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Student Motivation for Pursuing a Minor in Environmental Sustainability

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STUDENT MOTIVATION FOR PURSUING A MINOR IN ENVIRONMENTAL
SUSTAINABILITY

STUDENT MOTIVATION FOR PURSUING A MINOR IN ENVIRONMENTAL
SUSTAINABILITY

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Education in Workforce Development Education

By

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Abstract

Environmental sustainability dominates the global conversation seeking to increase awareness and change the culture of thinking concerning the relationship between humans and the Earth. Because many universities offer programs relative to environmental sustainability, a need exists to understand why students pursue these programs. This study examined student motivation for pursuing an environmental sustainability minor in one institution of higher education. Career, learning, monetary, and social responsibility were the motivational factors considered in this study. The results of this study indicated significant differences among the motivational factors for pursuing a minor in sustainability among those students surveyed. Significant differences existed for female and male participants. Significant differences also existed based on the student's major program of study in the College of Agriculture, Food, and Life Sciences and the College of Arts and Sciences. A significant difference in motivational factors did not exist for students in the School of Architecture, the College of Business, or the College of Engineering.

This dissertation is approved for recommendation to the Graduate Council.

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Dedication

I dedicate this project to all of the people that start out to save the world in one way or another. Everyday life can sidetrack even the best intentions. I am hopeful that we all have the inspiration to stay on track or get back on track and achieve our goals.

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Chapter One

Introduction

Concern for the relationship between humans and the Earth stimulated the environmental movement. Pursuing an academic program of study in environmental sustainability indicated student motivation to participate in this movement (AASHE, 2012e). This study examined the factors motivating this pursuit.

Status of the Environmental Sustainability Issue

Rachel Carson's *Silent Spring* is generally credited with launching the environmental movement. Published in 1962, "Carson's writing initiated a transformation in the relationship between humans and the natural world and stirred an awakening of public environmental consciousness" (Lear, 2002, p. x). Rooted in the early 1960's, the environmental movement has been referred to by many names that include conservation, ecology, and most recently environmental sustainability. Conservation is defined as "the study of the loss of Earth's biological diversity and the ways it can be prevented" (Conservation, 2012, p. 1). Ecology, the study of the inorganic aspects of the environment and the interrelationships of organisms with their environment and each other added a systems view to the conservation movement (Ecology, 2012). The environmental sustainability movement can trace its inception to the United Nations Conference on the Human Environment in Stockholm, Sweden, in 1972. Government regulations protecting the environment in the United States evolved with the formation of the Environmental Protection Agency (EPA) in 1970. Brundtland's report, *Our Common Future*, defined sustainability as "meeting the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987, p. 1). The 1992 United Nations Conference on Environment and Development encouraged collaboration between nations to

protect the vitality of the Earth and to ensure the survival of our planet and our civilization resulting in “harmony with nature” (United Nations, 2011, p. 1). Continued and increased awareness of the environmental sustainability issue is crucial to the “successful recovery of the climate balance and ecological integrity” (Gore, 2009, p. 12).

Sustainability in Business and Industry

Private sector involvement in sustainability is reflected by various efforts to promote good corporate citizenship by demonstrating social responsibility. The private sector involvement is exemplified by attempts to integrate economic benefits for the stakeholders, corporate social responsibility, and meeting ethical obligations (Maass, 2007).

In addition to the social contributions of applied sustainability efforts, an abundance of research examined the link between corporate social responsibility (CSR) and financial benefit (Cameron, 2012). Additionally, a study by Verbenko (2011) found that private sector companies that value their shareholders and consumers tend to be more concerned with corporate social responsibility. In addition to being motivated to meet the EPA’s government regulations, business and industry seized the opportunity to also be socially responsible. Corporate social responsibility continued to evolve becoming a competency for successful organizational development practitioners (Maass, 2007).

Career opportunities have been created by sustainability jobs that target America’s infrastructure which cannot easily be outsourced to other countries (Gore, 2009). The American Recovery and Reinvestment Act of 2009 facilitated jobs focusing on weatherizing American homes and buildings, road and bridge construction and repair, scientific research, and broadband and wireless Internet expansion (U.S. Government, 2012). The United States Department of Energy web site stated “Clean energy is leading the way for greater innovation, more sustainable

jobs, and partnerships that are driving workforce development” (U.S. DOE, 2012, para.1). Ongoing and escalating environmental challenges have shifted the importance of sustainability from being a part of an environmental movement to an important business practice that is a “source of opportunity, innovation and competitive advantage” (Babiak & Trendfilova, 2010, p. 21).

Sustainability and Higher Education

American College and University Presidents Climate Commitment.

Given that the goal of higher education is to serve the greater good by educating leaders to adapt and align to meet the needs of society, institutions of higher education are uniquely situated to be leaders in the environmental sustainability effort (Arbo & Benneworth, 2007). Higher education promotes sustainability not only in its curriculum, but also by modeling environmental sustainability practices on campus. Established in 2007, the American College and University Presidents Climate Commitment (ACUPCC) is a network of colleges and universities that functions as a resource for universities, which serve as community role models and educate leaders to pursue sustainability. This network, originally founded by twelve university presidents, now has 677 signatories and is still growing.

ACUPCC institutions agreed to (a) complete a Greenhouse Gas emissions online inventory tool provided by ACUPCC to determine the university’s carbon footprint; (b) set a target date and interim milestones for becoming climate neutral within two years; (c) immediately reduce greenhouse gas emissions by choosing from a list of short-term actions; (d) integrate sustainability into the curriculum and make it part of the educational experience; and (e) make the action plan, inventory and progress reports publicly available (American College & University Presidents’ Climate Commitment, 2012).

Association for the Advancement of Sustainability in Higher Education.

The Association for the Advancement of Sustainability in Higher Education (AASHE) was founded to “empower higher education to lead the sustainability transformation” (AASHE, 2012a, p. 1). AASHE membership is available to educational institutions and non-profit organizations within the United States, Canada, and Mexico. AASHE member institutions can access services, experts, assistance with reduction of greenhouse gas emissions, best educational practices, and the Sustainability Tracking, Assessment and Rating System (STARS).

The Association for the Advancement of Sustainability in Higher Education’s current membership includes 203 two-year educational institutions and 582 four-year educational institution members from the United States. International institutional membership includes 20 two-year institutions and 56 four-year institutions. Countries included in the international memberships are Australia, Canada, China, Denmark, Dominican Republic, Egypt, Fiji, Guatemala, India, Jamaica, Republic of Korea, Mexico, Qatar, South Africa, Switzerland, and the United Kingdom. Members of AASHE self-report data concerning academic programs offered (AASHE, 2012c).

National Wildlife Federation and Higher Education.

The National Wildlife Federation (NWF) is a non-profit, member-supported, conservation organization committed to motivating Americans to protect nature for future generations. This organization voices its concerns by stating “global warming, the loss of habitat, and people becoming more disconnected from nature than past generations are converging on a dangerous path for our planet” (National Wildlife Federation, 2012, p. 1). When dramatic policy changes in the business world along with global warming or climate change evolved into a national topic of conversation, the National Wildlife Federation felt

prompted to monitor higher education's progress and "challenge American higher education to keep pace and ultimately to lead in the realm of the environment and sustainability" (National Wildlife Federation, 2008, p. 2). The National Wildlife Federation recognizes that higher education in the United States "plays important roles by both being part of a changing world and also actively shaping the future direction of that world" (National Wildlife Federation, 2008, p. 2). The National Wildlife Federation Report Cards developed in 2001 and 2008 measured the sustainability status of higher education institutions on levels of management, academics, and operations.

Environmental Sustainability Curriculum.

Environmental sustainability curriculum varies among university programs. Minor programs of study generally begin with an introductory or foundational course and some end with a capstone project. Many of these programs utilize an interdisciplinary model that enables universities to utilize existing courses and faculty members and facilitates collaboration between students of many different academic disciplines and degree programs (AASHE, 2012e). Introductory courses typically cover the basics of sustainable development, implementation opportunities, and environmental sustainability's integration with other educational content areas. An interdisciplinary model "would be one in which faculty have developed a common approach to common problems that is distinct from those of the traditional disciplines" (Miller, & McCartan, 1990, p. 30). Once a framework is established, most programs allow students to build their own academic plan by pursuing courses from thematic areas which include topics such as biology, geology, environmental design, global warming, social and economic policy, and architecture. Most capstone experiences occur at the end of all coursework and are intended to facilitate the synthesis and analysis of all courses and provide an opportunity for the student to

make tangible applications of the learning. Capstone experiences can include service-learning projects, short-term field experiences, or internships (AASHE, 2012c).

Problem Statement

Environmental sustainability has become a part of the global conversation that is focused on changing the culture of thinking in order to increase awareness concerning the relationship between humans and the Earth. Because many universities offer programs relative to environmental sustainability, a need exists to understand why students pursue these programs. This study examined factors that motivated students to pursue an environmental sustainability minor in one institution of higher education.

Purpose of the Study

The purpose of this study was to identify the factors that motivated undergraduate students at the University of Arkansas, a land grant institution in the South, to pursue a minor in sustainability.

Research Objectives

To identify what factors motivated undergraduate students to pursue an academic program related to environmental sustainability, the following research questions guided this study:

1. Do significant differences exist among the variables of career, monetary, learning, and social responsibility and a student's decision to pursue a minor in sustainability?
2. Is there a significant difference in student motivation for pursuing a minor in sustainability based on the students' gender?
3. Is there a significant difference in student motivation for pursuing a minor in sustainability based on the students' major of study?

Significance of the Study

This study was significant because it identified which factors were significant in motivating students for pursuing a minor program in sustainability among students enrolled in introductory courses for this minor program of study. While there is substantial literature that examines student motivation and the selection of academic programs (Dierberger, 1998; Rogers, 2008), few studies focus specifically on factors that influence student motivation for selecting sustainability related majors or minors. Little is known about what motivates students to select an academic program specifically in sustainability. Therefore, this study contributes new knowledge relative to sustainability education and student motivation.

Research Design

In this non-experimental quantitative study, undergraduate students enrolled in two introductory sustainability courses were surveyed to ascertain their motivations for declaring or planning to declare sustainability as an academic minor. Purposeful sampling was used to select participants for this study. By surveying students enrolled in the Foundations of Sustainability and Applications of Sustainability courses, the researcher had access to the majority of students who were potentially pursuing the Foundations in Sustainability minor at the research site.

Conceptual Framework

Student motivation theory informed the research design of this study. Therefore, this study draws on the findings of previous research (Dierberger, 1998; Rogers, 2008; Fieselman, 2011) that suggest that factors which motivate the selection of academic programs include career, monetary, learning, and social responsibility. These factors provided the framework for the survey that was administered to undergraduate students enrolled in introductory courses at

the research site. The subsequent data analyses examined the relationship of these factors and select demographics.

Delimitations, Limitations, and Assumptions

The fact that participants in this research were students from one sustainability minor program at a single university is a delimitation of this study. Students currently enrolled in two introductory courses required for the minor were surveyed.

Another delimitation of this study involved the method of sampling, which was convenience sampling for the target population, and the possibility of a small sample size. A small sample size would be encountered at other universities since this is a new minor at most universities.

Limitations to this study include this academic minor program of study itself, changes by students, and possible unmeasured motivations. At the research site, this minor program of study called the Foundations of Sustainability minor became available to students in the fall of 2011. Because this program is relatively new, only approximately 100 students have declared this as their minor program of study. No students have graduated with this minor at this time. In addition, a student's decision to pursue a declared major or minor program of study may change at any time. Student motivation may change. The instrument did not measure all aspects of motivation. Therefore, all data collected and analyzed may or may not be generalizable to other institutions or programs of study.

Assumptions of this study related to the student participants. It was assumed that students participating in the survey answered honestly and seriously. Additionally, student participants needed to feel comfortable answering the anonymous survey. Students in the fall

class did not repeat the survey in the spring class which was also addressed during survey distribution.

Operational Definitions

For the purpose of this study, the following define key terminology.

Capstone is a culminating experience at or near the end of an academic program.

Career refers to the student's perception of their future role in the workforce.

Corporate social responsibility refers to a company self-regulating its actions to be responsible and have a positive influence on the environment.

Environmental sustainability literacy is a "basic understanding of the concepts and knowledge of the issues and information relevant to the health and sustainability of the environment as well as environmental issues related to human health" (Wolfe, 2001, p. 302).

Green or going green refers to reduction of the environmental impact.

Interdisciplinary course content is based upon contributions, collaboration, and instruction from faculty members from multiple colleges within a university.

Learning refers to knowledge of the issues and information relevant to environmental sustainability.

Major program of study was reduced from a long list of many possible majors and grouped by colleges at the University of Arkansas:

-Dale Bumpers College of Agricultural, Food and Life Sciences

-Fay Jones School of Architecture

-J. William Fulbright College of Arts and Sciences

-Sam M. Walton College of Business

-College of Education and Health Professions

-College of Engineering

-Other/do not know/choose not to answer.

Monetary refers to tangible compensation of salary, benefits, retirement plans, and so forth.

“*Motivation* can be defined as that urge or push to carry out a specific action or behavior”

(Brouse, Basch, LeBlanc, McKnight, & Lei, 2010 p.1). Based on the review of literature,

motivation for this study is specifically related to career, monetary, learning, and social responsibility.

Social responsibility is a feeling of responsibility to engage and contribute to society whether on a global, community, or personal level.

Sustainability means meeting “the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland, 1987, p. 1).

Sustainability minor is a minor degree that is awarded based on completion of required coursework leading to sustainability literacy. Most programs are interdisciplinary and address themes.

Chapter Two

Review of Literature

Environmental sustainability has implications for the private sector, educational institutions, and the community at large. This study examined motivational factors that influenced undergraduate students' choice to pursue an academic program in environmental sustainability. In addition to searching for scholarly studies germane to environmental sustainability degree programs, the researcher also mined the literature for studies relevant to student motivation and academic selection.

The review of literature provided both the context and the conceptual framework for this study. The following sections discuss the interdependence of environmental sustainability, sustainability and higher education, and student motivation for pursuing an academic program of study.

The Literature Review Process

Literature for this study was acquired from the Mullins Library at the University of Arkansas and Boreham Library at the University of Arkansas Fort Smith. Interlibrary loan through Mullins Library supplemented materials unavailable at local libraries. Literature included peer-reviewed journal articles, published dissertations, and government, institution and organization web sites. Primary academic search engines used included ProQuest Direct Dissertations and Theses, JSTOR (Journal Storage), and EBSCO Academic Search Premier. The library catalogs of Mullins Library and Boreham Library were essential for the location of journals and books. In order to search academic data bases and library catalogs, key words and phrases included corporations, economic benefits, sustainability, environmental sustainability,

ecology, conservation, motivation, student motivation, major program of study, minor program of study, career, learning, social responsibility, monetary, corporate social responsibility, intrinsic motivation, extrinsic motivation, organic leadership, green education, capstone, interdisciplinary, sustainable development, energy, alternative energy resources, and environmental education. Web sites of organizations, government agencies, and higher education institutions were instrumental in the location of data concerning current practices in environmental sustainability in higher education institutions, the private sector, and communities.

Environmental Sustainability

A multitude of events sparked the environmental movement in the United States including Rachel Carson's *Silent Spring*, fires on polluted rivers, the first Earth Day, and the formation of the Environmental Protection Agency (U.S. EPA, 2013). Simultaneously, the publication of the World Conservation Strategy called the World Charter for Nature gave evidence of the United Nations's awareness of sustainable development which led to the creation of the World Commission on Environment and Development (United Nations, 2011). Initiated by the 1983 World Commission on Environment and Development (WCED), Gro Harlem Brundtland chaired a group that developed the 1987 report known as *Our Common Future*. Evolving from this report, the definition of environmental sustainability and sustainable development refers to maintaining a balance with nature in order to meet present needs without jeopardizing the needs and/or survival of future generations (Brundtland, 1987). "Green" and "going green" and "sustainable" were terms commonly used when referring to reduction of the environmental impact. Strategies to achieve going green include improved energy efficiency along with reduction in consumption, using sustainable materials and eliminating or reducing

waste, complying with government environmental regulations, and buying environmentally friendly materials (Environmental Management Assistance Program, 2013). Goodland (1995) stated that beginning in the mid 1960's economists debated the issues of unlimited growth on an earth with limited resources. Most economists felt that this debate over carrying capacity would be resolved due to interventions from scientific resourcefulness and progress. Politicians felt that implementing a sustainable approach is "politically unacceptable" (Goodland, 1995, p. 14). The formation of the Environmental Protection Agency (EPA) in 1970 facilitated many government regulations such as the Clean Air Act of 1970, the Clean Water Act of 1972, the Energy Policy and Conservation Act of 1975, and many more (U.S. EPA, 2013). Preston (2001) chronicled the progression of sustainability from the 1980's concerns of control and prevention of pollution to the 1990's concerns to meet regulations of the Environmental Protection Agency (EPA) culminating with stating that sustainability is a strategic imperative for all 21st Century businesses. The National Environmental Education Act of 1990 was established with the goal that increasing public awareness and knowledge would facilitate public responsible decisions and actions (U.S. EPA, 2013). The 1992 United Nations Conference on Environment and Development (UNCED) also known as the Earth Summit expanded efforts to international global environmental protection and sustainable development (U.S. EPA, 2013).

A purposeful, proactive strategy was vital to achieving such goals. Increased awareness and education has driven environmental sustainability efforts both in educational institutions, the private sector, and the community. Cortese (2003) emphasized the importance of increasing awareness of environmental sustainability since the majority of humans are not aware of their own ecological footprint, which is vital to the realization of its impact. Environmental sustainability continues to be a topic of discussion. In addition to peer-reviewed research,

Friedman and Gore authored influential books that have been well accepted by the popular press. Both of these books have helped increase awareness in the public, reaching individuals that higher education most likely will not include. In *Hot, flat, and crowded*, Friedman (2008) showed a link between America's loss of focus and national purpose and the global environmental crisis. Friedman (2008) called for America to seize the chance to lead the world in "Code Green" strategy for preventing an unstable Earth in the future while bringing America back to its best (Friedman, 2008).

Gore's (2009) *Our Choice* went a step further with a plan for collaboration of individuals and countries to implement solutions to the causes of our climate crisis. Gore defined the crisis itself and the sources of energy available today, addressed the living systems impacted by energy use and how we use energy, and then concluded with the obstacles faced by this plan and steps for implementation. This book sounded as a call for readers to take action using existing tools to solve the climate crisis for current and future generations. Gore addressed the creation of jobs in America's workforce that cannot be outsourced (Gore, 2009).

Sustainability in Business and Industry

Corporations and the environment.

Business and industry are key players in sustainable development and environmental sustainability. Careers have been positively impacted by the creation of sustainability jobs targeting America's infrastructure, jobs that cannot easily be outsourced to other countries (Gore, 2009). The American Recovery and Reinvestment Act of 2009 incentivized jobs focusing on weatherizing of American homes and buildings, road and bridge construction and repair, scientific research, and broadband and wireless Internet expansion (U.S. Government, 2012). The United States Department of Energy web site stated "Clean energy is leading the way for

greater innovation, more sustainable jobs, and partnerships that are driving workforce development” (U.S. DOE, 2012). As evidence of the power of corporations to effect change, Vormedal (2011) analyzed climate change politics in the United States between 1990 and 2010. Lobbyists for business and industry had a powerful effect on environmental policy and provided an obstacle to this progress until 2008. Driven by uncertainties of government regulations and new market opportunities, corporations shifted their strategy from resistance to support for regulations supportive of climate change concerns in the United States (Vormedal, 2011). Creating and following policies concerning environmental sustainability require a shift in thinking and corporate culture. Permanently changing the way decisions are made, the way people work within an organization, and the common target goal are vital to protecting the future of a business and simultaneously protecting the environment (Cameron, 2012).

Economic benefits to corporations and the environment.

Benefits exist for corporations as their efforts toward environmental sustainability are rewarded. Benefits include integration of social, environmental, and economic responsibility, empowerment of employees, and transformational change. An additional benefit was a change of attitudes toward the stakeholders that include people, planet, and profit (Dos Santos, M. A.O., Svensson, G., & Padin, C., 2013). Assessment served as an indicator of the importance of economic benefits to both the corporation and the environment and monitored a successful balance between environmental and economic outcomes (Zhang, Joglekar , & Verma, 2012). Ultimately, efficient management of expenses and profit for the business delivered a tangible economic benefit by controlling costs, protecting the business and ensuring sustainability (Cameron, 2012).

Investing in sustainability.

Members of the private sector of business and industry view sustainability as a worthwhile endeavor that address beneficial investments, public relations, and collaborative opportunities. Green mutual funds underperform compared to traditional mutual funds (Chang, Nelson, & Witte, 2012). Nevertheless, Fields (2002) recognized that businesses and industry see sustainability as an investment. Businesses feel pressure to incorporate initiatives to remain competitive, to meet international regulations, and to attract the best recruits and retain employees (Fields, 2002). Dedication to investing time and money in leadership training “in corporate responsibility, environmental sustainability, and social justice” enhances the performance of the organization and increases the opportunity for positive financial rewards (Cox, 2005, p. ii). Currently green investments are gaining popularity but a standard definition of a green investment does not exist. Once a standard exists, green funds may become more competitive (Chang, Nelson, & Witte, 2012).

Ethical obligations.

In addition to seeing sustainability as an investment, businesses are beginning to see it as being socially responsible. Theorists have influenced business and industry have developed the concept that “human and natural capital including environmental resources is viewed as a finite resource rather than a limitless free supply” (Fields, 2002, p. A144). Private sector involvement in sustainability activities is reflected by corporate efforts to promote good corporate citizenship through social responsibility. Private sector companies that value their shareholders and consumers tend to be more concerned with corporate social responsibility (Verbenko, 2011). The greening of business and industry in order to meet government regulations made corporate social responsibility (CSR) politically advantageous. Corporate social responsibility

continued to evolve, becoming an expected competency for successful organizational development practitioners (Maass, 2007).

Members of the private sector “must also be encouraged to take responsibility for a sustainable future. They must be mobilized so that they will actively participate in giving shape to sustainable development” (Martens, 2006, p. 41). Babiak and Trendafilova (2011) went beyond corporate social responsibility renaming this and “focusing specifically on corporate environmental responsibility” (p. 11). Although this study involved sports organizations, the results transferred to other organizations given that collaboration between businesses, government, and non-profits is the solution for addressing “social and environmental challenges” (Babiak & Trendafilova, 2011, p. 21). Supportive of these needs in business and industry, master’s of business administration programs in higher education move toward an integration of ethics, corporate social responsibility, and sustainability (Christensen, Peirce, Hartman, Hoffman, & Carrier, 2007).

Sustainability and Higher Education

Higher education is pivotal to successfully implementing government environmental sustainability policies such as those established by the United States Environmental Protection Agency. Simply making a policy that will regulate natural resources and impact environmental sustainability will not change behaviors or address prevention. Education is needed to address both improved policy making and changes in behaviors (Stables, 2010). Higher education serves a social purpose and academic purpose concerning environmental sustainability. The social purpose for higher education is to serve as a model and conduct research. Higher education institutions model environmentally sustainable practices such as recycling, construction of buildings that are Leadership in Energy and Environmental Design (LEED) certified, and

community service projects that can be replicated by communities, neighborhoods, and cities (University of Arkansas, 2012b). Higher education institutions conduct and publish research relative to environmental sustainability (AASHE, 2012c). The academic purpose for higher education institutions provides an opportunity for education to increase awareness of all students and surrounding community members. Additionally, higher education institutions prepare future practitioners who not only are knowledgeable about environmental sustainability, but also have the ability to synthesize and disseminate their learning within their professions in business and industry and community. Developing change agents in multiple major programs of study facilitates dissemination of knowledge into any profession that practitioners end up in.

The tangible role of higher education's American College and University Presidents Climate Commitment (ACUPCC) network had its beginnings in Talloires, France in October 1990. The role of the ACUPCC network is guided by The Talloires Declaration, which "is a ten-point action plan for colleges and universities committed to promoting education for sustainability and environmental literacy" (University Leaders for a Sustainable Future, 2008, para. 5). Participation in this network collaboration prepares universities using the ten-point action plan to facilitate environmentally sustainable development by increasing awareness, creating an institutional culture, educating environmentally responsible and literate citizens, practicing institutional ecology, involving stakeholders, collaborating between disciplines and content areas, enhancing K-12 education, increasing service locally, nationally, and internationally, and building a local support system to monitor progress (University Leaders for a Sustainable Future, 2008). Participation in this network collaboration is reflected by widespread participation: "As of February 2012, the Talloires Declaration has been signed by more than 430

university presidents and chancellors at institutions in over 40 countries across five continents” (University Leaders for a Sustainable Future, 2008, para.7).

Grecho (2008) confirmed the need for academic sustainability programs in higher education. Additionally, educational stakeholders recognize the need to ensure the validity of sustainability programs in the future and are “interested in evaluating the success of academic programs addressing the issue of environmental sustainability” (Grecho, 2008, p. 93). Grecho (2008) predicted that an evaluation framework facilitates the efforts of academic programs to “evolve with changing environmental and societal needs and our own increasing knowledge on the problems we are faced with to address environmental sustainability” (p.11).

The National Wildlife Federation (NWF) is a non-profit, member-supported, conservation organization committed to motivating Americans to protect nature for future generations. This organization voiced its concerns by stating “global warming, the loss of habitat, and people becoming more disconnected from nature than past generations are converging on a dangerous path for our planet” (National Wildlife Federation, 2012, p. 1). When dramatic policy changes in the business world along with global warming or climate change evolved into a national topic of conversation, the National Wildlife Federation felt prompted to monitor higher education’s progress and “challenge American higher education to keep pace and ultimately to lead in the realm of the environment and sustainability” (National Wildlife Federation, 2008, p. 2).

Cortese (2003) emphasized the importance of increasing awareness of environmental sustainability since the majority of humans are not aware of their own ecological footprint, which is vital to the realization of its impact. Cortese (2003) stated that higher education should address sustainability not only in education but also in university operations, research, and the

external community. As an example for implementation in larger communities, institutions of higher education should model “environmentally responsible living and reinforce desired values and behaviors” (Cortese, 2003, p. 16). Transformation of “thinking, values, and action by all of society’s leaders and professionals, as well as the general population” (Cortese, 2003, p. 19) is crucial. In order for this to occur, a change in education at all levels is needed as well. In addition to modeling, leading, and applying the concepts of sustainability, higher educational institutions are responsible for preparing those who “influence society’s institutions, including the most basic foundation of K–12 education. Besides training future teachers, higher education strongly influences the learning framework of K–12 education, which is largely geared toward subsequent higher education” (Cortese, 2003, p. 17). Instructors in K-12 education, leaders in the private sector, and decision-makers in government are products “of the world’s best colleges and universities that are leading us down the current unhealthy, inequitable, and unsustainable path” (Cortese, 2003, p. 16).

Findlay and Massey (2012) offered another example of higher education’s opportunity to model the implementation of sustainability for cities since higher education’s politics and hierarchy are similar but possibly less complex. Findley and Massey (2012) stated, “with a smaller scale and more structured administration, universities can better reduce the cumulative effect of local environmental problems, an area where cities sometimes struggle” (p.151). They propose that higher education campuses seize the “unique opportunity to become innovative green leaders” (p.162). These campuses provide an ideal location as a model ranging from daily operations to academics since “sustainability is a broad and general topic that needs to be better integrated into the economy, society, politics, culture and overarching structure of the university” (Finlay & Massey, 2012, p.162).

Environmental sustainability programs and curriculum.

Interdisciplinary curriculum.

Merging disciplines to create interdisciplinary programs of study will utilize existing professionals and faculty to support collaboration for environmental sustainability. The Association for the Advancement of Sustainability in Higher Education (AASHE) indicates interdisciplinary programs doubled over five years from 2009 to 2012 (AASHE, 2012e). Bezbatchenko (2011) states “looking further to the integration of academics in sustainability efforts, we may be able to better interpret and guide sustainability efforts in colleges and universities” (p. 147). Many major or minor academic programs of study concerning sustainability are appropriately interdisciplinary since “these issues cross over disciplinary boundaries”(Cortese, 2003, p. 16). Preparing students for the ever-changing environmental problems is best facilitated by an interdisciplinary education, which mixes and merges all content areas to better understand the world we live in (Semerjian, El-Fadel, Zurayk, & Nuwayhid, 2004).

Challenges to developing interdisciplinary curriculum.

The National Wildlife Federation recognized that higher education in the United States “plays important roles by both being part of a changing world and also actively shaping the future direction of that world” (National Wildlife Federation, 2008, p. 2). To assist higher education with these challenges, the National Wildlife Federation Report Cards developed in 2001 and 2008 measured the sustainability status of higher education institutions on levels of management, academics, and operations.

“Higher education is generally organized into highly specialized areas of knowledge and traditional disciplines. Designing a sustainable human future requires a paradigm shift toward a

systemic perspective emphasizing collaboration and cooperation” (Cortese, 2003, p. 16). An interdisciplinary model “draws insights from relevant disciplines and integrates those insights into a more comprehensive understanding” (Newell, 2001, p. 2). The traditional atmosphere of higher education does not lend itself to interdisciplinary cooperation and collaboration. Accused by many of working in silos, disincentives exist that serve as barriers for faculty who “are often discouraged from extending their work into other disciplines or inviting interdisciplinary collaboration” (Cortese, 2003, p. 16). This essential type of collaboration is “critical to addressing environmentally sustainable action on local, regional, and global scales over short, medium, and intergenerational time periods. Interdisciplinary education would have the same “lateral rigor” across, as the “vertical rigor” within, the disciplines” (Cortese, 2003, p. 18).

At the University of Arkansas, the implementation of this new minor was driven by research that confirmed a global decrease in environmental quality over the last several years. This research and recent events stimulated “a resurgence in thought regarding ‘sustainability’ and emergence of a widespread movement among academicians to raise awareness of the tenuous environmental situation for the general public as well as constituents at their academic institutions” (University of Arkansas, 2010, p. 1).

Motivational Factors that Influence Choice of Academic Program

While few studies have specifically investigated motivational factors that influence the selection of an academic program in environmental sustainability, one can borrow from the research for other academic programs of study which is applicable to sustainability studies. Research from social science literature indicates that career, monetary, learning, and social responsibility are powerful motivational factors that influence student’s choice of academic program. Due to the purpose of this study and the survey instrument that was used, the

researcher did not identify these factors as either intrinsic or extrinsic. For this study the motivational factors identified and used in the survey instrument are career, monetary, learning, and social responsibility.

Career and monetary motivation.

Research from social science literature indicates that career and monetary were key motivators for students in pursuing a major program of study. Domene, Socholotiuk, and Woitowicz (2011) explored “the effects of career outcome expectations (COE) and aspiration to enter a science, technology, or math (STM) career on post- secondary academic motivation” (p. 99). “Additionally, this study suggested that changes in COE and aspirations for STM occupations may have important implications for post-secondary students’ motivation for their programs of study” (Domene, et al, 2011, p. 117).

Arcidiacono, Hotz, & Kang (2012) determined that the choice of a major academic program of study was critical to the future earnings of college students. Findings of this study “suggest that students’ college major decisions would be guided, in part, by the future earnings streams associated with the different majors” (p. 15). The results of Rogers’s (2008) dissertation also indicated that a motivating factor was based on good job opportunities, good working conditions, good salaries, and status and prestige. Rogers also discussed demographics and correlations to selection of an academic major.

An individual’s expected monetary rewards may actually differ from the actual received compensation in careers based upon gender and/or race. The results of the study conducted by Montmarquette, Cannings, & Mahseredjian (2002) indicated a student’s decision to pursue an academic program is based upon “expected earnings in a particular concentration. However, differences exist in the impact of the expected earnings variable by gender and race. Women are

less influenced by this variable compared to men and nonwhites more than whites” (p. 554-555). Roksa (2005) also found that not all college majors pay the same. Gender can be a factor. Females majoring in careers filled primarily by females will earn lower salaries than females that enter fields that are not dominated by females. Although employment sectors “offer lower monetary rewards, they facilitate access to professional and managerial occupations” (Roksa, 2005, p. 224).

Learning and social responsibility motivation.

According to Rogers’s (2008) dissertation concerning selection of social work as a major program of study service to others ranked higher than other factors such as interest in the job, experiences on the job, and academic challenge of the social work major. In this study, service to others was characterized by descriptions such as contributing to individuals and society and effecting social change, which can be classified as social responsibility. Stables (2010) stated, “critical environmental literacy enables people to understand the underlying issues so that they can modify and develop their own values and stances in relation to them” (p. 149). Learning or environmental literacy is intertwined with social responsibility since “the critically literate person is able to change society and his or her place in it: to be a rational environmental actor as well as a consumer of environmental messages” (Stables, 2010 p. 149).

Dierberger’s (1998) dissertation focused specifically on the selection of environmental studies as a major program of study. The author asserted, “interest in environmental issues, the challenge of solving environmental problems and a desire to make a difference in the environment were factors identified as positively influencing selection of this major” (Dierberger, 1998, p. i). The results indicated that factors that did not influence the choice of

major were external factors such as “family, peers and knowing professionals in the field” (Dierberger, 1998, p. 70). Recruitment for students in an environmental studies program should address the finding that the selection of this “major resulted from an interest that developed at a young age” (Dierberger, 1998, p. 75).

Hawkins (2005) studied whether learning during a capstone course impacted the attitudes, motivation, and actions of students and discovered that “it did promote learning and the action that occurs in conjunction with learning” (p. 83). A connection between learning during the students’ upbringing was noted. Actions or behaviors such as recycling had a higher retention if the student had been exposed to this learning or behavior during their childhood. Responsibility can also motivate the behaviors of students and “higher education can remind students that they should give back to society; graduates have the ability and, perhaps the duty as educated people, to be leaders” (Hawkins, 2005, p. 83).

Summary

This chapter discussed the literature review process, the beginning and evolution of environmental sustainability. The review of literature discussed the relationship of sustainability to business and industry and the relationship of sustainability and higher education. Research existed examining student motivation for pursuing or selecting a certain major or minor program of study. Student motivation in this research revealed specific motivational factors concerning future career, monetary rewards, learning for the sake of learning, and social responsibility.

Chapter Three

Methodology

The purpose of this non-experimental quantitative study was to examine student motivation for pursuing an environmental sustainability minor. While the review of literature demonstrates that the private sector is very active in the sustainability movement, this study focused on identifying the motivational factors that influenced students to pursue an environmental sustainability minor in higher education. This chapter discusses the study's research design, the site and sample selection, the rationale for selection, instrumentation, human subjects considerations, data collection procedures, and data analysis for questions or objectives.

Research Design

To answer the research questions, a non-experimental quantitative study was developed. A survey was developed utilizing previous research conducted to examine student motivation for selection of an academic program of study. Undergraduate students enrolled in two introductory sustainability courses were surveyed to ascertain their motivations for declaring or planning to declare sustainability as an academic minor. Purposeful sampling was used to select participants for this study. By surveying students enrolled in the Foundations of Sustainability and Applications of Sustainability courses, the researcher had access to the majority of students who were potentially pursuing the Foundations of Sustainability minor at the University of Arkansas.

Site and Sample Selection

Selection of Study Site.

The University of Arkansas (U of A) is the only higher education institution in the state that offers a minor in sustainability. The undergraduate enrollment for the U of A was approximately 20,000 students at the time of the study. Located within the southeastern region

of the United States, the U of A is classified as a public research university with very high research activity by the Carnegie Foundation for the Advancement of Teaching (Carnegie Foundation for the Advancement of Teaching, 2012), and offers an interdisciplinary minor known as the Foundations of Sustainability minor. The U of A is a member of The American College and University Presidents Climate Commitment (ACUPCC) and the Association for the Advancement of Sustainability in Higher Education Commitment and “among the first 100 signatories to the American College and University Presidents Climate Commitment” (University of Arkansas, 2010, p.1; AASHE, 2012d).

The U of A is the flagship university of the state system with a student population of nearly 23,000 students. Founded in 1871 as the first state university and only land-grant institution in the state, the U of A offers nearly 200 programs in undergraduate and graduate studies (University of Arkansas, 2012a). The U of A hosts many sustainability related endeavors. The office of Campus Sustainability along with the Sustainability Council collaborate to support the university’s mission for environmental stewardship. The sustainability council includes representatives from faculty, staff, and students along with members from the city and community. Work projects are guided by seven pillars including academics and research, energy, water resources, food, agriculture, and forestry, land use and development, pollution prevention and waste minimization, and social and community. In addition to ACUPCC and AASHE, partnerships exist with Second Nature, U.S. Green Building Council, and RecycleMania (University of Arkansas, 2012).

Program description.

All ACUPCC institutions are required to offer sustainability focused curricula to undergraduate students. By offering the Foundations of Sustainability minor, the University of

Arkansas introduced “students to fundamental knowledge forming the basis of the emerging discipline of sustainability. This foundational knowledge included an interdisciplinary approach to complex problem solving using appropriate analytical techniques” (University of Arkansas, 2010, p. 1). The University of Arkansas felt “it is time to enhance the educational experience of undergraduate students through focused study on Foundations of Sustainability” (University of Arkansas, 2010, p. 1).

The Foundations of Sustainability minor is interdisciplinary, which facilitates contributions, collaboration, and instruction from faculty members from multiple colleges within the institution. Undergraduate students from any academic major are eligible to minor in Foundations of Sustainability. This minor offers basic knowledge and skills in four thematic sustainability areas including social systems, natural systems, built systems, and managed systems (University of Arkansas, 2010). This minor is designed so that “students will acquire foundational understanding of sustainability as a legitimate area of knowledge that is strongly interdisciplinary. Philosophical principles of sustainability will be taught alongside interdisciplinary methods and techniques” (University of Arkansas, 2010, p. 2).

Selection of Subjects.

Subjects that were selected to participate in this study included students that had declared or had planned to declare a minor in Foundations of Sustainability as of January 2013. While students are not required to declare a minor in sustainability to take courses within the program, data was collected only from students who had declared the Foundations of Sustainability minor or had planned to declare the minor.

Instrumentation

Survey design.

A survey was developed based on previous research relative to student motivation and the selection of academic programs of study (Dierberger, 1998; Rogers, 2008; Fieselman, 2011). The survey instrument for this study was developed by adapting surveys used in previous dissertations and the surveys available as resources from AASHE. Permission was obtained from all authors of the dissertations, AASHE, and institutions involved in the surveys (See Appendices A, B, and C for letters of permission). Dierberger's (1998) survey included questions relevant to the motivational factors of career and monetary. Dierberger (1998) investigated influential factors and awareness of career possibilities for students selecting an Environmental Studies (ES) major. In addition to thirty-five students completing a survey, seven students were interviewed. The focus of the interview was to expand upon the reasons for the student's decision to select this major. The results of this study indicated that students selected the Environmental Studies major based on their own "interest in science and the environment. The decision to select ES is an informed choice as indicated by factors of influence and career awareness" (Dierberger, 1998, p. 80).

Roger's (2008) survey contained questions relevant to the motivational factor of career. Rogers (2008) identified motivational factors influencing undergraduate students to select a social work major. Students considering a social work major voluntarily completed a survey. Some students were invited to participate in an interview. The results of this study indicated that more females were drawn to the social work major to be able to serve others. Service to others was defined as "contributing to individuals, contributing to society, effecting social change, working with people, social work as interesting and exciting, belief in one's own success in

social work, and becoming a better person” (Rogers, 2008, p. 73). Job self interest was identified in the survey as “the importance of status and prestige, good salaries, working conditions, job opportunities, job security, and becoming a better person” (Rogers, 2008, p. 73). A majority of students indicated that good salaries were not an important motivational factor for selecting a major in social work. Rogers (2008) study also examined the demographics of gender as it related to selection of academic major and minor programs of study.

Offered as a resource from AASHE, Fieselman’s (2011) survey for Meredith College included questions relevant to the motivational factors of learning and social responsibility. Member institutions of the Association for the Advancement of Sustainability in Higher Education (AASHE, 2012c) share research and research tools with other members. Meredith College shared a survey designed to gather data concerning a student’s sustainability literacy. Specific statements were divided into categories that included understanding of environmental issues, factors influencing environmental practices, interest for learning more, environmentally responsible behaviors, defining sustainability, and sustainability at Meredith College (AASHE, 2012b).

The scale of measurement was ordinal for the majority of the survey since sixteen of the survey questions were likert-type, scaled, closed-ended with ordered response questions. Part one of the survey was designed for completion by all participants. Part one of the survey directed the participant to either continue the survey or discontinue the survey based on their declaration status of the Foundations of Sustainability minor. Students that continued with the survey classified themselves as either declared or planning to declare. The students who had not declared or did not plan to declare submitted the survey after completion of part one. Part one also addressed the dependent variable in this study, which is whether or not the student is

pursuing the Foundations of Sustainability minor. This initial survey question was closed-ended with an unordered response. In part two, the likert-type survey questions were grouped by motivational factors but were not identified as such (see Appendix E for the survey). The four motivational factors of career, learning, monetary, and social responsibility are the independent variables in this study. The belief of the participant concerning his or her own motivation made this survey more vulnerable to measurement error. To address this, special attention was given to the wording of questions. The beliefs or opinions of the participants “are very difficult to measure because they are often imprecise, change from day to day, and may not be well thought out in advance of the survey” (Salant & Dillman, 1994, p. 87).

Part three of the survey addressed demographics concerning the participant’s major academic program of study and gender in order to offer a profile of the sample being surveyed. Two demographic questions were closed-ended with unordered response. The scale of measurement for these was nominal. Table 1 below addresses the survey’s alignment with existing literature from research and the independent variables from the conceptual framework (see Appendix E for the survey).

Table 1

Survey Questions Alignment

Question number	Conceptual Framework	Research
2, 3, 5	Career	(Dierberger, 1998)
4	Career	(Rogers, 2008)
6-9	Learning	(Fieselman, 2011)
10-13	Monetary	(Dierberger, 1998)
14, 17	Social responsibility	(AASHE, 2012b)
15, 16	Social responsibility	(Fieselman, 2011)

Field Testing

Validity and reliability were addressed since the survey instrument was based on existing surveys and a field test was conducted. A survey instrument was developed based on previous research relative to student motivation and the selection of academic programs of study. The survey was developed by adapting surveys used in previous dissertations and the surveys available as resources from AASHE (Dierberger, 1998; Rogers, 2008; Fieselman, 2011). Additionally, the survey instrument was reviewed and approved by a group of experts. A list of the group of experts is available in Appendix F. Once this group agreed that the survey addressed the research questions for this study, the survey was field tested to address reliability. The survey was administered to a class of twenty students enrolled in the Governance and Policy Making in Higher Education graduate course on the U of A campus as a field test of the survey. Feedback from students about the survey did not identify any “ambiguities, misunderstanding, or other inadequacies” (Ary, Jacobs, & Sorensen, 2010, p. 402). Twelve participants offered feedback primarily addressing issues with spacing, capitalization, and wording. These issues were addressed prior to survey administration. Also to address reliability, the Cronbach alpha coefficient was .85. Pallant (2010) explains that a Cronbach alpha coefficient above .70 is ideal.

Human Subjects Considerations

In order to address any concerns or considerations for human subjects, application and approval was granted through the Institutional Review Board (IRB) of the University of Arkansas (see Appendix D). This process occurred after the survey was developed but prior to the survey administration. The IRB application stated that students would not enter any identifying data. The survey was voluntary and without penalty from their professors.

Data Collection Procedures

Survey administration.

Permission to distribute this survey to students during regularly scheduled classes was granted by the class instructors for the Applications of Sustainability class in November, 2012 and the Foundations of Sustainability class in January, 2013. The researcher contacted this team of instructors via email to request their participation and agreement to facilitate the researcher's distribution of the survey during class. Students on both rosters were identified during class to ensure receipt of the survey a second time would not occur. Prior to distribution of the survey, the researcher clearly stated verbally that the anonymity, confidentiality, and privacy of all participants were protected. This information was also written in the introduction of the survey itself. To address the issue of consent, the statement at the beginning of the survey declared that participation was voluntary, that students had the right to withdraw at any time, and by completing and submitting the survey the participant gave their consent for researchers to use their responses. The statement also clarified that only group data was reported. The researcher distributed the survey to undergraduate students during a regularly scheduled Applications of Sustainability class in November, 2012 and the Foundations of Sustainability class in January, 2013. Students completed the paper survey and deposited the completed survey in a box at the front of the room. The survey directions informed participants who had declared or plan to declare a minor in Foundations of Sustainability that their data would be included in the data analysis. Participants who did not plan to declare a minor in sustainability were instructed to complete only the initial question and submit the survey.

Data Analysis

Responses to part one of the survey by all participants were analyzed. Only data from the responses to question one were used from participants who indicated that they did not plan to declare a minor in Foundations of Sustainability since those participants did not continue with the remainder of the survey. Responses to parts one, two, and three of the survey by participants who had declared or planned to declare a minor in Foundations of Sustainability were included in further data analysis. Data collected from responses to part two of the survey addressed the independent variables career, learning, monetary, and social responsibility (see Table 1). Data collected from responses to part three addressed demographic information concerning gender and major program of study (see Appendix E for the survey). Data were analyzed using Statistical Package of Social Sciences (SPSS) software and Microsoft Excel. Data analysis explored possible significant differences for all survey items as well as demographics. Demographic data were used to explore possible correlations with student motivation concerning selection of an environmental sustainability related academic program. Past studies explored this possibility as well. Rogers (2008) explored differences of major selection based on gender. Brouse, et al, (2010) described demographics related to academic motivation. Data were analyzed using independent samples t-tests, Analysis of Variance (ANOVA), and nonparametric Kruskal-Wallis tests for the following research questions:

1. Do significant differences exist among the variables of career, monetary, learning, and social responsibility and a student's decision to pursue a minor in sustainability?

The researcher used Analysis of Variance (ANOVA) to identify any differences among motivational variables with respect to Likert-type scale results comparing average responses for

career, monetary, learning, and social responsibility. Parametric testing is best for normally distributed data. The parametric ANOVA testing has the ability to compare one dependent, continuous variable with three or more levels of an independent, categorical variable. Since the data did not appear to be normally distributed, the non-parametric alternative to ANOVA was also used which is the Kruskal-Wallis test (Pallant, 2010). If a significant difference existed, then Tukey's Honestly Significant Difference post-hoc test was used to determine which of the four variables showed a significant difference from the others. Additionally, data were analyzed using independent samples t-tests to determine that no significant difference existed between the participants that had declared a minor in Foundations of Sustainability and those that plan to declare a minor.

2. Is there a significant difference in student motivation for pursuing a minor in sustainability based on the students' gender?

The researcher used Analysis of Variance (ANOVA) to identify any differences among motivational variables based on the students' gender. If a difference existed, then Tukey's Honestly Significant Difference post-hoc test was used to determine which of the motivational variables showed a significant difference relative to gender. Additionally, data were analyzed using Kruskal-Wallis tests.

3. Do any significant differences exist between motivational factors based on a student's major?

The researcher used Analysis of Variance (ANOVA) to identify any differences among motivational variables based on the students' major. If a difference existed, then Tukey's Honestly Significant Difference post-hoc test was used to determine which of the motivational

variables showed a significant difference relative to the students' major. Additionally, data were analyzed using Kruskal-Wallis tests.

Summary

Students at the University of Arkansas enrolled in two introductory courses for the Foundations of Sustainability minor were administered a survey concerning student motivation for selection of this academic program of study. The survey was developed based on the review of literature of similar studies. Data analysis addressed the objectives of the study.

Chapter Four

Results

Student motivation is an important factor relative to choosing an academic major or minor. The purpose for this study was to examine the factors that motivated undergraduate students to pursue a minor in Foundations of Sustainability. To identify the motivations of these undergraduate students, a survey was administered. This chapter discusses the results of the survey and the data analysis methods that were used.

Many institutions of higher education offer environmental sustainability education. Major or minor programs of study are options at many institutions across the United States. The University of Arkansas began offering a minor in Foundations of Sustainability in the fall of 2011. The purpose of this study was to examine student motivation for pursuing this minor. Data were collected by administering a survey to undergraduate students in two required courses for the Foundations of Sustainability minor.

Data Analysis

The researcher collected data from 187 participants who attended two required courses in the Foundations of Sustainability minor. During the fall 2012 Applications of Sustainability course, 76 participants completed the survey. During the spring 2013 Foundations of Sustainability course, 111 students completed the survey. After removing five surveys submitted by students that did not meet the criteria for this study, 182 surveys were analyzed.

Participants indicated their choice concerning pursuit of the minor in Foundations of Sustainability in part 1 of the survey (See Appendix E for complete survey). Table 2 displays these results. Fifty-eight participants (31%) did not continue with the survey therefore data were not collected concerning motivation, gender, or major program of study for these participants.

Table 2*Frequency of Students Pursuing a Minor*

Semester	Fall 2012	Spring 2013
Total participants	59	65
Declared minor	45	34
Plan to declare	14	31
Do not plan to declare	15	43

Table 3 displays demographic information for gender indicating that 59 females (48%) and 63 males (52%) participated in the survey. Two of the respondents chose not to respond concerning gender. The data from those surveys were considered valuable and were included in analysis with the exception of analysis that involved gender.

Table 3*Frequency of Gender for Students Pursuing a Minor*

Semester	Fall 2012	Spring 2013
Females	31	28
Males	27	36
Unknown gender	1	1

Students pursuing the Foundations of Sustainability minor also declared a major program of study. All colleges within the university were represented, although higher percentages of students who completed the survey had declared a major in the School of Architecture (37%) and the College of Arts and Sciences (23%). Table 4 displays demographic information concerning the colleges associated with the participants' declared major program of study.

Table 4

Frequency of College Associated with Major Program

Semester	Fall 2012	Spring 2013	Total
Agriculture, Food and Life Sciences	8	13	21
Architecture	21	25	46
Arts and Sciences	18	11	29
Business	2	6	8
Education and Health Professions	1	0	1
Engineering	7	11	18
Unknown	1	0	1

Results related to Research Questions

Data were analyzed based on responses from students who participated in the survey administered as a part of this study. Data were analyzed relative to each research question.

Research Question One.

Do significant differences exist among the variables career, monetary, learning, and social responsibility and a student's decision to pursue a minor in sustainability?

For this study, students who had declared and those who planned to declare the Foundations of Sustainability minor were both considered to be pursuing the minor program of study. Based on independent samples t-tests for each motivational factor, data indicated that these students did not vary significantly in their motivation for pursuing this minor since the means and standard deviations for each were not significantly different. Based on these results for this study, all data were analyzed and identified as pursuing the Foundations of Sustainability minor. Table 5 displays results of the independent samples t-tests.

Table 5*Averages for Motivational Factors for Declared and Plan to Declare Participants*

Motivational factors	<i>n</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i> *
Career					
Total	124	3.8367	.69408	.577	.565
Declared	79	3.8639	.74442		
Plan to declare	45	3.7889	.60056		
Learning					
Total	124	4.2137	.66618	-.667	.506
Declared	79	4.1835	.69880		
Plan to declare	45	4.2667	.60865		
Monetary					
Total	124	3.8125	.78452	.252	.801
Declared	79	3.8259	.86172		
Plan to declare	45	3.7889	.63505		
Social Responsibility					
Total	124	4.0726	.56469	-1.07	.287
Declared	79	4.0316	.60628		
Plan to declare	45	4.1444	.48115		

Note. *n* = total participants. *M* = mean. *SD* = standard deviation. * α = 0.05 two-tailed.

The assumptions that are required prior to conducting Analysis of Variance testing including normality and homogeneity of variance were addressed. Based on tests of normality, the researcher determined that the means for all four motivational factors violated the assumption for normality. The Test of Homogeneity of Variances indicated that the means for all four motivational factors violated this assumption. Table 6 displays the results of the normality and variances testing.

Table 6*Results of Tests of Normality and Variances*

Motivational factors	Shapiro-Wilk		Equality of Variances	
	<i>W</i>	<i>p</i> *	<i>F</i>	<i>p</i> *
Career	.954	.000	4.016	.008
Learning	.896	.000		
Monetary	.945	.000		
Social Responsibility	.954	.000		

Note. * $\alpha = 0.05$.

Based upon the results shown in Table 6, none of the data for motivational factors appeared to be normally distributed. However, Pallant (2010) states that many times data are not normally distributed. “This does not necessarily indicate a problem with the scale, but rather reflects the underlying nature of the construct being measured” (Pallant, 2010, p. 64). To address the issue of the possible lack of normal distribution, the data were analyzed with non-parametric Kruskal-Wallis test in addition to the one-way analysis of variance (ANOVA) using Statistical Package of Social Sciences (SPSS) software. The Kruskal-Wallis test, which does not require that assumptions be met for normality and homogeneity of variance, is the non-parametric alternative to the analysis of variance (ANOVA) test (Pallant, 2010). Survey responses to the questions related to each motivational factor were averaged and used in the analysis of variance. Results of the analysis indicated that the motivational factor of career showed a mean of 3.8367. Results of the analysis indicated that the motivational factor of learning showed a mean of 4.2137. Results of the analysis indicated that the motivational factor of monetary showed a mean of 3.8125. Results of the analysis indicated that the motivational factor of social responsibility showed a mean of 4.0726. Table 7 displays the means from the analysis of variance testing among the motivational variables.

Table 7*Means of Motivational Factors*

Variables	<i>n</i>	<i>M</i>	<i>SD</i>
Career	124	3.8367	.69408
Learning	124	4.2137	.66618
Monetary	124	3.8125	.78452
Social Responsibility	124	4.0726	.56469

Note. *n* = total participants. *M* =mean. *SD* = standard deviation.

A significant difference existed among motivational factors for pursuing a minor in Foundations of Sustainability based on the results of Analysis of Variance (ANOVA) testing [$F(3,492) = 9.93, p = 0.0000023$]. Table 8 displays the results of the existence of significant differences among motivational factors.

Table 8*Evidence of Significant Differences Among Motivational Factors*

Variables	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i> *
Career	3.8367	.69408	9.932	.0000023
Learning	4.2137	.66618		
Monetary	3.8125	.78452		
Social Responsibility	4.0726	.56469		

Note. *M* = mean. *SD* = Standard Deviation. * $\alpha = 0.05$.

The Kruskal-Wallis test results supported the results of the ANOVA that a significant difference exists among motivational factors for participants pursuing a minor in sustainability. See Table 21 for the Kruskal-Wallis results.

Differences existed between mean scores of responses to the survey questions. The effect size among the motivational factors, determined by calculating eta squared, was .06, which was a medium effect size (Pallant, 2010). Tukey's Honestly Significant Difference (HSD) post-hoc

test indicated that a significant difference existed among the motivational factors of career and learning, career and social responsibility, monetary and learning, and monetary and social responsibility. The mean score for career ($M = 3.8367$, $SD = 0.69408$) was significantly different from learning ($M = 4.2137$, $SD = .66618$). The mean score for career ($M = 3.8367$, $SD = 0.69408$) was significantly different from social responsibility ($M = 4.0726$, $SD = .56469$). The mean score for monetary ($M = 3.8125$, $SD = .78452$) was significantly different from learning ($M = 4.2137$, $SD = .66618$). The mean score for monetary ($M = 3.8125$, $SD = .78452$) was significantly different from social responsibility ($M = 4.0726$, $SD = .56469$). No significant differences exist between career and monetary and learning and social responsibility. Table 9 displays the results of Tukey's HSD test.

Table 9

Results of Tukey's HSD Test

Variables	<i>MD</i>	<i>p</i> *
Career and learning	.377	.000
Career and social responsibility	.236	.034
Monetary and learning	.401	.000
Monetary and social responsibility	.260	.015
Career and monetary	.024	.992
Learning and social responsibility	.141	.363

Note. *MD* = absolute value of mean differences. * $\alpha = 0.05$.

Research Question Two.

Is there a significant difference in student motivation for pursuing a minor in sustainability based on the students' gender?

Two of the 124 participants chose not to respond concerning gender. Data from those two respondents could not be included in the analysis for significant differences in motivation

based on gender. Hence, means relative to data for gender only included 122 participants, which varied slightly from the data analyzed from 124 participants utilized to address research question one.

A significant difference existed for females among motivational factors for pursuing a minor in Foundations of Sustainability based on the results of Analysis of Variance (ANOVA) testing [$F(3, 220) = 6.18, p = 0.000$]. Table 10 displays the evidence of significant differences for females.

Table 10

Evidence of Significant Differences Among Motivational Factors for Females

Variables	<i>n</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i> *
Career	56	3.0286	.68873	6.182	.000
Learning	56	4.2589	.72294		
Monetary	56	3.7321	.79180		
Social Responsibility	56	4.1295	.55594		

Note. *n* = total participants. *M* = mean. *SD* = standard deviation. * $\alpha = 0.05$.

The non-parametric Kruskal-Wallis test results agreed with the ANOVA results concluding that a significant difference does exist among motivational factors for female participants pursuing a minor in sustainability. See Table 21 for the Kruskal-Wallis results.

Using Tukey's HSD post-hoc test, female participants indicated a significant difference between the motivational factors of monetary and learning and monetary and social responsibility. The mean score for monetary ($M = 3.7321, SD = .79180$) was significantly different from learning ($M = 4.2589, SD = .72294$). The mean score for monetary ($M = 3.7321, SD = .79180$) was significantly different from social responsibility ($M = 4.1295, SD = .55594$).

Table 11 displays the results of Tukey's HSD test.

Table 11*Results of Tukey's HSD test for Females*

Variables	<i>MD</i>	<i>p</i> *
Monetary and learning	.527	.000
Monetary and social responsibility	.397	.015
Career and monetary	.196	.442
Learning and social responsibility	.129	.758
Career and learning	.330	.060
Career and social responsibility	.201	.422

Note. *MD* = absolute value of mean differences. * $\alpha = 0.05$.

A significant difference for males existed among motivational factors for pursuing a minor in Foundations of Sustainability based on the results of Analysis of Variance (ANOVA) testing, [$F(3, 252) = 4.827, p = 0.003$]. Table 12 displays evidence of significant differences for males.

Table 12*Evidence of Significant Differences Among Motivational Factors for Males*

Variables	<i>n</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i> *
Career	64	3.7695	.71312	4.827	.003
Learning	64	4.1836	.61114		
Monetary	64	3.8555	.78022		
Social Responsibility	64	4.0273	.55477		

Note. *n* = total participants. *M* = mean. *SD* = standard deviation. $\alpha = 0.05$.

The non-parametric Kruskal-Wallis test results agreed with the ANOVA results concluding that a significant difference does exist among motivational factors for male participants pursuing a minor in sustainability. See Table 21 for the Kruskal-Wallis results.

Tukey's HSD post-hoc test indicated a significant difference between the motivational factors of career and learning and learning and monetary and male participants. The mean score

for career ($M=3.7695$, $SD = .71312$.) was significantly different from learning ($M = 4.1836$, $SD = .61114$). The mean score for learning ($M = 4.1836$, $SD = .61114$) was significantly different from monetary ($M=3.8555$, $SD = 78022$). Table 13 displays the results for Tukey’s HSD for males.

Table 13

Results of Tukey’s HSD test for Males

Variables	<i>MD</i>	<i>p</i> *
Career and learning	.414	.003
Monetary and learning	.328	.031
Monetary and social responsibility	.172	.469
Career and monetary	.086	.887
Learning and social responsibility	.156	.552
Career and social responsibility	.258	.133

Note. *MD* = absolute value of mean differences. * $\alpha = 0.05$.

Both females and males indicated that learning was more of a motivational factor than monetary. Also, females indicated that social responsibility was more of a motivational factor than monetary. Additionally, male participants indicated learning as a higher motivational factor than career. Based on the mean rank, learning and social responsibility motivated both females and males more than career and monetary when making the decision to pursue a minor in environmental sustainability.

Research Question Three.

Is there a significant difference in student motivation for pursuing a minor in sustainability based on the students’ major?

Using one-way ANOVA, data were analyzed to determine if a significant difference existed among the motivational factors for students pursuing a minor in sustainability based upon

the colleges that are associated with the student’s major program of study. In other words, did any significant differences exist among motivational factors based on a student’s major?

Due to small cell sizes in four data sets, the researcher made the following modifications. One major program of study associated with the College of Education and Health Professionals only had one participant. One participant indicated unknown as their college associated with their major program of study. The data from these two choices were not included in the analysis. Only eight participants indicated that their major program of study was associated with the College of Business. Eighteen indicated their major program of study was associated with the College of Engineering. These two colleges were combined into one group to establish cell sizes that were somewhat consistent with the other cell sizes. Table 14 displays these modifications.

Table 14

Frequency for Modifications due to Small Cell Sizes in Data for Colleges Associated with Major

College	Total
Agriculture, Food and Life Sciences	21
Architecture	46
Arts and Sciences	29
Combined Total	26
Business	8
Engineering	18
Omitted Total	2
Education and Health Professions	1
Unknown	1

A one-way ANOVA was used to analyze each of the four categories of colleges. Results of the analysis indicated that significant differences existed among the motivational factors for students who majored in programs within the College of Agriculture, Food, and Life Sciences. A significant difference was indicated among motivational factors based on the results of

Analysis of Variance (ANOVA) testing, [F (3,80) = 9.51, p = 0.000]. See Table 15 for the results for the College of Agriculture, Food, and Life Sciences.

Table 15

Evidence of Significant Differences Among Motivational Factors for Majors in the College of Agriculture, Food, and Life Sciences

Variables	<i>n</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i> *
Career	21	3.9524	.57889	9.508	.000
Learning	21	4.5833	.45644		
Monetary	21	3.7857	.59836		
Social Responsibility	21	4.1071	.37559		

Note. *n* = total participants. *M* = mean. *SD* = standard deviation. *M* = mean. * α = 0.05.

The non-parametric Kruskal-Wallis results confirmed the results of the ANOVA that significant differences existed among motivational factors for participants who have declared a major associated with the College of Agriculture, Food and Life Sciences. See Table 21 for the Kruskal-Wallis results.

Tukey's HSD post-hoc test indicated a significant difference between the motivational factors of career and learning, monetary and learning, and social responsibility and learning. The mean score for career ($M = 3.9524$, $SD = .57889$) was significantly different from learning ($M = 4.5833$, $SD = .45644$). The mean score for monetary ($M = 3.7857$, $SD = .37559$) was significantly different from learning ($M = 4.5833$, $SD = .45644$). The mean score for social responsibility ($M = 4.1071$, $SD = .37559$) was significantly different from learning ($M = 4.5833$, $SD = .45644$). Table 16 displays the results for the College of Agriculture, Food and Life Sciences.

Table 16

Results of Tukey's HSD Test of Motivational Factors for Majors in the College of Agriculture, Food, and Life Sciences

Variables	<i>MD</i>	<i>p</i> *
Career and learning	.631	.001
Monetary and learning	.800	.000
Social responsibility and learning	.476	.017
Career and social responsibility	.155	.760
Monetary and social responsibility	.321	.182
Career and monetary	.167	.716

Note. *MD* = absolute value of mean differences. * α = 0.05.

For the students who were majoring in programs within the School of Architecture, no significant differences existed among the motivational factors. No significant difference was indicated among motivational factors based on the results of Analysis of Variance (ANOVA) testing, [$F(3,180) = .586, p = 0.625$]. Table 17 displays results for the School of Architecture.

Table 17

Evidence of Significant Differences Among Motivational Factors for Majors in the School of Architecture

Variables	<i>n</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i> *
Career	46	3.9076	.64841	.586	.625
Learning	46	4.0380	.70900		
Monetary	46	3.8641	.77047		
Social Responsibility	46	3.9728	.54830		

Note. *n* = total participants. *M* = mean. *SD* = standard deviation. *M* = mean. * α = 0.05.

The non-parametric Kruskal-Wallis results agreed with the ANOVA results concluding no significant differences existed among motivational factors for participants who have declared a major within the School of Architecture. See Table 21 for the Kruskal-Wallis results.

For the students majoring in programs within the College of Arts and Sciences, a significant difference existed among the motivational factors. A significant difference existed among motivational factors based on the results of Analysis of Variance (ANOVA) testing, [$F(3,112) = 5.836, p = 0.001$]. Table 18 displays results for the College of Arts and Sciences.

Table 18

Evidence of Significant Differences Among Motivational Factors for Majors in the College of Arts and Sciences

Variables	<i>n</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i> *
Career	29	3.7672	.85286	5.836	.001
Learning	29	4.3707	.61463		
Monetary	29	3.6638	.94083		
Social Responsibility	29	4.2500	.66144		

Note. *n* = total participants. *M* = mean. *SD* = standard deviation. *M* = mean. * $\alpha = 0.05$.

The non-parametric Kruskal-Wallis confirmed the results of the ANOVA that significant differences existed among motivational factors for participants who have declared a major associated with the College of Arts and Sciences. See Table 21 for the Kruskal-Wallis results.

Tukey's HSD post-hoc test indicated a significant difference existed between the motivational factors of career and learning, monetary and learning, and social responsibility and monetary. The mean score for career ($M = 3.7672, SD = .85286$) was significantly different from learning ($M = 4.3707, SD = .61483$). The mean score for monetary ($M = 3.6638, SD = .94083$) was significantly different from learning ($M = 4.3707, SD = .61483$). The mean score for social responsibility ($M = 4.2500, SD = .66144$) was significantly different from monetary ($M = 3.6638, SD = .94083$). Table 19 displays Tukey's HSD results for the College of Arts and Sciences.

Table 19

Results of Tukey's HSD Test of Motivational Factors for Majors in the College of Arts and Sciences

Variables	<i>MD</i>	<i>p</i> *
Career and learning	.603	.020
Monetary and learning	.707	.004
Monetary and social responsibility	.586	.025
Career and social responsibility	.483	.091
Career and monetary	.103	.958
Social responsibility and learning	.121	.935

Note. *MD* = absolute value of mean differences. * α = 0.05.

For the students majoring in programs within the Colleges of Business and Engineering, no significant differences existed among the motivational factors based on the results of Analysis of Variance (ANOVA) testing, [F (3,100) = 1.072, p = .365]. Table 20 displays the results for the Colleges of Business and Engineering.

Table 20

Evidence of Significant Differences Among Motivational Factors for Majors in the Colleges of Business and Engineering

Variables	<i>n</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i> *
Career	26	3.7019	.69289	1.072	.365
Learning	26	4.0096	.64607		
Monetary	26	3.8846	.77856		
Social Responsibility	26	3.9712	.56270		

Note. *n* = total participants. *M* = mean. *SD* = standard deviation. *M* = mean. * α = 0.05.

The Kruskal-Wallis test confirmed the results of the ANOVA that no significant differences exist among motivational factors for participants who have declared a major associated with the Colleges of Business and Engineering. See Table 21 for the Kruskal-Wallis results.

Table 21*Results of Kruskal-Wallis Tests*

Research question	χ^2	p^*	Highest MR
Research question one	30.775	.000	Learning (299.51)
Research question two			
Female	21.334	.000	Learning (138.54)
Male	13.291	.004	Learning (153.38)
Research question three			
Agriculture, Food and Life Sciences	20.514	.000	Learning (61.52)
Architecture	2.600	.458	Learning (102.21)
Arts and Sciences	14.514	.002	Learning (72.74)
Business and Engineering	3.912	.271	Learning (59.04)

Note. $*\alpha = 0.05$. MR = mean rank.

Summary

This study examined the factors that motivate undergraduate students to pursue the Foundations of Sustainability minor. Data were collected and analyzed based on the responses from students who participated in the survey administered as a part of this study. The results of the data analysis indicated that significant differences existed for student motivation for those pursuing the Foundations of Sustainability minor between career and learning, career and social responsibility, monetary and learning, and monetary and social responsibility. Both males and females indicated a similar significant difference concerning the motivational factors. Based on the college associated with a student's major program of study, participants indicated a significant difference existed for motivation in the College of Agriculture, Food, and Life Sciences and the College of Arts and Sciences. A significant difference in motivational factors

did not exist for students in the School of Architecture, the College of Business, or the College of Engineering.

Chapter Five

Conclusions, Recommendations, and Discussion

In *Our Common Future*, Brundtland (1987) proposed that organizations including educational institutions would play a crucial role in an environmentally sustainable future for our world. Twenty-five years later, educational institutions are experiencing a wide range of interest in environmental sustainability among students, educators, and private sector partners.

Educators are tasked with developing curricula that integrate environmental sustainability ranging from thematic units to minor and major programs of study (AASHE, 2012e). Potential employers seek and require candidates with sustainability knowledge as a component to needed skills (Cameron, 2012). Undergraduate students have a multitude of courses and minor and major programs of study to choose from in their undergraduate experience in higher education, but little is known why students choose these programs. The purpose of this study was to examine the factors influencing student motivation for pursuing an academic program of study in environmental sustainability specifically a minor in Foundations of Sustainability. This chapter summarizes the study, examines conclusions, and explores recommendations for practice and future research.

Summary of the Study

A conversation with Dr. S. Boss, the co-chair of the Foundations of Sustainability minor at the University of Arkansas provided the catalyst for this study. According to Dr. Boss, students who have declared the minor in Foundations of Sustainability, represent a variety of majors within programs across the University of Arkansas campus (Dr. S. Boss, personal communication, December, 2011). This conversation fueled the researcher's curiosity to identify which factors motivated students to pursue a minor in Foundations of Sustainability. A review

of literature identified four motivational factors that were frequently present in research concerning the selection of academic programs by undergraduate students (Dierberger, 1998; Rogers, 2008; Fieselman, 2011). The conceptual framework for this study was based upon previous research and also served as the foundation for the survey design. A survey was designed based on surveys used in similar research studies and by another higher education institution. Previous research existed concerning student motivation for selection of other academic major or minor programs of study. Dierberger's (1998) dissertation explored student motivation for selection of an environmental studies major. Rogers's (2008) dissertation explored student motivation for selection of a social work major. The Association for the Advancement of Sustainability in Higher Education (AASHE, 2012c) offers a variety of surveys shared by member institutions. One of these surveys developed by Fieselman (2011) for Meredith College examined learning in a sustainability literacy assessment survey. Survey questions for this study were grouped based on four motivational factors: career, monetary, learning, and social responsibility. Survey participants in this quantitative study were voluntary and anonymous. The results of the data from the surveys were analyzed with independent samples t-tests, analysis of variance (ANOVA), and Kruskal-Wallis tests using Statistical Package of Social Sciences (SPSS) software.

Conclusions

This study concluded with the examination of the results based upon the research questions. The following conclusions were made:

1. Concerning a student's decision to pursue a minor in sustainability, significant differences existed between the independent motivational variables of career and social responsibility, career and learning, learning and monetary, and social responsibility and

monetary. No significant difference existed between the motivational factors of learning and social responsibility and career and monetary. Participants in this study indicated that their primary motivation for pursuing a minor in sustainability was based on a desire to learn. The culture of thinking on this campus for this sample of students may account for the lack of a significant difference between learning and social responsibility. Career and monetary are factors that are interrelated in many instances.

2. Considering a student's gender, significant differences existed in student motivation. Both females and males indicated a significant difference existed between monetary and learning. Also, a significant difference existed for a female's motivation between monetary and social responsibility. Additionally, a significant difference existed for male participants between career and learning. Based on the mean rank, learning and social responsibility motivated both females and males more than career and monetary when making the decision to pursue a minor in environmental sustainability. Motivation differences for these factors may be attributable to gender differences (Rogers, 2008).

3. Based on a student's major program of study, significant differences existed for motivation for pursuing a minor in Foundations of Sustainability for those students whose majors are associated with the College of Agriculture, Food, and Life Sciences and the College of Arts and Sciences. A significant difference did not exist for students associated with the School of Architecture, the College of Business, or the College of Engineering. Motivational differences based on the colleges involved with a student's major program of study link to an important commonality which is that students from all colleges are motivated, albeit for different reasons, to participate in the Foundations of Sustainability minor. The lack of significant differences

between career, learning, monetary, and social responsibility may be attributed to the small sample sizes in each college.

Recommendations

For practice.

Fifty-eight participants (31%) in this study enrolled in course work even though they had no intention to pursue a minor in sustainability. Recruitment for a declaration of a minor in Foundations of Sustainability should be encouraged in all colleges but a specific focus should be on colleges with low participation. The College of Education and Health Professionals only had one participant pursuing this minor. As the potential for environmental education in the K-12 setting increases, future teachers need to possess skills in environmental sustainability. Health care professionals need to understand environmental sustainability's role as a framework for healthy foods and environmentally safe homes and workplaces. Only eight participants represented the College of Business. The private sector seeks new employees who can lead others in corporate environmental sustainability. Business majors become more competitive with a background in environmental sustainability (Babiak & Trendfilova, 2011). Degree requirements in some major programs of study do not require a minor program of study. Some major programs of study require many courses leaving little room for electives. Faculty advisors along with students may not be aware of the Foundations of Sustainability minor since it has only been available for one year. However, efforts to ensure awareness could increase participation. Some students may enroll in the courses as electives because the course is compatible with their scheduling needs and interests.

The Association for the Advancement of Sustainability in Higher Education continues to document increases in the number of higher education institutions offering minor and major

programs of study in Environmental Sustainability (AASHE, 2012d). Many universities begin the pursuit of environmental sustainability with a minor program of study and then expand to a major program of study. Offering a major program of study would allow students to explore more extensive course work on the topic of sustainability and be better prepared for the multitude of possibilities in the workforce as sustainability professionals.

For research.

Future research with participants in the Foundations of Sustainability minor at the University of Arkansas should expand and continue. A student's family background could impact their motivation for pursuit of certain major or minor programs of study. Knowing the student's county of residence would be helpful in determining whether the student grew up in a rural or urban setting. (Dr. Z. Moon, personal communication, December 3, 2012). Knowing whether the student grew up in a rural or urban setting could relate to previous research that students selected a major in environmental studies based on interest that developed "at a young age" (Dierberger, 1998, p. 75). Current and past experiences such as practicing recycling, reusing, and reducing or membership in organizations that support environmental sustainability could link to a student's motivation to pursue an academic program in environmental sustainability.

Students who declare this minor are also required to complete a capstone project involving service, internship, and/or research (University of Arkansas, 2012b). A capstone topic could involve exploration of research concerning current and past experiences by interviewing current students minoring in Foundations of Sustainability. Another capstone topic could survey current practices of young students in conjunction with an environmentally sustainable education project with students in K-12 rural and urban settings.

Research involving students that did not select this as a minor program of study could be beneficial information for recruitment. Students were not surveyed outside of the two sustainability courses. A campus-wide survey of all students could reveal other factors such as student motivation to pursue other minors, lack of awareness of this minor, or inability to pursue a minor program of study.

Expansion of this quantitative study into a mixed methods study could integrate student interviews. Although the four motivational factors investigated in this study were based on existing research, other factors may exist that motivate students to participate in these academic programs. Qualitative data collection methods, such as interviews, would focus precisely on motivational factors of individual students and may reveal other motivational factors.

To state that the results of this study are generalizable and transferrable to other universities or programs of study would be presumptuous and preliminary. All data collected and analyzed may or may not be generalizable. Expansion of this research to other higher education institutions could deliver generalizable results. Interest exists in other higher education institutions offering minor programs of study in sustainability to examine motivational factors of their students. Research in similar institutions within the geographic region and outside of the southeastern geographic region would expand this body of knowledge. Research in private or parochial higher education institutions could reveal similar or dissimilar results. Since the University of Arkansas student body is primarily comprised of traditional students, age was not included in demographic data for this study. Research with other universities could render different results if more non-traditional students are surveyed. The addition of demographics for age and race could also be advantageous and contribute to the generalizability of similar studies. The addition of generational categories could yield interesting results

concerning motivation and behaviors. Analysis of race along with other demographics might reveal trends that could be utilized in practice.

Future research could be enhanced with pre-evaluation, formative and summative evaluation of motivational factors. Data collection at the beginning, during, and at the end of the program of study could also reveal different results. A student's motivation for continuing to pursue a minor or major in sustainability could change as the student progresses through the program. Most students who participated in this study want to learn and be socially responsible. Some educators may feel relieved that these students are pursuing this minor for what they view as the right reasons. Some educators and private sector partners may feel that students should be more assertive concerning their careers and preparation to become more marketable and competitive in the workforce. Since the majority of these student participants in this study are freshmen or sophomores, it is possible that their motivation for pursuing this minor may change before graduation. They may become more focused on the minor in Foundations of Sustainability increasing their hiring potential.

Expanding the research to post-graduate participants could reveal information concerning real world application of the environmental sustainability programs of study. Investigating a graduate's reflections upon the effectiveness of the content could assist in program evaluation. Application of the learning to the graduate's everyday life either personally or professionally could be important for program evaluation as well.

Discussion

With any level of learning, educational institutions always hope to facilitate a student's ability to achieve higher levels of thinking (Dyrud & Worley, 1998). Students need to leave an institution prepared to analyze and debate controversial issues such as many of the topics related

to environmental sustainability. Producing students who could be identified as thinkers or change agents may impact the future and continue to facilitate an increase in global awareness. Student motivation is key to commitment and participation in the academic program as well as environmental sustainability issues. Knowledge of which factors motivate students to pursue a minor in Foundations in Sustainability could guide future program and course offerings. Knowledge concerning student motivation could assist in justification for the minor in Foundations of Sustainability program and support its continuation.

Finally, this study is important because it contributes to continued and increased awareness of the environmental sustainability issue. Educational institutions are welcoming environmental sustainability programs to their campus. The number of educational institutions participating both nationally and internationally has increased (AASHE, 2012c). Facilitating environmental sustainability on higher education campuses moves students, educators, and private sector partners closer to the goal of meeting current needs of society without incapacitating the ability of future generations to meet their own needs.

References

- American College & University Presidents' Climate Commitment. (2012). *Mission and history*. Retrieved from <http://www.presidentsclimatecommitment.org/about/mission-history>
- Arbo, P. & Benneworth, P. (2007). *Understanding the regional contribution of higher education institutions: A literature review*. OCED Education Working Papers, No. 9. OECD Publishing.
- Arcidiacono, P., Hotz, V., & Kang, S. (2012). Modeling college major choices using elicited measures of expectations and counterfactuals. *Journal of Econometrics*, 166 (1), 3-16. Doi:10.1016/j.jeconom.2011.06.002
- Ary, D., Jacobs, L. C., & Sorensen, C. (2010). *Introduction to research in education*. (8th ed.). Florence, KY: Wadsworth Cengage Learning.
- Association for the Advancement of Sustainability in Higher Education (AASHE). (2012a) AASHE Mission, Vision and Goals. [Data file]. Retrieved from <http://www.aashe.org/about/aashe-mission-vision-goals>
- Association for the Advancement of Sustainability in Higher Education (AASHE). (2012b) Meredith College 2011 Sustainability Literacy Assessment Survey. [Data file]. Retrieved from http://www.aashe.org/files/2011_sustainability_literacy_survey_final.pdf
- Association for the Advancement of Sustainability in Higher Education (AASHE). (2012c) Meredith College 2011 Sustainability Literacy Assessment Survey. [Data file]. Retrieved from <http://www.aashe.org/resources/resources-sustainability-research/>
- Association for the Advancement of Sustainability in Higher Education (AASHE). (2012d) Sustainability-Focused Academic Degree Programs. [Data file]. Retrieved from <http://www.aashe.org/resources/academic-programs/search>
- Association for the Advancement of Sustainability in Higher Education (AASHE). (2012e) Sustainability-Focused Academic Degree Programs. [Data file]. Retrieved from <http://www.aashe.org/resources/conference/trends-interdisciplinary-environmental-and-sustainability-education>
- Babiak, K. & Trendafilova, S. (2011). CSR and environmental responsibility: Motives and pressures to adopt green management practices. *Corporate Social Responsibility Management*, 18(1), 11-24.
- Bezbatchenko, A. W. (2011). *Where meaning lies: Student attitudes and behaviors related to sustainability in college*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (UMI No. 870038301)

- Brundtland, G. H. (1987). Towards sustainable development. *Report of the World Commission on Environment and Development: Our Common Future*. Retrieved from <http://www.un-documents.net/ocf-02.htm>
- Brouse, C. H., Basch, C. E., LeBlanc, M., McKnight, K. R., & Lei, T. (2010). College students' academic motivation: Differences by gender, class, and source of payment. *College Quarterly*, 13(1). Retrieved from <http://0-www.eric.ed.gov.library.uark.edu/PDFS/EJ912093.pdf>
- Cameron, A. (2012). A sustainable workplace – we're all in it together. *Strategic Direction*, 28(1), 3-5. Doi: 10.1108/02580541211188987
- Carnegie Foundation for the Advancement of Teaching, (2012). *Institution Lookup*. Retrieved from http://classifications.carnegiefoundation.org/lookup_listings/institution.php
- Carson, R. L. (1962). *Silent spring*. New York: Houghton Mifflin.
- Chang, C. E., Nelson, W. A., & Witte, H. D. (2012). Do green mutual funds perform well? *Management Research Review*, 35 (8), 693-708. Retrieved from <http://0-search.proquest.com.library.uark.edu/docview/1022752155/fulltextPDF?accountid=8361>
- Christensen, L. J., Peirce, E., Hartman, L. P., Hoffman, W. M., & Carrier, J. (2007). Ethics, CSR, and sustainability education in the *Financial Times* top 50 global business schools: Baseline data and future research directions. *Journal of Business Ethics*, 73(4), 347-368. Retrieved from <http://www.jstor.org/stable/25075429>
- Conservation (2012). *Encyclopaedia Britannica*. Retrieved from <http://www.britannica.com/EBchecked/topic/133385/conservation>
- Cortese, A. D. (2003). The critical role of higher education in creating a sustainable future. *Planning for higher education*, 31(3), 15-22.
- Cox, C. K. (2005). *Organic leadership: The co-creation of good business, global prosperity, and a greener future*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (AAT 3180735)
- Cummings, G. A. (2010). *Turning higher education green from the inside out: Four case studies of four colleges and universities who 'made green happen'*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (UMI No. 3421847)
- Deci, E. L. (1975). *Intrinsic motivation*. New York: Plenum Press.
- Dierberger, B. S. (1998). *Determination of informed choice and pathways leading to selection of the Environmental Studies major*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (UMI No. AAT 9912685)

- Domene, J. F., Socholotiuk, K. D., & Woitowicz, L. A. (2011). Academic motivation in post-secondary students: Effects of career outcome expectations and type of aspiration. *Canadian Journal of Education*, 34(1), 99-127. Retrieved from <http://ojs.vre.uepi.ca/index.php/cje-rce/article/view/351/844>
- Dos Santos, M. A.O., Svensson, G., & Padin, C. (2013). Indicators of sustainable business practices: Woolworths in South Africa. *Supply Chain Management: An International Journal*, 18 (1), 104-108. Retrieved from EBSCO <http://0-www.emeraldinsight.com.library.uark.edu/journals.htm?articleid=17076651&show=abstract>
- Dyrud, M.A., & Worley, R.B. (1998). Focus on teaching: Critical thinking. *Business Communication Quarterly*, 61(3) 62-63.
- Ecology. (2012). *Encyclopaedia Britannica*. Retrieved from <http://www.britannica.com/EBchecked/topic/178273/ecology>
- Environmental Management Assistance Program, (2013). Going green: What does it mean? *Green your business*. Retrieved from <http://www.askemap.org/greenyourbusiness>
- Fields, S. (2002). Sustainable business makes dollars & sense. *Environmental Health Perspectives*, 110(3), A142-A145.
- Fieselman, L. (2011) *Sustainability literacy assessment survey*. Unpublished survey, Office of Research Planning and Assessment, Meredith College, Raleigh, NC. Retrieved from <http://www.aashe.org/resources/surveys-sustainability-awareness-attitudes-and-values>
- Finlay, J., & Massey, J. (2012). Eco-campus: Applying the ecocity model to develop green university and college campuses. *International Journal of Sustainability in Higher Education*, 13(2), 150-165.
- Friedman, T. L. (2008). *Hot, flat, and crowded*. New York: Farrar Straus & Giroux.
- Goodland, R. (1995). Concept of Environmental Sustainability. *Annual Review of Ecology and Systematics*, 26, 1-24.
- Gore, A. (2009). *Our choice: A plan to solve the climate crisis*. Emmaus, PA: Rodale Press, Incorporated.
- Hawkins, R. S. (2005). *Student attitudes, motivation, and actions: Effects of a public affairs capstone course*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (UMI No. 305026563)

- Hersey, C. E. (1995). *The motivation for professional advancement*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (UMI No. 304229426)
- Hilmer, M. J., & Hilmer, C. E. (2012). On the relationship between student tastes and motivations, higher education decisions, and annual earnings. *Economics of Education Review*, 31(1), 66-75.
- Koch, J. V. (1972). Student choice of undergraduate major field of study and private internal rates of return. *Industrial & Labor Relations Review*, 26(1), 680-685.
- Lear, L. (2002). Introduction. In R. Carson, *Silent spring*. New York: Houghton Mifflin.
- Lokko, C. (2011). *Wrestling for our humanity: An examination of college degree choice processes used by freshmen and sophomores at West Virginia University*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (AAT 3476491)
- Maas, M. K. (2007). *Establishing corporate social responsibility (CSR): An added competency for organization development (OD) practitioners*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (UMI No. 3284846)
- Martens P. (2006) Sustainability: science or fiction? *Sustainability: Science, Practice, & Policy* 2(1), 36-41. Retrieved from <http://sspp.proquest.com/archives/vol2iss1/communityessay.martens.html>
- Miller, M. A., & McCartan, A. (1990) Making the case for new interdisciplinary programs. *Change*, 22(3). 28-35. Retrieved from Ebsco.
- Montmarquette, C., Cannings, K., & Mahseredjian, S. (2002). How do young people choose college majors? *Economics of Education Review*, 21(6), 543.
- National Wildlife Federation. (2012). Our mission. Retrieved from <http://www.nwf.org/About/Our-Mission.aspx>
- National Wildlife Federation. (2008). Campus environment 2008: A national report card on sustainability in higher education. Retrieved from <http://www.nwf.org/Global-Warming/Campus-Solutions/Resources/Reports/Campus-Report-Card.aspx>
- Newell, W. H. (2011). The road from interdisciplinary studies to complexity. *World Futures: The Journal of General Evolution*, 67(4/5), 330-342. Doi:10.1080/02604027.2011.585907
- Pallant, J. (2010). *SPSS survivor manual: A step by step guide to data analysis using SPSS* (4th ed.). Open University Press: Berkshire, England.
- Pearson, L., & Carey, L. M. (1995). The academic motivation profile for undergraduate student

- use in evaluating college courses. *Journal of Educational Research*, 88(4), 220-27.
- Preston, L. (2001). Sustainability at Hewlett-Packard: From theory to practice. *California Management Review*, 43(3), 26-37.
- Rogers, L. (2008). *Selection of social work as an academic major among male and female undergraduate baccalaureate students*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (UMI No. 3346470)
- Roksa, J. (2012). Double disadvantage or blessing in disguise? Understanding the relationship between college major and employment sector. *Sociology of Education*, 78(3), 207-232.
- Ryan, R. M., & Deci, E. L. (2000a). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, 25(1), 54-67. Doi: 10.1006/ceps.1999.1020
- Ryan, R. M., & Deci, E. L. (2000b). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68. Retrieved from Ebscohost
- Salant, P., & Dillman, D. A. (1994). *How to conduct your own survey*. New York: John Wiley & Sons, Inc.
- Semerjian, L.L., El-Fadel, M. M., Zurayk, R.R., & Nuwayhid, I. I. (2004). Interdisciplinary Approach to Environmental Education. *Journal of Professional Issues in Engineering Education & Practice*, 130 (3), 173-181. Doi: 10.1061/(ASCE)1052-3928(2004)130:3(173)
- Stables, A. (2010). Making meaning and using natural resources: Education and sustainability. *Journal of Philosophy of Education*, 44(1), 137-151. doi:10.1111/j.1467-9752.2010.00749.x
- Urien, B., & Kilbourne, W. (2011). Generativity and self-enhancement values in eco-friendly behavioral intentions and environmentally responsible consumption behavior. *Psychology & Marketing*, 28(1), 69-90. doi:10.1002/mar.20381
- United Nations, (2011). The history of sustainable development in the United Nations. In *Rio +20 United Nations conference on sustainable development*. Retrieved from <http://www.uncsd2012.org/rio20/history.html>
- United Nations, (2008). Audiovisual library of international law. Retrieved from <http://untreaty.un.org/cod/avl/ha/dunche/dunche.html>

- United Nations, (1987). In *Report of the World Commission on Environment and Development: Our Common Future*. Retrieved from http://conspect.nl/pdf/Our_Common_Future-Brundtland_Report_1987.pdf
- United States Department of Energy. (2012). *Energy economy*. Retrieved from <http://energy.gov/public-services/energy-economy>
- United States Environmental Protection Agency. (2013). *EPA history*. Retrieved from <http://www2.epa.gov/aboutepa/epa-history>
- United States Government. (2012). *Track the money*. Recovery Act.gov (Website). Retrieved from http://www.recovery.gov/About/Pages/The_Act.aspx
- University Leaders for a Sustainable Future, (2008). *Brief history of the Talloires declaration*. Retrieved from http://www.ulsf.org/programs_talloires_history.html
- University of Arkansas (2010). *Letter of notification*. Fayetteville, Arkansas.
- University of Arkansas. (2012a). Retrieved from <http://admissions.uark.edu/>
- University of Arkansas. (2012b). Retrieved from <http://sustainability.uark.edu/>
- Vallerand, R. J., & Pelletier, L. G. (1992). The academic motivation scale: A measure of intrinsic, extrinsic, and amotivation in education. *Educational & Psychological Measurement*, 52(4), 1003.
- Van der Merwe, A. (2010). Does human capital theory account for individual higher education choice? *International Business and Economics Research Journal*, 9(6), 81-93.
- Verbenko, O. I. (2011). *Corporate social responsibility*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (UMI No. 3460248)
- Vormedal, I. (2011). From foe to friend? Business, the tipping point and U.S. climate politics. *Business and Politics*, 13 (3), 1-29. Doi: 10.2202/1469-3569.1350
- Wolfe, V. L. (2001). A survey of the environmental education of students in non-environmental majors at four-year institutions in the USA. *International Journal of Sustainability in Higher Education*, 2(4), 301-315.
- Zhang, J. J., Joglekar N. R., & Verma, R. (2012). Exploring resource efficiency benchmarks for environmental sustainability in hotels. *Cornell Hospitality Quarterly*, 53(3), 229-241. Doi: 10.1177/1938965512441165

Appendix A

Permission letter from Dr. Dierberger

Hello Dr. Dierberger,

I am a doctoral candidate at the University of Arkansas. I am writing a dissertation titled "Student Motivation for Selecting a Minor in Environmental Sustainability". In your dissertation, "Determination of informed choice and pathways leading to selection of the Environmental Studies major" you included a survey.

I am writing to request your permission to used modifications of some of the questions in your survey. I will reference your work in my dissertation of course. Could I please have your permission to do this?

Thank you so much for your consideration in this matter,

Luanne Lewis

Response:

Hi Luanne,

I'm pleased to hear someone is interested in student motivations for major selection besides me! I grant permission for you to use and modify the survey questions. Please make sure that someone in the Ag Leadership department at UN-Lincoln is aware also. I don't know who is around the department anymore.

Betsy Dierberger

Appendix B

Permission letter from Dr. Rogers

Hello Dr. Rogers,

I am a doctoral candidate at the University of Arkansas. I am writing a dissertation titled "Student Motivation for Selecting a Minor in Environmental Sustainability". In your dissertation "Selection of social work as an academic major among male and female undergraduate baccalaureate students" you have included a survey.

I am writing to request your permission to used modifications of some of the questions in your survey. I will reference your work in my dissertation of course. Could I please have your permission to do this?

Thank you so much for your consideration in this matter,

Luanne Lewis

Response:

Hi Luanne Lewis,

Thanks for your email. Yes you may modify the questionnaire for your purposes. I have also used this questionnaire with our new graduate social work students. I recently reported my finding about our graduate students in Sweden back in July. I am including both questionnaires for you in an attachment. You may modify either one to suit your purposes.

I wish you the best of luck in your defense and with your academic pursuits.

Respectfully,

Dr. LaTra Tracy Rogers, MSW., Ph.D.

Appendix C

Permission letter from Meredith College on behalf of L. Fieselman

To Meredith College for survey found on AASHE web site:

Hello,

I am a doctoral candidate at the University of Arkansas. I am writing a dissertation titled "Student Motivation for Selecting a Minor in Environmental Sustainability".

On the AASHE web site, I located a copy of the attached survey. I am not sure if it is copyrighted but felt I should request your permission. I am writing to request your permission to use modifications of some of the questions in your survey. I will reference your work in my dissertation of course. Could I please have your permission to do this?

Thank you so much for your consideration in this matter,

Luanne Lewis

Doctoral Candidate, University of Arkansas, EdD. Workforce Development program

Instructor, Educational Technology, UAFS

Secondary Education Coordinator, UAFS

Response:

Hello Luanne,

Thank you for your email. It is fine for you to use the survey in your research. Our sustainability coordinator position is currently open, so I am receiving the sustainability office emails as a member of the College's sustainability committee.

Please let me know if you have other questions.

Melyssa Allen

Appendix D

Memorandum of Approval from the University of Arkansas Institutional Review Board

November 13, 2012

MEMORANDUM

TO: Luanne Lewis
Kit Kacirek

FROM: Ro Windwalker
IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 12-11-231

Protocol Title: *Student Motivation for Pursuing a Minor in Environmental Sustainability*

Review Type: EXEMPT EXPEDITED FULL IRB

Approved Project Period: Start Date: 11/13/2012 Expiration Date: 11/12/2013

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (<http://vpred.uark.edu/210.php>). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 300 participants. If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or irb@uark.edu

Appendix E

Sustainability Program Enrollment: A Student's Perspective

The purpose for conducting this study is to explore the factors that motivate undergraduate students to pursue a minor in sustainability. Your responses will be completely anonymous, and only group data will be reported. By completing and submitting this survey, you are giving your consent for the researcher to use your responses to the survey. Your participation is voluntary and you maintain the right to withdraw from the survey at any time.

The survey should take no more than ten (10) minutes. You are asked to complete the survey and deposit it in the box at the front of the room. If you choose not to deposit the survey in the box, you may submit your survey via mail to Luanne Lewis

fax at (479) 424-6965. If you have questions or concerns about the survey, please contact me at lwlewis@uark.edu or my faculty advisor at either 479-575-4875 or kitk@uark.edu

Please complete the survey by marking a response to each question below.

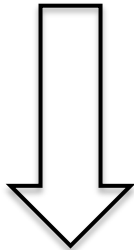
Part I. Declared Minor?

1. Which of the following **best** describes your current status relative to a minor in sustainability:

_____ I have declared a minor in sustainability.

_____ I plan to declare a minor in sustainability.

If you selected either of these two options, please continue completing the survey.



_____ I do **NOT** plan to declare a minor in sustainability.

_____ I plan to take some of the courses in the minor but I am unsure about declaring this minor.

If you selected either of these two options, you have completed the survey. Please return it to the box in the front of the classroom.



Part II: Why Sustainability?

Sustainability is defined as meeting the needs of the present without compromising the ability of future generations to meet their own needs.

Please circle the choice below that best represents your belief about declaring a minor in sustainability. Use the following scale to respond to the questions: **5= Strongly agree; 4= Agree; 3= Neither agree or disagree; 2= Disagree; 1= Strongly disagree.**

I believe declaring this minor in sustainability:

- | | | | | | | |
|-----|--|---|---|---|---|---|
| 2. | will increase my employment/career opportunities. | 5 | 4 | 3 | 2 | 1 |
| 3. | is occupationally relevant. | 5 | 4 | 3 | 2 | 1 |
| 4. | leads to an interesting and challenging career in Sustainability. | 5 | 4 | 3 | 2 | 1 |
| 5. | was influenced by another person (family, mentor, colleague, advisor, etc.) who believes pursuing this minor will increase my employment/career opportunities. | 5 | 4 | 3 | 2 | 1 |
| 6. | facilitates learning that is personally or spiritually rewarding. | 5 | 4 | 3 | 2 | 1 |
| 7. | facilitates learning about environmental issues. | 5 | 4 | 3 | 2 | 1 |
| 8. | addresses self-development to become literate in environmental sustainability. | 5 | 4 | 3 | 2 | 1 |
| 9. | complements my chosen major. | 5 | 4 | 3 | 2 | 1 |
| 10. | increases my salary potential. | 5 | 4 | 3 | 2 | 1 |
| 11. | increases my potential monetary benefits (retirement, medical, 401K, etc.) and potential socioeconomic/professional status. | 5 | 4 | 3 | 2 | 1 |
| 12. | increases my starting salary or long-term salary. | 5 | 4 | 3 | 2 | 1 |
| 13. | focuses on environmental practices that are economically beneficial locally and globally. | 5 | 4 | 3 | 2 | 1 |

14.	focuses on environmental practices that will make the world a better place.	5	4	3	2	1
15.	will better prepare me for the challenges of environmental issues or problems facing our world.	5	4	3	2	1
16.	was influenced by participation in environmental organizations prior to declaring this minor.	5	4	3	2	1
17.	was influenced by my desire to actively work toward sustainability.	5	4	3	2	1

Part III: About You

Please mark your choice below.

18. Which college listed below is associated with your **major** program of study?

Dale Bumpers College of Agricultural, Food and Life Sciences

Fay Jones School of Architecture

J. William Fulbright College of Arts and Sciences

Sam M. Walton College of Business

College of Education and Health Professions

College of Engineering

Other/do not know/choose not to answer.

19. What is your gender?

Female

Male

Choose not to answer

Thank you for your participation.

Appendix F

List of Experts for Establishing Survey Validity

Dr. Michael Miller
Associate Dean for Academics
College of Education and Health Professions
GRAD 320
University of Arkansas
Fayetteville, AR 72701

Dr. Kit Kacirek
Associate Professor/Program Coordinator for Doctoral Studies
Adult and Lifelong Learning Program
College of Education and Health Professionals
120 Graduate Education Building
University of Arkansas
Fayetteville, AR 72701

Dr. Jan Dickinson
Director of Assessment
College of Education
University of Arkansas Fort Smith
5201 Grand Avenue P.O. Box 3649
Fort Smith, AR 72913-3649

Dr. Kristine Garner
Assistant Professor
University of Arkansas Fort Smith
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Fort Smith, AR 72913-3649

Dr. Kim Gordon
Assistant Master Technical Instructor,
Workforce Leadership & Management (CBPD)
University of Arkansas Fort Smith
5201 Grand Avenue P.O. Box 3649
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Dr. Jerry West
Assistant Professor
University of Arkansas Fort Smith
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