to praxis. [Electronic version]. *Social Development Issues*, 15(3), 1-29. Retrieved from:
<http://wenku.baidu.com/view/a0f2721ea76e58fafab0030f.html>
- Feldbaum, M., & States, H. (2008). *Going green: The vital role of community colleges in building a sustainable future and green workforce*. Big Rapids, MI: Academy for Educational Development & National Council for Workforce Education.
- Fraenkel, J. R., & Wallen, N. E. (2009). *How to design and evaluate research in education*. New York: McGraw-Hill.

- Gordon, K., & Hays, J. (2008). *Green-collar jobs in America's cities: Building pathways out of poverty and careers in the clean energy economy*. Washington, DC: Apollo Alliance & Green For All.
- Jorgensen, H. (2006). A green campus culture in Wisconsin. *Techniques: Connecting Education and Careers*, 81(4), 23-25.
- Kennedy, M. (2009). Green as the new norm. *American School & University*, 81(6), 16-23.
- Kimes, M. (2009). Get a green job in two years. [Electronic version]. *Fortune*, 160(10), 32. Retrieved from:
http://archive.fortune.com/2009/11/16/news/economy/community_colleges_green_jobs.fortune/index.htm?cnn=yes
- McCrea, B. (2012). Project profile: Crowder College's 'role model' for green campus facilities. [Electronic version]. *Campus Technology*, 25(8), 1-3. Retrieved from:
<http://campustechnology.com/articles/2012/04/24/project-profile-crowder-colleges-role-model-for-green-campus-facilities.aspx>
- Mississippi Energy & Industrial Construction Consortium. (2009). *Green energy in Mississippi: Opportunities for green energy investment, economic development, and employment growth in Mississippi*. Retrieved from:
<http://www.cewd.org/greendocs/msgreenenergy.pdf>
- National Association of State Directors of Career Technical Education Consortium. (2010). *Proposed green/sustainability knowledge and skill statements*. Retrieved from: <http://www.careertech.org/sites/default/files/GreenSustainability-K%26S-Statements.pdf>

- Ong, P. M., & Patraporn, R. V. (2006). *The economic development potential of the green sector*. UCLA: The Ralph and Goldy Lewis Center for Regional Policy Studies.
Retrieved from: <http://escholarship.org/uc/item/4hn8417m>
- Rogers, S. (2012, July 25). *What is green energy?* Retrieved from:
<http://www.mnn.com/earth-matters/energy/stories/what-is-green-energy>
- Rowe, D. (2002). Environmental literacy and sustainability as core requirements: Success stories and models. In W. L. Filho (Ed.), *Teaching sustainability at universities*. New York: Peter Lang.
- Stern, P. (2000). Toward a coherent theory of environmentally significant behavior. [Electronic version]. *Journal of Social Issues*, 56(3), 407-424. Retrieved from:
https://www.uni-goettingen.de/de/document/download/.../08_stern_2000.pdf
- Stevenson, G. (2005). The future is green: Tribal college saving water, electricity—money. *Tribal College Journal of American Indian Higher Education*, 17(2), 10-15.
- Stewart, M. (2010). Transforming higher education: A practical plan for integrating sustainability education into the student experience. [Electronic version]. *Journal of Sustainability Education*, 1. Retrieved from:
<http://www.jsedimensions.org/wordpress/wpcontent/uploads/2010/05/Stewart2010.pdf>
- Stone, J. R., III. (2010, March). It isn't easy being green, or is it? [Electronic version]. *Techniques: Connecting Education and Careers*, 85(3), 42-45. Retrieved from:
http://www.nrccte.org/sites/default/files/external-reports-files/techniques_stone_it_isnt_easy_being_green.pdf

The City University of New York. (2013). BMCC conducts sustainable living survey.

Campus Sustainability News. Retrieved July 20, 2013 from

<http://www1.cuny.edu/mu/sustainable-news/2013/03/12/bmcc-conducts-sustainable-living-survey/>

The Princeton Review & U.S. Green Building Council (2010). *The Princeton Review's guide to 286 green colleges*. New York: Random House.

United Nations Environment Programme. (2009). *Issues paper prepared for the global platform for disaster risk reduction, June 2009: The role of ecosystem management in climate change adaptation and disaster risk reduction*. Retrieved from:

http://www.preventionweb.net/files/9685_UNEPissuespaperonecosysmgmtCCADRR.pdf

United States Environmental Protection Agency. (2013). *Glossary of climate change terms*. Retrieved from: <http://www.epa.gov/climatechange/glossary.html>

Walla Walla Community College. (2009). *Walla Walla Community College Walla Walla campus sustainability plan*. Retrieved from:

http://www.wbcc.edu/CMS/uploads/media/Approved_WWCC_Sustainability_Plan.pdf

Yin, R. K. (2009). *Case study research: Design and methods*. Los Angeles: SAGE Publications, Inc.

APPENDIX A
PERMISSION LETTER FROM INSTITUTIONAL REVIEW BOARD AT
MISSISSIPPI STATE UNIVERSITY

Study 14-195: An Assessment of Environmentally Sustainable Guidelines at Community and Junior College Campuses in Mississippi

1 message

nmorse@orc.msstate.edu <nmorse@orc.msstate.edu>
To: esd9@msstate.edu
Cc: nmorse@orc.msstate.edu, ads124@colled.msstate.edu

Fri, Jun 6, 2014 at 12:18 PM

June 6, 2014

Suzanne Davis Strehle
Leadership and Foundations

RE: HRPP Study #14-195: An Assessment of Environmentally Sustainable Guidelines at Community and Junior College Campuses in Mississippi

Dear Ms. Strehle:

The review of your study referenced above has been completed. While we sincerely appreciate the submission of your study, it was determined from the review that it does not meet the regulatory definitions for human subjects research. Therefore, HRPP approval is not required as the study is currently designed.

The regulatory definition of human subject is listed below:

45 CFR 46.102(f) Human subject means a living individual about whom an investigator (whether professional or student) conducting research obtains:

- (1) Data through intervention or interaction with the individual, or
- (2) Identifiable private information.

Because your study does not collect information about a living individual (i.e., human subject), the project does not meet the regulatory definition of human subject.

If in the future your study is revised such that it meets this definition, it must be submitted for HRPP review and approval prior to the conduct of such human subjects research.

If you have questions or concerns, please contact nmorse@orc.msstate.edu or call 662-325-5220.

Sincerely,

Nicole Morse, CIP
IRB Compliance Administrator

cc: Dan Stumpf (Advisor)

APPENDIX B

PERMISSION LETTER FROM MISSISSIPPI ASSOCIATION OF COMMUNITY
AND JUNIOR COLLEGES (MACJC)- PRESIDENTS' ASSOCIATION

From: **Debra West** <dwest@mccb.edu>
Date: Monday, July 14, 2014
Subject: MACJC Research Application
To: Elizabeth Davis-Strehle <esd9@msstate.edu>
Cc: Debra West <dwest@mccb.edu>

Suzanne,

I am pleased to inform you that Dr. Johnny Allen, chair of the MACJC, has approved your research application. This email will serve as your official approval until I am able to secure Dr. Allen's signature. I will email you your signed copy after the August MACJC meeting.

Important:

Please initiate institutional contact through each college's Department of Institutional Research. Those offices are equipped to ensure you meet any local approvals that may be required and they will facilitate your contact with appropriate personnel at each of the colleges. Those points of contact can be found in the attached spreadsheet.

We would love to see your results when you have completed your study. If it is possible to email me a link to your dissertation, I will share your results with our colleges.

Please let me know if you have any questions and good luck on your research!

Debra

Debra West, Ph.D.

Deputy Executive Director | Programs & Accountability

Mississippi Community College Board

3825 Ridgewood Road | Jackson, MS 39211

Phone: 601-432-6251 | Fax: 601-432-6363

www.mccb.edu

Signatures

Principal Investigator - I certify that the information in this application is complete and correct. As Principal Investigator, I have the ultimate responsibility for protecting the rights and welfare of human participants, secure conduct of the research, and the ethical performance of the project. I will comply with all applicable federal, state, and local laws regarding the protection of participants in human research.

Research Advisor - I certify that the information in this application is complete and correct, and that this proposed research has been approved by the IRB of the sponsoring institution. As Research Advisor, I confirm that the student researcher under my guidance is knowledgeable about the regulations and policies governing research with human subjects, and has sufficient training and experience to conduct the research outlined in this application.

I further agree to regularly meet with the student researcher to monitor his or her progress; and if problems arise, I will become personally available to help the student researcher resolve those problems. As an advisor on this project, I will assure the protection of the rights and welfare of human participants, secure conduct of the research, and the ethical performance of the project. I will comply with all applicable federal, state, and local laws regarding the protection of participants in human research.

Department Chair - I acknowledge that this research is in keeping with the standards set by our department and our institutional IRB or its equivalent. I also certify that the Principal Investigator has met all the departmental and institutional requirements for approval of this research.

MACJC Chair - I acknowledge on behalf of the MACJC Presidents' Association that this research has been reviewed and has subsequently received the following recommendation by consensus of the Association membership:

- Approved Tabled for Further Review Not Approved
 Approved with Stipulations:

APPENDIX C

PERMISSION LETTER FROM INSTITUTIONAL REVIEW BOARD AT COPIAH-
LINCOLN COMMUNITY COLLEGE

Posey, Jeff <Jeff.Posey@colin.edu>
To: Elizabeth Davis-Strehle <esd9@msstate.edu>

Wed, Jul 23, 2014 at 3:40 PM

Dear Elizabeth,

Yes, it is a very good topic, and I am very interested in your findings as well. Your study is approved at Co-Lin.

Thanks,

Jeff

Michael J. Posey, Ed.D.
Director of Institutional Planning and Research
Copiah-Lincoln Community College
Post Office Box 649
Wesson, Mississippi 39191

APPENDIX D
PERMISSION LETTER FROM INSTITUTIONAL REVIEW BOARD AT
ITAWAMBA COMMUNITY COLLEGE



August 21, 2014

Suzanne Davis Strehle
2617 Cold Springs Road
Sardis, MS 38666

Re: IRB Approval
An Assessment of Environmentally Sustainable Guidelines at Community and Junior College
Campuses in Mississippi

Dear Suzanne Strehle:

The above referenced project/research topic was reviewed and approved on August 21, 2014.
This project is approved until December 31, 2014.

At this point in time, ICC has no formalized sustainability guidelines to offer for your research request as specified in the submitted IRB. You are now given permission to solicit environmental sustainability information regarding ICC from one of our personnel who works outside my office. This qualitative information can probably be acquired by contacting Dr. Michelle Sumerel, dean of eLearning. She worked on a project for ICC where the institution gained environmental certifications and has access to the details of this effort.

Good luck to you in conducting this research project. If you have questions or concerns, please contact me at 662-862-8265 or at etedwards@iccems.edu.

Sincerely yours,

Liz Edwards
Director of Institutional Research, Effectiveness, & Accountability

APPENDIX E
PERMISSION LETTER FROM INSTITUTIONAL REVIEW BOARD AT MERIDIAN
COMMUNITY COLLEGE

Parker, Cathy <cparker@mcc.cc.ms.us>
To: Elizabeth Davis-Strehle <esd9@msstate.edu>

Wed, Jul 23, 2014 at 12:32 PM

Hi Elizabeth,

Consider this email to serve as approval to conduct your research at Meridian Community College. There is nothing further that needs to be done.

Let me know if I can be of assistance.

Cathy Parker

Sent from Surface Pro

APPENDIX F
PERMISSION LETTER FROM INSTITUTIONAL REVIEW BOARD AT
NORTHWEST MISSISSIPPI COMMUNITY COLLEGE

INFORMED CONSENT. Consent forms are present or will be used where necessary – If human subjects are being used, the informed consent must be included as an attachment. It is especially important that the document indicate that subjects are free to participate or not.

- Yes
- No

DESIRED TIME FRAME: Please indicate the desired time frame of the research. Please keep in mind that the actual time frame approved will be coordinated through the Office of Institutional Research and Effectiveness.

FROM: July 25, 2014 **TO:** December 31, 2014

PRINCIPAL INVESTIGATOR - I certify that the information in this application is complete and correct. As Principal Investigator, I have the ultimate responsibility for protecting the rights and welfare of human participants, secure conduct of the research, and the ethical performance of the project. I will comply with all applicable federal, state, and local laws regarding the protection of participants in human research.

APPROVAL:

DIRECTOR OF INSTITUTIONAL RESEARCH - I acknowledge that this research has been reviewed and has subsequently received the following recommendation:

- Approved
- Tabled for Further Review
- Not Approved
- Approved with Stipulations

APPENDIX G

MISSISSIPPI COMMUNITY AND JUNIOR COLLEGE WEBSITES

MISSISSIPPI COMMUNITY AND JUNIOR COLLEGE WEBSITES

Copiah-Lincoln Community College	http://www.colin.edu
Hinds Community College	http://www.hindscc.edu
Itawamba Community College	http://www.iccms.edu
Meridian Community College	http://www.meridiancc.edu
Northeast Mississippi Community College	http://www.nemcc.edu
Northwest Mississippi Community College	http://www.northwestms.edu