SUSTAINABILITY DESIGN IN HIGHER EDUCATION:

CURRICULUM, TEACHING METHODS, AND PROGRAM INTEGRATION

By

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ABSTRACT

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Sustainability Design in Higher Education: Curriculum, Teaching Methods, and Program Integration

Dissertation Directed by Dr. Mark Baron

Due to the growing problems of an unsustainable world, this qualitative, phenomenological study was designed to investigate the process of developing and integrating sustainability curriculum into general education requirements in higher education. The researcher interviewed six participants from different parts of the world who had first-hand experience participating and directing a sustainability education program in order to better understand the process of teaching and learning sustainability. Specifically, the participants have not only practiced sustainability curriculum, but have also lived in a completely sustainable ecovillage. The interview data revealed participants' insights which gave multiple suggestions for designing curriculum and developing teaching methodology for a sustainability program within traditional higher education institutions. In addition, seven themes emerged from the interview responses revolving around sustainability curriculum: spontaneity, the three R's are good but not enough, difficulty, education at all levels, sustainability as a way of life, experiential learning methodology, and hope. The researcher found that education is the key to integrating sustainability into higher education, and experiential learning is the preferred methodology for teaching and learning sustainability.

The abstract of approximately 200 words is approved as to form and content. I recommend its publication.

Signed _____
Professor in Charge

DOCTORAL COMMITTEE

The members of the committee appointed to examine the dissertation of Brooke C. Sydow find it satisfactory and recommend that it be approved.

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DEDICATION

This dissertation is dedicated to my daughter. Even though you are not born yet, you have been my inspiration and motivation to complete this degree in a timely manner~ I cannot wait to meet you.

Love always,

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CHAPTER 1

Introduction

The term sustainability without any implied meanings is the capacity to endure. The Association for the Advancement of Sustainability in Higher Education (AASHE, 2011) defined sustainability as a comprehensive way of life that encompasses human and ecological health, social justice, a secure source of revenue, and an overall better world for all generations to come. In general, the concept can be thought of as up-keep, or maintenance; however, in an environmental focus, sustainability is all-inclusive of the body, earth, and survival. It focuses on societal, environmental, and economic aspects of maintaining a natural balance. According to Beringer and Adombent (2008), sustainability in higher education takes on many meanings; however, it typically refers to a green movement, or "reducing a university's ecological footprint and improving its sustainability performance" (p. 608). This is where one problem comes into play. Many universities are working toward sustainability, as in being green, but are not teaching their students how to be sustainable, self-sufficient members of communities and society.

Traditionally, in higher education students are being taught in a specialized way, which is counterproductive for sustainability. As a result, students are only being familiarized with one field which is leading to a decline in self-sufficiency and community. According to David Orr, chair of environmental studies at Oberlin College, educators need to "encourage education that teaches students to 'connect the dots,' to think in terms of the big picture and how they themselves fit into the systems and patterns of the environment" (Wakefield, 2003, p. A270). Because academia has the freedom to voice new ideas and transform fields of study, and higher education reaches masses of

people, the university setting is a prime place to engage in sustainable educational programs across the disciplines (Cortese, 2003). Further, because sustainability educational programs can be valuable opportunities for the distribution of ideas, behaviors, and practices to the greater community, Ballantyne, Fein, and Packer (2001) suggested implementing sustainability curriculum into university programs. By including sustainability within general curriculum across the disciplines, students will learn how to think holistically and entrepreneurially. Educators such as Mabry (2011) are starting to take action by tackling sustainability as a holistic approach to preparing students for the real world, and not just an act of 'going green.'

The hype of going green is everywhere. But why is this and what does it really mean? Going green is a trendy way to look at sustainability, which seems to be at the root of all 'green' themes. However, going green is not the only solution, and sustainability is much deeper than 'going green.' When focusing on sustainability, one must consider the triple bottom line. The triple bottom line (TBL) term was created by John Elkington in his 1998 book, *Cannibals with Forks: The Triple Bottom Line of 21st Century Business.* Elkington originally used the term in reference to a business approach that includes environmental, social, and economic objectives.

However, the concept has been adapted to include different levels and contexts. Colbert and Kurucz (2007) studied business' conceptions of the triple bottom line in the workplace and found that three major themes emerged. First, the researchers discovered that many businesses focus on making a profit by encouraging freedom in choice for stakeholders. Secondly, they found that businesses try to integrate interaction of the stakeholders' interests, specifically addressing the employees, customers, investors,

communities, and suppliers. Lastly, Colbert and Kurucz found that some businesses try to create leverage with their stakeholders by integrating a global model that seeks to remedy global problems while still making a profit. Based on these variations, it is evident that the premise of the triple bottom line in the business place has veered away from its original focus on the planet, people, and prosperity (McConnel & Abel, 2008), revealing a need for the triple bottom line to be refocused to embrace the three pillars of sustainability, (the economy, social equity, and the environment) (Stenzel, 2010). In addition research supports that human health should be included in the core of sustainability. Samuel (2008) found that social and physical components of the environment contribute to the overall health of all species and should be carefully considered for a sustainable future. Specifically, human health can be harmed through poor working conditions, toxic substances, irritants, infectious agents, poor water and air quality, chemically enhanced foods and ineffective waste management (Samuel).

Stenzel (2010) stated that sustainability is not just a hype, or buzzword, it is vital for the existence of our earth. Because there are so many global issues that are affecting human community, the economy, and the planet, it is becoming more urgent to learn how to combat these issues at a local level. Much of the world's turmoil is a result of dependence, convenience, and ignorance. Human beings have forgotten how to survive on their own. In general, sufficiency as a community is lacking. Part of relearning to be self-sufficient as a community is learning how to be sustainable, and part of learning sustainability is the desire to make a difference.

The term sustainability without any implied meanings is the capacity to endure. The Association for the Advancement of Sustainability in Higher Education (AASHE,

2011) defined sustainability as a comprehensive way of life that encompasses human and ecological health, social justice, a secure source of revenue, and an overall better world for all generations to come. In general, the concept can be thought of as up-keep, or maintenance; however, in an environmental focus, sustainability is all-inclusive of the body, earth, and survival. It focuses on societal, environmental, and economic aspects of maintaining a natural balance. According to Beringer and Adombent (2008), sustainability in higher education takes on many meanings; however, it typically refers to a green movement, or "reducing a university's ecological footprint and improving its sustainability performance" (p. 608). This is where one problem comes into play. Many universities are working toward sustainability, as in being green, but are not teaching their students how to be sustainable, self-sufficient members of communities and society (Gadotti, 2010).

For the purpose of this study, sustainability is defined as a holistic approach to self-sufficiency through means of permaculture, which includes a balance of societal, environmental, economic, and healthful needs. Specifically, the researcher investigated each of the three pillars of sustainability, as well as sustainability as it contributes to human health.

According to Bill Mollison (1991), an Australian ecologist, and one of his students, David Holmgren, permaculture is defined as a design system for creating sustainable human environments, and is a contraction of "permanent agriculture" or "permanent culture." Permaculture can also be explained as a sustainable design system stressing the harmonious interrelationship of humans, plants, animals, and the Earth (Barnes, 1996; Diver, 2002).

The multiple definitions and perspectives on sustainability reveal that sustainability is becoming more apparent across the world, but to what extent? Greening campuses and reducing the ecological footprint are steps towards sustainability, but without the actual practice of teaching students how to be and live sustainably, the complications that are causing a need for sustainable measures are not going to go away. Specifically, global problems such as peak oil a failing economy, the decreasing value of the United States dollar, terrorism, climate change, and the effects of chemical usage on human, animal, and plant species are contributing to damaging local effects, which seem to be only increasing in severity (Campbell, 2008; Mercola, 2011; & Warren, 2008). Currently, as higher education increasingly focuses on specializing students in one area and introduces them to a theory-based world, these problems are escalating. Gadotti (2010) suggested that higher education must reorient curriculum and teaching methodology toward sustainability because the current education practices are guiding students toward unsustainable means of living.

The United Nations Educational, Scientific, and Cultural Organization (UNESCO, 2004) reaffirmed the need to reposition all levels of education to include a culture of peace and sustainability. Additionally, Gadiotti (2010) stated that many educational programs promote unsustainable practices and do not evoke a reason for students to become interested in sustainability. Moreover, Brandao (2008) revealed a need for reorienting education to include sustainable practices. He suggested that students are lacking the skills to problem solve, are not self-sufficient, and are destructive of themselves, society, and the environment. Further, he opined that students are being taught individualistically and should be taught to think inclusively and holistically.

Specifically, Brandao promoted reorienting education to include a "free, fair, inclusive, and solidarity way to get people together in order to build their social living world at the same time they handle, manage, or transform the natural sustainable environments where they live and on which they depend to live and be together" (p. 136).

As a result, Gadotti (2010) recommended that higher education needs to create a new pedagogy (edopedagogy) that is comprised of education practices that are based on sustainability and works to foster transformational learning. Therefore, there is a need for educators to incorporate methods of sustainability into their curricula across the disciplines, not just in one or two areas. In addition to shifting major-specific curriculum to include sustainable components and practices, general education needs to morph into teaching students how to be responsible consumers and producers beyond the superficial layers of reducing, reusing, and recycling, to teaching students how to live in, understand, and protect one's social and natural environments (Gadotti). The goal for this was to review sustainability curricula and to investigate teaching methodologies for incorporating sustainability into existing general education.

According to Ebong (2002), there has been an increasing concern about the overall apprehension of the environment and the ramifications of ignoring it. As a result of this awareness, multiple organizations are voicing their concern through activism and campaigning. However, despite the demand for widespread changes to enhance environmental health qualities through developmental strategies, policies, and laws, the achievement is minimal (Ebong). The lack of progress in these areas could be for many reasons, including the difficulty level and time commitment (Ceulemans & De Prins,

2010), as well as the general population's knowledge, or lack thereof, regarding sustainability (AASHE, 2011).

Researchers have been expressing concern about the lack of knowledge on sustainability as it applies holistically. In many other countries sustainability is already receiving more recognizable attention. Brazil, Australia, India, Costa Rica, Israel, Mexico, Peru, Scotland, and many other countries have specific programs that teach people about sustainability through active, on-site learning (Living Routes, 2011). Within the United States there are also specific programs, but they are not widespread or widely known throughout the entire country.

In order for sustainability advocates in American higher education to move forward, there must first be an understanding of the importance of implementing sustainable practices into everyday customs. Because the term sustainability is so broadly used specific knowledge of how to be sustainable is very nebulous for many people. Therefore, the researcher hopes to gain an understanding of curriculum design, teaching methods, and integration strategies of successful sustainability programs in higher education.

Statement of the Problem

The problem is multi-faceted and exacerbated by the traditional instructional approach of higher education (Gadiotti, 2010; Matson, 2009). First, an overarching problem is that life as one knows it is changing. Health and environmental issues, an ever-increasing growing human population, an over-abundance of consumption, a failing economy, peak oil prices, a lack of human efficiency and sufficiency, and many other problems are all part of the downward spiral of a lack of sustainability within our country

(Matson, 2009). According to several educational experts, another major problem is that many sustainability classes, and even programs that attempt to educate on sustainability, are not reaching the masses, as only those students who are interested in sustainability in the first place are taking them (UMAS, 2012). Oftentimes, sustainability classes are not taught through a holistic approach; rather, they are taught as separate entities tacked on to curriculum with a superficial overlay. Furthermore, another major problem with becoming sustainable is the lack of knowledge and interest in learning how to teach sustainable living (Ebong, 2002). Many universities are teaching classes or programs on sustainability; however, these classes and programs are not widespread and are only reaching a very small percentage of people (AASHE, 2011). Therefore, the problem is not just that there are global issues and the lack of knowledge among people, or that sustainability classes and programs are not comprehensive, widespread, and well known; it becomes a severe crisis when all of these act together in a detrimental combination (Ebong, Haugh, & Talwar, 2010; Wiek, Withycombe, Redman, & Banas-Mills, 2011). As a result, the purpose of this study was to investigate how educators integrate sustainability into general education to help mitigate these problems.

Purpose of the Study

This phenomenological study explored the need for widespread sustainability, investigate curriculum and teaching methods of successful sustainability programs across the academic disciplines, and reveal effective practices for teaching sustainability in general education. The Grand Tour Question for this research is, *"What is the process of building holistic sustainability curriculum, and how can it be taught across the disciplines in higher education?"* The following research questions guided the study:

Research Question:

1. What is sustainability?
2. Why do we need to practice sustainability?
3. Why is it urgent to incorporate sustainability into curriculum?
4. What are the reasons for widespread change within higher education?
5. What tasks are required to develop curriculum for successful sustainability courses?
6. What instructional methods are appropriate for incorporating sustainability in multidisciplinary courses?
7. How could sustainability be incorporated into existing general education curriculum?
8. Which elements comprise successful sustainability programs?
9. How do institutions successfully initiate sustainability programs?
10. How do institutions assess the success of sustainability programs?
11. How do institutions successfully maintain sustainability programs?

Significance of the Study

Research indicates that there are many problems associated with the lack of initiative on sustainable practices and the lack of knowledge of sustainability. Wiek et al. (2011) found that sea-level rise, desertification, poverty, lack of education, and other complexities result from dynamic cause and effect chains from local to global inadequacies in sustainability. Largely because of serious pandemics, researchers have become grossly aware of our inability to 'fix' these problems. In general, even larger problems arise when the 'fix' tends to be linked to the outcomes of these problems, and

not the root cause of the problem, ultimately, leading to a substantial need for educational programs focusing heavily on sustainability (Wiek et al.). This indicates a strong need for a base understanding of where to start at South Dakota regental universities. Haugh and Talwar (2010) found a specific need for education to expand on the basic principles of sustainability, and recommended that practitioners incorporate sustainability into teaching and learning activities with the purpose of increasing awareness and knowledge of sustainability. By including sustainability within general curriculum across campus, students will learn how to think holistically and entrepreneurially. Matson (2009) suggested that sustainability efforts need to include discipline experts from every field to ensure knowledge, perspectives, and proper tools are used to create the master plan of sustainability. Educators such as Mabry (2011) are starting to take action by tackling sustainability as a holistic approach to preparing students for the real world.

Further, the research overwhelmingly supports an interdisciplinary focus in sustainability programs worldwide (Blewitt, 2004; Bosselmann, 2001; Ceulemans & De Prins, 2010; Junyent & Geli de Ciurana, 2008). By investigating curriculum development and teaching methods of sustainability programs, this research could lead to suggested methods of implementation for traditional curriculum. In addition, the study will contribute to the existing body of knowledge of sustainability comprehension and measures of inclusion for curriculum in higher education. The researcher hopes to learn the key components of successful sustainability curriculum, best teaching practices, and methods of integration into existing curriculum. This information may be useful to universities and educators hoping to incorporate sustainability into general education, as well as students desiring to advance in sustainable practices.

Definition of Terms

Definitions are provided for the reader to warrant a common understanding and consistency of terms used throughout the study. Definitions that are not accompanied by a citation are original and developed by the researcher.

AASHE: Association for the Advancement of Sustainability in Higher Education is an organized group of higher education institutions that are actively working to promote and maintain a sustainable future. Introduced in 2005, AASHE's many colleges and universities collaborate to empower all higher education institutes to make the transformational change through educating, researching, supporting, and advocating for a holistic approach to sustainability (AASHE, 2011).

APT: Accredited Permaculture Training provides a mechanism for gaining a Nationally Recognised certificate in permaculture. It is recognised by the Australian Quality Training Framework, the government body responsible for accrediting vocational training (http://www.cydoniapermaculture.com.au/, 2011).

Environmental Justice: Based on the principle that all people have a right to be protected from environmental pollution and to live in and enjoy a clean and healthful environment, environmental justice is the equal protection and meaningful involvement of all people with respect to the development, implementation and enforcement of environmental laws, regulations and policies and the equitable distribution of environmental benefits. (Commonwealth of Massachusetts, 2002).

Experiential Learning: Learning from one's experiences

Glocal: Connecting globalization to local thinking.

Just Sustainability: The linkage between environmental justice and sustainability (Agyeman & Warner, 2002).

Permaculture: A design system for creating sustainable human environments: a contraction of "permanent agriculture" or "permanent culture" (Mollison, 1991).

PDC: Permaculture Design Certificates are usually earned through a permaculture course by means of a hands-on permaculture training program.

Self-Directed Learning: The learner takes the initiative to learn on their own.

Sustainability: A holistic approach to self-sufficiency through means of permaculture, which includes a balance of societal, environmental, economic, and healthful needs.

Systems Thinking: A way of thinking that looks at individual parts and how they influence each other as a whole.

Three Pillars of Sustainability: Environment, Economic, and Social Sustainability seeks to develop and implement the methods and behaviors that balance the consumption of resources with the impact of that consumption on the environment—in an economically viable manner and one that enhances the quality of life (Parsons, 2011).

Transformative Learning: Learning that induces more far-reaching change in the learner than other kinds of learning, especially learning experiences which shape the learner and produce a significant impact, or paradigm shift, which affects the learner's subsequent experiences (Clark, 1993).

Triple Bottom Line (TBL): A business approach that includes environmental, social, and economic objectives (Elkington, 1998).

UNESCO: United Nations Educational, Scientific and Cultural Organization.

Limitations/Delimitations

This study may have been limited by the number of sustainability program directors willing to participate in an interview. The researcher delimited the study to only interviewing program directors that teach successful holistic sustainability programs.

Organization of the Study

This qualitative study is divided into five traditional chapters with several subsections. The first chapter introduced the study through sections including the problem statement, purpose of the study, research questions, significance of the study, definition of terms, and possible limitations and delimitations. The literature review in Chapter 2 develops a need for sustainability in higher education, an explanation of existing programs and curricula (including content and teaching methodologies), and common practices in teaching sustainability. Chapter 3 presents the methodology of this study including the literature review, participants, research design, and data collection and analysis. Chapter 4 analyzes and break down the findings, which will be followed by a summary of the study, conclusions, discussion, ideas for practical application, and recommendations for future studies in Chapter 5.

CHAPTER 2

Review of Literature

Chapter 2 presents the reader with a comprehensive review of the related literature and research regarding student and faculty understanding of sustainability within higher education, and commonalities among successful higher education sustainability programs. For the purpose of this study, sustainability is defined as a holistic approach to self-sufficiency that includes a balance of societal, environmental, economic, and healthful needs.

The literature review explains sustainability, permaculture, and other relevant terms, in addition to taking a comprehensive look at what is causing the need and benefits of a more sustainable focus. The literature review examines curriculum and teaching methodologies of successful sustainability programs, and include methods of integrating sustainability design into traditional curriculum. The review is presented in the following sections: sustainability origins and overview, including sustainability and permaculture definitions, the need for sustainability, and benefits of sustainability; sustainability within higher education, including classes and programs, curriculum, and best teaching practices; and a discussion of the adult learner and teaching methodology, including the adult learner, learning styles, teaching methodologies, how to incorporate sustainability into existing general education, and curriculum requirements.

Sustainability/Permaculture Overview and Origins

Sustainability is a nebulous term used in many different ways based on three main concepts including society, the environment, and the economy. A simplistic look at sustainability is the ability to endure or withstand. Environmental sustainability

addresses the need to sustain our environment today for tomorrow. However, sustainability cannot solely focus on the ability to sustain, or the simplicity of 'green' or an environmental concern; the definition needs to address society. According to Agyeman and Warner (2002), a sustainable society addresses social needs and welfare, and economic opportunities are directly related to environmental regulations that are enforced by supporting ecosystems. According to Smith (2011) sustainability has to be created through an understood combination of social, economic, and environmental dimensions that promote the well-being of all life systems. In other words, these core components of sustainability must work together, be interdependent, and overlap.

Further, two major resources, the Association for the Advancement of Sustainability in Higher Education (AASHE) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) define sustainability in different ways. AASHE (2011) stated that sustainability is a comprehensive way of life that encompasses human and ecological health, social justice, a secure source of revenue, and an overall better world for all generations to come.

Alternatively, researchers, such as Junyent and Geli de Ciurana (2008) cited sustainable development as, "A world where everyone has the opportunity to benefit from education and learn values, behaviour* and lifestyles required for a sustainable future and for positive societal transformation" (UNESCO, 2004, p. 4). In addition, Kuhlman and Farrington (2010) defined sustainability as what, and the quality of what, we leave behind. Specifically, "the matter of what resources—natural resources, quality of the environment, and capital—we bequeath to coming generations" (Kuhlman & Farrington, 2010, p. 3443).

Definitions such as the aforementioned lend themselves nicely to the incorporation of permaculture into sustainability. Permaculture is a term coined by Bill Mollison and his student David Holmgren. Specifically, Mollison (1991) combined permanent agriculture and permanent culture as a design system for creating sustainable human environments, which he labeled permaculture. According to Sullivan (2008) in an interview with Holmgren, "the concept grew out of a deep concern about the widespread use of destructive industrial and agricultural methods that poisoned land and water, reduced biodiversity, and removed billions of tons of soil from previously fertile landscapes" (p. 144).

The Permaculture Institute (PI) defined permaculture as a design system that is ecologically designed around all aspects of human existence. Further, permaculture is designed to teach humans to live naturally through growing organic food, building natural habitats, capturing and utilizing rain water, restore ecosystems and landscapes, and to build community (Permaculture Institute, 2011). Permaculture can also be defined as, "as the use of ecology as the basis for designing integrated systems of food production, housing, appropriate technology, and community development" (Praetorius, 2006, p. 6). Further, permaculture is described as a set of principles, or continually evolving ideas, that can be applied to the designing of homes, buildings, cities, gardens, ecosystems, and any other structure (Rios, 2010).

As stated, sustainability and permaculture do not share one uniform definition. For this reason, a major problem associated with sustainability is the lack of knowledge and understanding of the practice, what is involved, and why it is crucially important.

Need and Benefits of Sustainability

Many researchers have investigated the level of knowledge among students and faculty on sustainable topics such as climate change, energy usage, and leaving a carbon footprint (Ruy & Brody, 2006), and living independently and efficiently (AASHE, 2011). Overwhelmingly, responses are similar. Many students and faculty only see sustainability as an act of 'being green,' and not a way of living.

The Energy Management Office of Sustainability at North Carolina State University (NC) conducted a survey to determine students' knowledge and attitude toward sustainability issues. The researchers measured attitudes and existing behaviors on the topics of sustainability, energy, transportation, waste reduction, and recycling (AASHE, 2011). The study revealed a positive relationship between student interest and attitude toward sustainable measures, such as energy conservation, recycling, and transportation. However, the survey did not include any sort of component that reflected sustainability as a way of living.

The researchers asked students about their understanding of sustainability and the majority of students reported that sustainability is environmental/natural resources, conservation/recycling, and ability to sustain life on earth. Specifically, 46% of students responded that sustainability meant, "Meeting the needs of the present without compromising the ability of future generations to meet their needs" (p. 19). However, when asked what motivated students to participate in sustainable practices, the majority of students admitted that saving money was the number one reason why they practiced limited, if any, sustainable practices. North Carolina State University's research revealed the perceived unimportance of the holistic sustainability focus.

Studies from around the world address the lack of knowledge and overall importance of sustainability. Ceulemans and De Prins (2010) reported the lack of knowledge among educators is due to several obstacles within higher education. Specifically, Lidgren, Rodhe, and Huisingh (2006) emphasized that due to the multidisciplinary approach to sustainability, the misunderstanding of sustainability, and the general essence that sustainability is not seen as a core issue, incorporating sustainability into higher education has been a difficult task. Further, Cortese (2003) found that the problem is not just that sustainability is difficult to implement into higher education. Cortese reported that signals of damaging humane activity are incomplete, inaccurate, or are discovered too late to prevent human damage. The problem stems from a lack of knowledge and immediacy.

According to Ceulemans and De Prins (2010), teaching sustainability is a difficult task because of the multi-disciplinary approach needed to properly get the importance across, and the slow return rate of actions. In order for sustainability components to be incorporated across the disciplines, most educators would need to be re-trained to think of sustainability as a core issue in their field of study. Many educators have not been concerned with incorporating sustainability concepts into their curricula because there is not an immediate result, and there is a lack of awareness of the importance of education for sustainable development. Also, due to workload restrictions and the lack of desire for change, teaching an over-arching approach to sustainability is difficult to incorporate into traditional higher education (Ceulemans & Prins). However, in general, the global concern on sustainable practices is increasing because of environmental degradation, pollution, negative effects on human health, and the concern of a failing American

economy. Similarly, Taylor (2012) introduced hot global topics such as politics and policy, natural resource depletion, population and consumption control, and poverty. With matters such as these, much speculation circulates on life as we know it. Warren (2008) warned the general public that if significant changes do not occur, the middle class or individuals that do not have the means to be self-sufficient are very likely to fall into poverty if one major thing goes awry in their lives.

Given that the cost of living has increased and general wages have not followed suit, it is evident that there needs to be a significant change (Warren, 2008). One of the best ways to implement widespread change is through education. What this means is that higher education needs to make a significant focal shift to educate individuals how to live sustainably. Warren stated that academics and politics must realign interests and alliances to better prepare individuals for the future. Warren predicted that if trends continue, the majority of the middle class population will fall into poverty. Wakefield (2003) also supported this notion of change in higher education. Her research found that in order to combat poverty, people must be educated on sustainability. Wakefield quoted David Orr, chair of environmental studies at Oberlin College, stating that students must learn how to "connect the dots, to think in terms of the big picture, and how they themselves fit into the system and patterns of the environment" (p. A270).

Traditional higher education thrives on solving many of the world's difficulties by exposing students to a well-rounded education. Myers and Beringer (2010) stated that a major goal of education is to acquaint students with many social settings, allowing them to gain experience and multiple perspectives. However, as many university curricula

appear to have shifted to training students to become very specialized in one area, it seems that there is a vast missing component in higher education.

Specifically, Cortese (2003) reported that,

> Much of higher education stresses individual learning and competition, resulting in professionals who are ill-prepared for cooperative efforts. Learning is fragmented, and faculty, responding to long-established incentives (e.g., tenure, research) and professional practices, are often discouraged from extending their work into other disciplines or inviting interdisciplinary collaboration. (p. 16)

Even with general education requirements at a typical higher education institute, students are still expected to become major specific, which results in the lack of 'general' knowledge that students learn. In particular, in the eyes of a specialized education, students are not being trained to 'see' how global problems are creating local effects. The problem is widespread and multi-faceted.

Initially, globalization resulted in a major paradigm shift in higher education. The past 25 years have led to highly specialized jobs due to global education and inexpensive mobility of products and goods. However, as oil prices increase and we embark on a downward spiraling economy, it will become more important for students to learn how to be self-sufficient. If globalization slows down due to high energy costs and effects such as climate change, collectively, higher education institutes will be looking at a significant shift: a shift to teaching with a more sustainable focus.

However, currently at South Dakota regental universities there are only a small number of sustainable practices conducted, and those practices are only followed through by a small group of people. According to the *International Consultants' Report* (2010),

SDSU is approximately 20 years behind in international practices. Since most developed countries are ahead of the United States in sustainable practices, it can be reasonably assumed that SDSU is also behind in sustainable practices. South Dakota State University does have a sustainability committee; however, measures of sustainability are few and far between. Typical superficial measures such as limited recycle bins, some water conservation, and occasional use of recycled paper products are semi-implemented, but are not enforced. Therefore, students are not gaining awareness of holistic sustainability or learning how to be self-sufficient and why it is important.

Another problem within many traditional higher education institutes has been that students and educators come to the understanding that global problems are only solved by colossal efforts or resolved on a global scale. Because many students and educators have these impressions, higher education institutions needs to provide students with training on how to be global thinkers on a local scale, self-sufficient and sustainable, service oriented, and entrepreneurially focused. Further, general education must shift to include a 'glocal' approach to global concerns that are having local effects. The word glocal has been used to help students and educators realize the connectivity between the large-scale problems and their effects locally. Collins and Kearins (2010) stated that the popular phrase, "think globally, act locally," represents the worldwide trans-boundary nature of ecological problems and the need for concentrated local action to combat them. However, there are many barriers to implementing sustainable practices into existing curriculum.

Sammalisto and Lindhqvist (2007) found that administrative support is necessary for successful sustainability practices within higher education. The researchers also stated

the time-consuming importance of reflection and feedback through the learning process. In addition to administrative support, educators and students must also buy in to the notion that sustainability training is necessary. Researchers indicate that this is simply not happening. According to Junyent and Geli de Ciurana (2008), "there are not enough graduates with the skills necessary for addressing the sustainability challenges within the corporate sector" (p. 780). Further, research indicates that not all students are accepting of sustainability practices. Myers and Beringer (2010) found that instructors must be prepared for student and parent resistance to such a drastic change in traditional higher education. The study revealed a significant need for educators to teach to different learning styles. As sustainability is an ambiguous term, all teaching methodologies also must be considered. In addition, Myers and Beringer found that "sustainability calls for new levels of intellectual challenge appropriate to ill-structured problems" (p. 780) and sometimes students do not want to push themselves to such a level. Lastly, because sustainability is such a complex topic, it requires social change and an alternative viewpoint. With change comes uncertainty, and with uncertainty comes negativity. Ebong (2002) found that one of the best ways to change a negative attitude is through education.

Unfortunately, this problem does not only lend itself to students and faculty in higher education; the general population and business world also echo the general lack of knowledge, negativity, and uncertainty on holistic sustainability. Colbert and Kurucz (2007) studied business' conceptions of the triple bottom line (TBL) associated with the three pillars of sustainability in the workplace, and found that businesses were more interested in sustaining their stakeholders' interests and profits then they were with

respecting the sustainable TBL. In addition, Ebong (2002) found that more education is needed among citizens to provide a more positive feeling toward their environment that not only promotes sustainability, but also healthy living. Ebong's research revealed that citizens knew very little about the benefits of healthy, sustainable living and, therefore, believed that there was not any reason to practice sustainability. Due to the connection of ignorance and negative attitude, Ebong predicted that general education will promote a more positive, accepting attitude of sustainable practices.

For these reasons, the researcher believes it is necessary to integrate sustainability into traditional general education requirements in order to combat ignorance and negative attitude toward sustainable change. In addition, the researcher believes that higher education institutions must not only embed sustainability curriculum into general education, but also invest in teacher training for appropriate teaching methodology of holistic sustainability living. If general education becomes the forefront for sustainability measures, then the entire student body, and therefore, future of our planet, will be introduced to a sustainable existence and why it is largely important. Further, by educating on sustainability, higher education will be taking a proactive approach to the detrimental problems associated with unsustainable practices.

As sustainability is directly linked to ecological balance with a focus on preservation for the future, a lack of sustainability leads to a series of devastating problems. According to Wiek et al. (2011), problems associated with a lack of sustainability can be related to "sea-level rise, desertification, poverty, lack of education, pandemics, or military conflicts result from complex, dynamic cause–effect chains" (p. 3). Taylor (2012) examined clashing viewpoints on sustainability such as global issues

revolving around standard of living, fighting economies, and poverty. Due to the downward spiral of the United States' economy, a decrease in a typical family's spending money is becoming more wide spread, forcing many middle class citizens towards poverty status. Warren (2008) provided a sobering list of statistics revealing the economy's downward spiral since 2000. Median family income has barely increased, while costs of mortgages, health insurance, and fuel have steadily amplified over the last decade. Specifically, Warren predicted that if education's focus does not shift to a more sustainable set of principles, most of the middle class will eventually slip into poverty.

In addition to the concern of poverty is human, animal, and plant health. Numerous reports in books, magazines, academic articles, newspapers, television specials, and online discussion revolve around effects of unsustainability. Unsustainability can be found everywhere. The dangers of unsustainability are overwhelming, and include economic, health, environmental, and social impacts.

Steffen (2006) reported that more people are dying from the effects of climate change than from terrorism. Murphy (2002) suggested that human activity such as the burning of fossil fuels is causing an increased amount of carbon dioxide, which is causing the earth's temperature to increase. Due to this shift in climate there are many possible implications, some of which we are already experiencing. Murphy listed an increase in frequency and intensity in storms, an increase in mosquito-borne disease, a rise in sea-level (causing flooding, and changes in habitat which can lead to possible extinction of plant and animal species), and an increase or decrease in precipitation depending on geographical location as direct effects of climate change. Although there is a controversial spectrum of literature on global warming and climate change, evidence does

support a change in the global temperature. Good, bad, or indifferent, necessary or unnecessary, the climate is changing, and it appears to be at a heightened rate due to human activity, in particular the burning of fossil fuels (Murphy).

In addition to climate change due to human activity, Saillant (2004) presented themes such as an increase in birth mutations, infertility, cancer-causing chemical use, desert land, and an overwhelming number of coral reefs dying, all of which can be attributed to human activity and consumption. A plethora of literature supports the connection of myriad health problems and chemical exposure. Researchers such as Wilson and Scwarman (2009) addressed the widespread use of chemicals throughout the environment, economy, and community. Specifically, industrial chemicals such as pesticides, herbicides, common household cleaners, air fresheners, and food additives enter our ecological and biological systems daily. Because of the this widespread chemical use throughout society, many harmful industrial chemicals come in contact with people in the workplace and home, through the use of everyday products, and through breathing, drinking, and eating (Wilson & Scwarman). New product and chemical laws are beginning to gain immediate need for concern in foreign countries, but are slow to catch on in the United States. This could be due to the lack of testing of some chemicals. Burdett (2011) reported the use of flavorless food additives that are in the form of neurological chemicals that trick the brain into believing there is a sweet, salty, or other type of flavor. According to the Weston A. Price Foundation, due to the small amount of these flavor enhancers needed to do trick the brain, the Food and Drug Administration (FDA) only has to put these products through three months of rat testing before they are considered acceptable for human consumption (Burdette, 2011). In addition, these

ingredients do not have to be specifically listed on food labels; simply lumping them together in the generic term 'artificial flavors' meets FDA requirements (Mercola, 2011).

Although there is not direct research supporting the linkage of these particular food additives to severe health problems, research does link chemical intake of any sort to health problems of all kinds. Wilson and Scwarman (2009) suggested that the rising number of people and animals being diagnosed with cancers, asthma and food allergies, and developmental disorders are linked to chemical exposure. Research across the world, specifically at Princeton University, encourages sustainability and eating organic foods to promote benefits for people, animals, and the environment. Health risks associated with chemical residues found on most crops, supplemental hormones injected into foods, and overuse of antibiotics in animals can be drastically reduced by consuming organic foods. Sustainability practices encourage the intake of organic, wholesome foods for the betterment of humanity. Matson (2009) stated,

> One of the greatest challenges confronting humanity in the 21st century is sustainability: how to meet the basic needs of people for food, energy, water, and shelter without degrading the planet's life support infrastructure, its atmosphere and water resources, the climate system, and species and ecosystems on land and in the oceans on which we and future generations will rely. (p. 39)

In addition, Astyk argued that food security will be an escalating, inconceivable issue of this century (Lum, 2011). The researcher found that infrastructure of modern industrial agriculture, with mass-cooperate farms, is in danger of collapsing, and the political wealth of the 'green' transformation, which was dependent on cheap and abundant oil and natural gas, is unsustainable (Lum, 2011). For these reasons, educators need to

embrace the sustainability challenge, and incorporate sustainable practices into general education.

Educational theory and innovative practices frequently emerge from research programs and academic investigation (Junyent & Geli de Ciurana, 2008). Sustainable development needs to become an innermost priority in shaping areas of research and development within higher education. Educators can be vital to this process. Embedding environmental responsibility in the curriculum of university graduates will play a key role in the advancement of the general public towards an immediate sustainable future. "This sensitization is urgent because of the significant time lag between research programs and putting usable results into practice," (UNESCO, 2004, p. 22).

Sustainability within Higher Education

In higher education, sustainability is defined in a magnitude of ways, which results in a plethora of post-secondary programs that boast sustainability. Programs range from simple certifications to advanced degrees focusing on one or more aspects of sustainability. Specifically, higher education institutions offer nearly the full spectrum of sustainability studies. Specializations, minors, bachelor's degrees, master's degrees, and doctoral degrees are all found within the Association for the Advancement of Sustainability in Higher Education (AASHE).

The AASHE is an organized group of higher education institutions that are actively working to promote and maintain a sustainable future. Introduced in 2005, AASHE's many colleges and universities collaborate to empower all higher education institutions to make the transformational change through educating, researching, supporting, and advocating for a holistic approach to sustainability. According to

AASHE (2011), there are approximately 165 certification, 35 bachelor, 25 master, and seven doctoral programs that are interdisciplinary in nature, but focus on sustainability. However, none of these programs offers a permaculture design certificate (PDC) in conjunction with a four-year degree. Likewise, there are many PDC programs that do not offer a traditional higher education diploma. For example, the Permaculture Institute boasts very detailed courses, certifications, teaching practices, and many other experiences to acquaint students with permaculture; however, there is not a degree program associated.

The theory of practicing permaculture revolves around food forests and guilds, poultry and backyard animals, rainwater collection and use, natural design and sustainable design for multiple functions, heirloom species of plants and animals, watershed restoration, and waste management (Permaculture Institute, 2011). In order to make sense of these categories, it is important to examine specific curriculum for teaching students how to understand permaculture. According to David Holmgren, students must learn how to observe and interact, catch and store energy, obtain a yield, apply self-regulation and accept feedback, use and value renewable resources and services, produce no waste, design from patterns to details, integrate rather than segregate, use small and slow solutions, use and value diversity, use edges and value the marginal, and lastly, creatively use and respond to change (Permaculture Institute, 2011). Another perspective that draws from Holmgren's original set of principles is Toby Hemenway's teaching of permaculture.

Hemenway concentrates on integrating permaculture principles into education through teaching how to observe, connect to, and use relative location, catching and

storing energy and materials, the ability to understand how each element performs multiple functions and how each function is supported by multiple elements, how to make the least amount of change for the greatest effect, the use of small scale but intensive systems, the use and effect of edges, accelerating succession, the use of biological and renewable resources, recycling energy, the ability to change problems into solutions, to obtain a yield, to understand that abundance is limited, and to understand that mistakes are tools for learning (Permaculture Institute, 2011).

Despite the detailed content for permaculture design certification, the Permaculture Institute does not provide an all-inclusive approach for holistic sustainable education. Even if they did, there is still a massive void in reaching the masses. According to Mabry (2011) there is a growing public interest in environmental, social, and economic sustainability; however, there is still a lack of comprehensive programs in the mainstream of higher education. In order to embed sustainability knowledge in the future generation, higher education must take a proactive approach; post-secondary general education requirements need to include practices and principles of sustainability and permaculture. Specifically, Praetorius (2006) encouraged incorporation of hands-on permaculture practices into sustainability so that students are empowered with skill and cognitive knowledge to put sustainability at the forefront of their lives.

A transformation of higher education is clearly needed, but the role of disciplines goes largely unmentioned. It is not about teaching all new content; it is about creating a new viewpoint to existing curriculum. Common curriculum for teaching sustainability begins with a general introduction to sustainability and how it relates to every discipline.

This introductory period often includes the need and importance of sustainability due to global problems contributing to local issues and the initiation of critical systems thinking.

When teaching the importance of sustainability it is necessary to emphasize a more holistic perspective; how individuals need to work together. One problem of existing sustainability courses or business practices is that traditionally "sustainability practices and policies have focused mainly on reducing unsustainability rather than strengthening the systemic underpinnings of sustainability" (Fiksel, 2012, p. 360). Critical systems thinking (CST) relies heavily on an understanding that ecosystems, human development, diversity, ethical practice, and critical reflection are all interdependent and must all be considered for the best possible well-being (Smith, 2011). The ideal of systems thinking incorporates multiple perspectives, an interdisciplinary approach, and a sustainable focus.

Sustainability curriculum must be built by considering the three pillars of sustainability: society, economics, and the environment. In addition, permaculture needs to be embedded into sustainability curriculum to promote an ethic that environmental and earth care is vital in human preservation (Praetorius, 2006). The goal of sustainability within education is to build a permanent society that would involve learning how to predict the significances of our actions, foresee a sustainable future, and create the actions needed to achieve the overall mission (IPEC, 2010). Topics such as interdependence of the three pillars, permaculture, and organic living would be continually incorporated within the curriculum. Given that sustainability is itself a learning process, a thirst for lifelong learning is also considered an element of education for sustainability (Blewitt, 2004), and the experience should be holistic and integrative,

considering the major dimensions of time, space, and ethics (Bosselmann, 2001, cited in Sherren, 2005, pp. 97-98).

Sustainability ethics need to be embedded throughout the core curriculum. According to Becker (2011) sustainability ethics need to be inspired by "virtue ethics, ethics of care, and critical theory, and needs to refer to both the specific individual and systemic ethical challenges of sustainability" (p. 2). In addition, Becker addressed the ethical implications of human development in terms of a sustainable environment. If an educator is going to try to teach sustainability, the student must understand why she or he is morally responsible for sustainable efforts. Therefore, a background in transformative learning is also necessary when developing curriculum. As individuals are guided through a transformational experience, learners must be acquainted with the importance of holistic health education, and how one's overall well-being affects sustainability.

The University of Massachusetts Amherst (UMAS) is a leading university in United States sustainability education. In 2002 the sustainability committee put forth a proposal for an introduction to sustainability pilot course, specifically focusing on the development of sustainability curriculum for a major. UMAS proposed the curriculum be based around the quest for sustainability, and should encompass social equity, environmental integrity, and economic vitality. The committee approached curriculum development with a holistic view, and suggested that sustainability should be about integrating paradigms for understanding complex human and non-human systems, including all other views that would give meaning and spirit to the work (Becker et al., 2011).

Specifically, the curriculum took on a multidisciplinary approach and was integrated horizontally across the disciplines. The major framework is comprised of 27 credits of systems thinking and sustainability principles, while major-specific classes combine for 36 sustainability-focused credits. The program also requires a 12 credit hour experiential course, 12 general education requirements, and 33 free choice electives. According to the Creating a Sustainability Curriculum at the University of Massachusetts Amherst document (2002), a sustainability major should include academic courses that revolve around skills (the know how), knowledge (the know what), and wisdom (the know why). Specifically, the UMAS guide suggests using technical skills such as maintenance, farming techniques, and computer skills; administrative skills such as accounting, strategic planning, and advocacy; organizational skills, such as facilitation; supervisory skills, such as community organizing, mediation, grant management and program evaluation; and communication skills such as writing proposals, press release writing, newsletter preparation, public speaking, listening, multiple languages, and interpersonal communication (Becker et al., 2002).

Additionally, UMAS suggests curriculum that supports knowledge expansion in historical and philosophical contexts such as agriculture, sustainable agriculture, culture, and community; agricultural and ecological knowledge in the areas of plant and soil science, food production, ecology, livestock management, community food systems, holistic management, and food quality; and social and economic knowledge in the areas of public policy, legal issues, land trusts, community development, economic development, basic economics, tax policies, and agricultural business management (Becker et al.). Lastly, UMAS encourages building the wisdom behind sustainability into

the curriculum in the areas of personal sustainability (ethics, personal health and nutrition, holistic decision-making, and adult education), cultural awareness (cross cultural awareness, navigation of local politics, how to build a movement, social marketing, process of social change, and social dynamics), and group dynamics (leadership, creativity with youth, problem solving in groups, community-based research, community action, and how to work on a team) (Becker et al.).

The wealth of information revolving around sustainability education is overwhelming. Therefore, it is necessary to address teaching methodologies appropriate for sustainability curriculum as well as adult learning theory and individual learning styles.

The Adult Learner

Traditional classroom education oftentimes does not promote curiosity and desire to self-learn; to create a desire to learn, adults need to experience what they are learning and be able to put theory into practice (Becker et al., 2002). Adult learning theory revolves around experience and should be considered when building sustainability curriculum pedagogy. Whether that experience is derived from student motivation, formally or informally, self-directed, critically reflected upon, or transforms the adult learner's viewpoint, the key to successful adult learning is the ability to personally connect and find value in one's experience. Personal connections are made through one's ability to link new knowledge with prior knowledge, which is a key component of the learning process and sustainable education. Farish (2011) found that in order for sustainability to be successful in higher education, the learner must feel a connection to,

or a reason for practicing sustainability. The adult learner's ability to connect personally to content frequently depends on his or her individual learning styles or preferences.

Learning styles, or preferences, are a biologically and developmentally unavoidable set of individual characteristics that make teaching (and learning) methods effective for some individuals and ineffective for other individuals (Dunn, 1988; Dunn, Beaudry, & Klavas, 1989). Learning styles are heavily researched, and have a variety of explanations making the literature inconclusive. For the purpose of this study, the researcher addresses visual, auditory, and kinesthetic (VAK) as predominant learning styles.

Visual learners are attracted to seeing what they are learning, auditory learners retain the most information from hearing new material, and kinesthetic learners need to have hands-on training (Bloom, 1976). In addition, Felder and Henriques (1995) suggested that a verbal learning style should be incorporated into learning style categorizations. Verbal learners prefer spoken or written explanations, and can usually communicate most effectively through speaking and writing. Many researchers agree that teaching in a variety of ways to please all learning styles is an instructional best practice (Chickering & Gamson, 1987; Kennedy, 2006; Kolb, 1984; Rios, 2010). In addition, teaching to the senses through seeing and hearing, action and rhythm, and cooperation with others also involves best teaching practices (Rios). Ultimately, combining learning styles and sensory teaching creates an enriching experience, which is at the root of all learning. Becker et al. (2002) suggested that learning about sustainability is not enough; sustainability must be experienced.

Researcher and educator David Kolb specifically developed learning styles to include experiences in his experiential learning theory (ELT). Kolb (1984) introduced ELT based on the framework of William James, John Dewey, Kurt Lewin, Carl Rogers, and Paulo Freire's seminal works. Kolb emphasized the importance of experience and learning as a cyclical process derived from one's experience. Although there are presented criticisms, Kolb's model is recognized as a framework for experiential learning and is very practical. Kolb described the learning process as creation of knowledge by the relationship among learning, work, and life activities. The experiential theory works on two levels: a four-stage cycle and learning styles. Kolb focuses on four main stages that the learner must go through in order to make meaning from an experience: two related means of grasping experience—Concrete Experience (CE) and Abstract Conceptualization (AC)—and two related means of transforming experience—Reflective Observation (RO) and Active Experimentation (AE) (Kolb, 1984.) These four parts make up the simplified explanation of the experiential learning process. Research by Farish (2011) supported experiential learning and successful sustainability education. He found that learners need to be engaged in hands-on, insightful experiential learning to truly grasp the importance of sustainability.

Experiential learning is a process of constructing knowledge that involves an innovative tightness among the four learning modes; "this process is portrayed as an idealized learning cycle or spiral where the learner 'touches all the bases'—experiencing, reflecting, thinking, and acting—in a recursive process that is responsive to the learning situation and what is being learned" (Kolb & Kolb, 2009, p. 298). Because all learners acquire knowledge in different ways, Kolb (1984) explained how each mode aligns with

a learning style. The learner's style consists of preferences for both perceiving and processing information. The perceptive learning style is taking in information with a preference for learning through feeling or thinking, and the processing learning style is making sense of the information with a preference for approaching a task through doing or watching (Kolb). Experience is key to learning and experiential learning can be thought of as the core of holistic education.

Holistic education, also known as whole-person learning pedagogy, goes beyond training students' cognitive skills by incorporating multiple levels of learning through critical reflection, team-based learning, and experiential learning (Mabry, 2011). Whole-person learning can be conceptualized as total involvement in the learning process (Hoover, Giambatista, Sorenson, & Bommer, 2010) and it should completely immerse the student in affective, cognitive, and behavioral learning components (Mabry). In sustainability education, an educator should work to create a holistic educational experience to help foster meaningful engagement, which is created by involving students in their learning process (Ellis-Sankari, 2009). Holistic education is introduced through real-world examples, research, and role-playing, and utilizes several methods of active learning, which is a common theme in sustainability education. Centered around connecting cognitive, emotional, and behavior aspects of learning, whole-person learning should aim at fostering personal responsibility for one's own actions, developing practical, knowledgeable skills, and preparing learners in problem-solving skills for everyday, local issues (Mabry).

Moreover, research supports learning connectivity to how emotionally involved an individual feels in their learning. Hoover et al. (2010) suggested that students need to

be behaviorally and emotionally connected to their learning process. Kennedy (2006) found that personal connection to new material can be made from stimulating an individual's emotions, which will lead to motivation and attentiveness. Further, Rios (2010) researched emotional connectivity by teaching to all of the senses and learning styles. Because students learn in a variety of ways, it is important to create lessons that involve the student in what they are learning through their senses, emotions, and by creating vivid experiences. Experiential learning is immersion in what one is learning and can be incorporated into any discipline. Specifically in sustainability education, teaching should focus on more than just content, including the context of what students are learning, so that students can apply course content to the real world (Kendall, Duley, Little, Permau, & Rubrin, 1986). Farish (2011) discovered that teaching sustainability must involve powerful, hands-on experiences that generate a point of reference for students, and provide constant reminders of the importance of sustainability.

Ultimately, in sustainable education a major goal is to create a transformational experience in students so that they will be motivated to be self-directed, life-long learners. Self-directed learning is a key component within sustainable education and promotes transformative learning. Self-directed learning is characterized through adults taking the initiative to learn and discovering how to learn on their own (Merriam, Caffarella, & Baumgartner, 2007). Originally, Knowles (1975) introduced self-directed learning as a process one engages in, without the help of others, to diagnose their learning needs, formulate learning goals, identify resources for learning, select and implement learning strategies, and evaluate learning outcomes. Brookfield (1986) furthered self-directed learning to include an interconnected mix of process and reflection when

forming one's own meaning. Furthermore, self-directed learning is oftentimes grouped into three broad categories: the goals and process of self-directed learning, and the personal characteristics, or learning preferences, of the adult learners (Merriam et al.). Therefore, as sustainable education is directed at adult learners, it is necessary to demonstrate a need for the information, involve students in their learning, and allow for personalization of content. However, because not all students entering higher education have a desire to be sustainable, it is necessary to evoke or unsuspectingly encourage transformative learning in students. By involving students in the learning process, guiding them to find meaning, and facilitating immediate application of material, adult learners will often further their own education, and in a sense, transform. Farish (2011) suggested that educators can transform learners early on by fostering an urgency for sustainable change by teaching ethics of sustainability.

Mezirow (2000) stated that transformative learning takes place when there is a momentous change in one's attitude, beliefs, or perspective, and when, as humans, we can make meaning from our experiences (Schroeder, 2005). The theory originated as "a comprehensive and complex description of how learners construe, validate, and reformulate the meaning of their experience" (Cranton, 1994, p. 22); it focuses on the centrality of one's experience, and expands to include the idea of critical reflection and discussion that gives meaning to the experience. Just as transformational learning is about change that alters one's viewpoint about oneself (Merriam et al., 2007), so is sustainability education. Sustainability is oftentimes not seen as a top priority; therefore, educators must take on the role of believing in its importance, teaching through demonstration, application, and urgency. The NSEE data indicate that sustainability

education should enable students with the ability to apply, integrate, and evaluate an interdisciplinary body of knowledge; acquire skills and values specific to sustainability which may be applied in one's everyday life; involve learners in personal and community-based functions; create attitudes necessary for sustainable living; develop the ability to learn in a self-directed fashion; become responsible citizens of the community by identifying issues of social concern and developing skills for active participation; and develop and use an ethical perspective that supports sustainability (Kendall et al., 1986).

Merriam et al. (2007) suggested that in order for a transformation to occur, one must critically reflect on an experience that alters one's previous mental representation, or meaning, of something. Critical reflection is an imperative part of finding new meaning and the basis of transformational learning. For this reason, it is imperative to also include critical systems thinking and reflection in sustainability curriculum methodology.

If the adult learner finds a purpose, value, and immediacy in application, then the experience may motivate the adult learner to self-directed learning or desire for similar additional experiences (Knowles et al., 2005). Furthermore, in this learning process the adult learner needs to critically reflect on the experience. Internalizing this newly acquired knowledge could lead to a transformation in the learner's beliefs, values, or viewpoints, which may lead to social action (Mezirow, 2000). Ultimately, sustainability education works towards reaching social action. Therefore, sustainability education should promote experiential learning, encourage self-directed learning, and hope for transformative action. Finally, if the learner is able to apply the sustainable practice to new life experiences, then the general education process for sustainability will thrive.

However, getting every student to fully understand and practice sustainability requires a lot of work. Rios (2010) explained that in order to reach all students, educators need to use and value diversity of all kinds, including teaching methods. Specifically, diverse teaching styles are needed for all learning styles.

Teaching Methods

According to Rios (2010) educators need to get involved just as much as the students. Some of the greatest teaching and learning experts described the importance of making "learning an active engagement with the world, not merely the study of second-hand abstractions" (Orr, 2002, p. 2). Oftentimes, sustainability is taught as a stand-alone concern, which is detrimental for evoking a deep emotional connection (Praetorius, 2006). Students need to be exposed to a variety of teaching styles and hands-on experiences to help nurture their learning experience (Rios). Removing students from the classroom and involving them in their learning is an equally important teaching method (Kendall et al., 1986). Frequently, sustainability is taught as a separate entity only emphasized by the written word. "This separated idea of sustainability can leave students with the impression that the environment is something far away that need only be saved for plants and animals; whereas the reality of our environment is that it is the air we breathe, the water we drink, and the neighborhoods in which we live" (Praetorius, p. 6). Therefore, educators need to not only teach of the importance of the environment to the human race, but also involve the students in the interdependence of the environment, the people, and the economy.

According to Cortese (2003), most people view human and species health, societal issues such as politics, the economy, the environment, an increasing population,

and other major issues as separate, competing for attention, and somewhat hierarchical, when in actuality, these issues are all interdependent and systemic. Educators in sustainability must rethink traditional teaching, and integrate instruction, research, operations, and relations with local communities as one system. In addition, sustainability should be taught by demonstration and through experiential learning practices. Orr recommended that teaching sustainability should involve an intense field experience where students and faculty observe and interact with each other and the environment, and practice experiential learning (Kennedy et al., 1986).

Experiential education is considered both teaching and learning methods that are designed to incorporate an applied learning component, which allows students to cultivate knowledge and skills from hands-on, out-of-classroom experiences. Specific examples of experiential education are service learning (community service that utilizes an academic framework), field studies (observation in natural settings), academic internships (application of theory to practice in work settings), cross-cultural education (learning through direct and significant involvement in another culture), and action research (research with practical outcomes on issues identified by a community) (Lattuca & Stark, 2009; NSEE, 2011).

Specific teaching methods for experiential learning involved in sustainability education are service learning, hands-on application, field work, role playing, study abroad or cross-cultural work, and utilizing critical reflection. In addition, Praetorius (2006) suggested teaching sustainability through permaculture principles and gives guidelines for teaching through hands on experiences. Specifically, Praetorius indicated six principles that should be implemented into sustainability education through

experiential learning methods. Principle 1: Work with nature, not against it; Principle 2: Everything is connected and when in balance is self-regulating; Principle 3: Plan for efficiency, use biological resources; Principle 4: Make use of the edge effect; Principle 5: Exert the least amount of effort for the most gain; and Principle 6: Caring for the people.

Program Integration

Sustainability education cannot be a canned or cookie-cutter model. According to Agyeman and Warner (2002), educators should aim for continuous and inclusive dialogue of sustainable practices and applied meanings that are cultural and location specific, as well as informed by politics and conventional ecological knowledge. In sustainability education, it is important to remember the social or human factor within sustainability. Gibson (2006) suggested that in order for sustainability to be completely understood, educators must first work toward clarifying sustainability assessment aims and requirements among administration, the community, and the student population. Initiatives must go beyond the university doors and build through community partnerships. Secondly, Gibson recommended relying on diverse relationships and integrating multiple perspectives in the planning process of a community. Specifically, multiple viewpoints need to be considered in environmental policy and assessment, land-use planning and building, site preservation and restoration, corporate and every day greening, community-level development, and trade options. Finally, sustainability needs to be at the forefront of purpose, decision-making, designs and everyday practices (Gibson).

According to Mabry (2011), when integrating sustainability into education it is important to first define the ideas and relevant objectives to work towards, create

assignments that are hands on, active, and experiential in nature, connect educational goals with sustainable practices, and conclude with final reflective efforts. Mabry suggested that because sustainability is a real-world problem, students must be introduced to problem-based learning where they can link human thinking to action. Therefore, when integrating sustainability into instruction, educators must guide students through theory so they can associate academic skills with life purposes. Finally, when integrating sustainability into academics, Mabry suggested building teams among students and the community. By involving students in the community they become part of the interdependency of the economy, the environment, and the people, which is an important step towards widespread sustainable education.

However, a total transformation of general education will require more than just involving students in the community; it will require support from administration and community leaders. Specifically, the AASHE (2011) recommended several steps for integrating sustainability into higher education curriculum. The AASHE's suggested initiatives for developing and integrating sustainability curriculum in higher education include the following: first developing a better public understanding of sustainability by setting clear, tangible goals and targets, providing leadership opportunities, and sharing resources. Ebong (2002) recommended that the government needs to get involved and that sustainable education should go beyond the doors of higher education institutions. Specifically, governmental agencies and programs should provide educational seminars to healthcare professionals and media spokespersons so that they can educate the general population on programs for a sustainable healthful environment (Ebong). Moreover, by bringing together campus leadership with business community leaders, they can

collaborate on funding initiatives. Together, the community and educators at higher education facilities can educate trustees and regents, while soliciting their support and encouraging joint efforts on grant funding for sustainability education.

Additionally, the AASHE (2011) stated the importance of joining high-impact educational practices throughout the community and through sustainability education, including integrating sustainability concepts into strategic documents and federal policies. An example specifically related to higher education would be to develop language for hiring practices that would attract sustainability faculty and staff, and require sustainable practices. Cortese (2003) exemplified how to transform higher education through faculty and staff support, when he reported on a faculty development program implemented at Northern Arizona University. Specifically, 80 faculty members endured a five-year faculty development program that reworked traditional ideas, ethics, and teaching methodology to create 120 revised courses across the disciplines to put sustainability at the forefront of learning (Cortese). Further, Cortese described how the faculty of Northern Arizona University, "made sustainability a key thrust of the liberal studies requirement for all majors" (p. 20).

The AASHE suggested once an institution is supported by the government and community, and they have sustainable-oriented faculty and staff, the next step should be to recognize sustainability curriculum efforts and combat barriers associated with redeveloping curriculum. When sustainability is considered a high priority and is fully supported by the administration, there are two significant ways the curriculum can be integrated. Sustainability curriculum can be horizontally or vertically implemented into a plan of study. According to Ceulemans and Prins, (2010) horizontal integration

interweaves sustainability design into existing courses; vertical integration concentrates on building separate courses within a program. Further, Lozano (2008) broke down sustainability integration into four categories. First, sustainability design can be approached by adding a small amount about some environmental issues and how to combat those to an existing course. Secondly, sustainability design can be created as a standalone course. Thirdly, sustainability design can be interwoven as a concept connected to traditional disciplinary courses. Lastly, Lozano suggested that sustainability design can be sought out through specializations of each faculty member, thereby, creating a baseline for each course.

Regardless of which aspects of sustainability design are incorporated into the curriculum, an interdisciplinary, horizontal approach is favored (Ceulemans & Prins, 2010), and there must be a large amount of support and effort. Matson (2009) suggested that the sustainability transition requires continual efforts. Cortese (2003) suggested that the only way to completely reorient curriculum is to not only reorient curriculum, but to model sustainability throughout the entire university and community. A research plan, institutional change, administrative support, and great quantities of time are all needed in order to successfully implement sustainability into the core of higher education (AASHE, 2011). Once sustainability is supported and ready for initial design, the *Teacher's Manual and Method for Sustainable Design integration in Curricula* provides a detailed explanation and methodology for educators (Ceulemans & Prins, 2010). The manual is broken into four significant parts including introduction of concepts, relation to education, significance between Corporate Social Responsibility (CSR) and disciplines, and teaching methods and materials associated with integration of CSR.

According to the manual, educators should first be introduced to Sustainability Design (SD) and CSR, and be presented with the overarching question of why sustainability should focus on entrepreneurship (Ceulemans & Prins, 2010). Secondly, educators need to see how SD and CSR fit into education by studying the competencies for SD and CSR. Third, the manual acquaints the reader with the relationship between CSR and disciplines. Specifically, the third part reveals the relationship between CSR and higher education courses and professional education courses. Finally, the manual addresses integrating CSR and SD. The fourth part gives and introduction and overview of teaching methodology, including specific student-activating teaching methods, and materials needed to integrate CSR and SD into higher education and professional education courses (Ceulemans & Prins).

Once educators are familiar with SD and CSR, along with teaching methods and materials for integration, Ceulemans and Prins (2010) suggested the importance of integrating sustainability using the vocabulary and interests of the target audience. This suggestion ties into many researchers best practices for educators. One of the most widely recognized characteristics of adult learning theory is being able to relate new material to students' interests and prior experiences. By fully integrating sustainability into all general education courses, and utilizing experiential education, students should be able to connect to sustainability concepts on a personal level. In addition, students should be faced with the severity of unsustainable practices to help foster self-directed and transformational learning.

Summary

In summary, sustainability is not something that can be achieved by little effort. It is a highly complex topic that requires an understanding of systems thinking and how each individual part is integral to the harmony and balance of sustainability. In addition, there needs to be general knowledge of an all-encompassing definition of sustainability as a holistic approach to self-sufficiency. This approach needs to include a balance of societal, environmental, economic, and healthful needs. Furthermore, one must understand permaculture and means of preserving the land and agriculture for the future. The Permaculture Institute defined permaculture as "an ecological design system for sustainability in all aspects of human endeavor. It teaches us how build natural homes, grow our own food, restore diminished landscapes and ecosystems, catch rainwater, build communities and much more" (permaculture.org, 2011). However, in order to appreciate these complex terms, one must take a step back and understand what is causing the need for this transformative change of higher education institutions.

Human activity is causing detrimental problems that we, as humans, are not realizing until it is too late (Cortese, 2003). Global concerns such as environmental degradation, pollution, negative effects on human health, the concern of a failing American economy, poverty, and commercialization are becoming more popular and are receiving more attention (Taylor, 2012). However, knowledge of sustainability needed by educators to teach the future generations is not there. This deficit is caused by many things. Lidgren (2004) emphasized that due to the multidisciplinary approach to sustainability, the misunderstanding of sustainability, and the general essence that sustainability is not seen as a core issue, incorporating sustainability into higher

education has been a difficult task. A lack of resources, workload units, length of time to see noticeable changes, and the idea of altering the convenience of today's world is causing a delay in sustainability progress (Myers & Beringer, 2010). In addition, teaching sustainability is a difficult task because of the multi-disciplinary approach needed to properly get the importance across and the slow return rate of actions (Ceulemans & Prins, 2010). In order for sustainability components to be incorporated across the disciplines, most educators would need to be re-trained to think of sustainability as a core issue in their field of study, which would be a difficult and time-consuming task.

However, as higher education institutions are at the forefront of innovative ideas and change this is where the change must start. Higher education institutions must take the lead at progressing to sustain the future. In order to move forward, higher education will need to build relationships with the community, reeducate or hire administration, faculty, and staff that are willing to recreate curriculum to include a major focus on sustainability across the disciplines (Junyent & Geli de Ciurana, 2008). In addition, higher education will need to model sustainability on all levels and change traditional teaching methodology to include meaningful experiential and transformative learning (Farish, 2011). Further, program curriculum will need to shift to include a real-world focus that works towards urgent problems; educators will need to lead students through example, and practice service work that involves them in the community (Farish). Plainly, traditional higher education must change on all levels to include real-world practice for students. In order to make these changes, the researcher will investigate best

practices for teaching sustainability, and how to integrate curriculum into traditional general education.

CHAPTER 3

Methodology and Procedures

The methods that were used to explore this study are presented in Chapter 3. This chapter focused on the procedures and measures that directed the research study. Following the introduction, this chapter is divided into the following sections: the purpose of the study, the research questions, review of selected literature, research design methodology, role of the researcher, participants, data collection, and data analysis.

There are noticeable problems in today's changing world. The lack of sustainable practices are contributing to health and environmental issues, a failing economy, peak oil prices, a lack of human efficiency and sufficiency, and many other problems. The problem is exacerbated by the traditional instructional approach of higher education, as many sustainability classes and programs that attempt to educate on sustainability are not reaching the masses. Oftentimes, sustainability classes are not taught through a holistic approach; rather, they are taught as separate entities tacked on to curriculum with a superficial overlay.

Furthermore, another major problem with becoming a more sustainable society is the lack of knowledge and the low interest in learning how to teach sustainable living (Ebong, 2002). Many universities are teaching classes or programs on sustainability; however, these classes and programs are not widespread and are only reaching a very small percentage of people. Therefore, the problem is not just that there are global issues and the lack of knowledge among people, or that sustainability classes and programs are not comprehensive, or widespread; it is the detrimental combination of these issues

(Brandao, 2008; Matson, 2009). As a result, this qualitative study investigated how sustainability expert educators integrate sustainability into general education.

Purpose of the study

The purpose of this study was to describe the process of teaching holistic sustainability in general education. The study explored the need for widespread sustainability, investigate curriculum and teaching methods of successful sustainability programs across the disciplines, and reveal best practices for teaching sustainability in general education. The Grand Tour Question for this research is, *"What is the process of building holistic sustainability curriculum, and how can it be taught across the disciplines in higher education?"* The following research questions guided the study:

1. What is sustainability?
2. Why do we need to practice sustainability?
3. Why is it urgent to incorporate sustainability into to curriculum?
4. What are the reasons for widespread change within higher education?
5. What tasks are required to develop curriculum for successful sustainability courses?
6. What instructional methods are appropriate for incorporating sustainability in multidisciplinary courses?
7. How could sustainability be incorporated into existing general education curriculum?
8. Which elements comprise successful sustainability programs?
9. How do institutions successfully initiate sustainability programs?
10. How do institutions assess the success of sustainability programs?

Review of Selected Literature

Prior to this study the researcher developed a strong interest in sustainability as self-sufficiency. In addition, the researcher visited a sustainable ecovillage where many conversations took place on sustainability. The researcher conducted several searches which included sustainability, permaculture, higher education, curriculum, self-sufficiency, and eco-living, which prompted full exploration of the topic under study. Information was retrieved from *Academic Search Premier, EBSCOhost, Education Resource Information Center, Education Research Complete*, Inter-Library Loan, and *ProQuest Databases* at the I.D. Weeks Library at the University of South Dakota, Vermillion and Hilton M. Briggs Library at South Dakota State University, Brookings. In addition, the researcher utilized the *Publication Manual of the American Psychological Association* for concise rules and style.

Research Design Rationale

Several methods of study are available for academic researchers. The researcher applied a phenomenological design to this study, in the form of qualitative interviews, to learn how to build holistic sustainability curriculum and how to implement it across the discipline within higher education. Groenewald (2004) stated that when researching teaching and learning practices, phenomenology is a suitable research design. In a phenomenological study, the researcher seeks to identify the real meaning of human experiences concerning a phenomenon, as described by participants in a study (Creswell, 2009). According to Moustakas (1994), understanding an experience lived by the participant marks phenomenology as a way of life as well as a method in which to study. Groenewald concluded that in order to study something in its purity, a phenomenological

study should be conducted. Further, a phenomenological study involves thoroughly learning about a complex topic through comprehensive exploration to develop common themes and associations of meaning (Moustakas). Qualitative approaches to research include means of collecting and summarizing narrative responses (Lodico, Spaulding, & Voegtle, 2006). The goal of this study was to explore how successful sustainability educators teach sustainability. The exploratory nature of the study supports Creswell's (2009) explanation of qualitative research. A qualitative approach is one in which the researcher collects open-ended responses with the goal of creating common themes out of complex topics (Bogdan & Biklin, 2007; Creswell, 2009). Further, qualitative research is used to understand complex events or phenomena. According to Bogdan and Biklin (2007), one of the best ways to collect qualitative data is through in-depth interviewing.

In this study, the researcher used qualitative research for education to attempt to understand the phenomenon of teaching holistic sustainability within higher education. The researcher expected to conduct interviews with six to eight experts in sustainability curriculum to gain a better understanding of how to integrate and successfully teach sustainability curriculum.

The Interview Design

According to Bogdan and Biklen (2007), "an interview is a purposeful conversation" that aims at obtaining information that is, "used to gather descriptive data in the subjects' own words so that the researcher can develop insights on how subjects interpret some piece of the world" (p. 103). According to Turner (2010), interviews provide in-depth information pertaining to participants' experiences and viewpoints of a particular topic. There are three types of qualitative interview design, including informal

conversational interviews, general interview guided approach, and standardized open-ended interviews (Turner). The researcher planed to interview international experts in sustainability education to gain a better understanding of best practices for teaching sustainability. Because standardized open-ended interviews are structured and allow participants to answer freely with as much detail as they find necessary (Turner), the best possible method of interviewing for this study was standardized open-ended interviews.

Interview design consists of an in-depth exploration of the research questions. According to Marshall and Rossman (2010), research questions permit exploration of a topic, but also work to delimit the study. Research questions are designed to investigate complex topics while maintaining the focus of the study (Bogdan & Biklen, 2007) Further, Corbin and Strauss (2008) explained that the purpose of a research question in a qualitative study is to identify the topic area to be studied and to guide the reader to find the importance of that topic.

Role of the Researcher

When researchers collect qualitative data, they must take on a role to try to understand the phenomenon from the informants' own viewpoints (Bogdan & Biklen, 2007). The researcher can attempt to understand the informants' perspectives in multiple ways. Bogdan and Biklen suggested that the best methods of data collection for obtaining rich and meaty data are participant observation and in-depth interviewing. Due to the broad scope of obtaining information internationally, the researcher will not be able to serve as a participant observer. Therefore, in this study, the researcher will assume the role of an in-depth interviewer.

The researcher's interest in investigating sustainability teaching and learning methods comes from an internal desire to make things better. Growing up the researcher was always taught the importance of saving and reusing, human and environmental health, community, and economics. These values were instilled in the researcher, and became a big part of her life; therefore, creating a desire to learn more about each component. A trip to a Brazilian EcoVillage, and a family member's health problems only made the sustainability passion strengthen. As a result, the researcher wants to learn the most effective ways of building a sustainability program, as well as teaching and learning methods associated with successful sustainability programs.

Participants

The participants for this study consisted of sustainability experts from different parts of the world. For the purpose of this study a sustainability expert is defined as someone who owns or operates a sustainable village and teaches a successful sustainability program. A successful program is described as one that has consistently produced certificate-bearing graduates in sustainable design or permaculture design. The researcher narrowed the participants to include experts from dissimilar countries to gain a more comprehensive understanding of sustainability programs. Once approved, the researcher contacted the anticipated individuals and requested their participation in this qualitative study via email. Participants were from Brazil, Turkey, and the United States. The participants involved in the research project were those individuals who graciously agreed to be interviewed and who are authoritative, teaching experts within their respected sustainability programs. Specifically, the researcher invited two sustainability experts that own and operate a sustainable ecovillage near Piranapolis, Brazil, two

sustainability program directors from the University of Massachusetts Amherst, (one who works in Mexico), and two sustainability experts from Anchora, Turkey.

Data Collection

The interviews were conducted over the internet through email due to the international distance and to promote less paper use. Also, the email format allows participants as much time as needed to provide comprehensive responses in their own words. Interview questions were designed to gain insight on successful measures needed to develop, initiate, maintain, and assess a sustainability program. The interview questions (see Appendix A) were geared toward specific curriculum and instructional methods in order to build a sustainability program from the ground up. The researcher anticipated that the interview questionnaires would be sent out in February, 2012. The interviews were structured and guide the participant to provide in-depth responses. The interview questions were reviewed by the researcher's committee, as well as two local sustainability experts.

The researcher emailed an informed consent form (see Appendix B) along with the interview questions. The interview guide was structured the same for each participant. Once the interviews were completed, the researcher read through and categorized the participants' responses. In addition to interview responses, the researcher reviewed public documents made available through the sustainability sites of each participant. The researcher followed up with each of the participants reminding them to complete and return the interview guide. The researcher received participant responses through March of 2012.

Data Analysis/ Explicitation of the Data

The interviewees and the public documents served as the primary unit of analysis (Bless & Higson, 2000); each interview question response was one unit of data. According to Groenewald (2004), data analysis is not regarded highly in a phenomenological study. Instead, Groenewald suggested using explicitation of the data, because Hycer (1999) cautioned that "analysis usually means a breaking into parts and therefore often means a loss of the whole phenomenon…whereas explicitation implies an investigation of the constituents of a phenomenon" (p. 161). Therefore, the explicitation of data will be in two forms. First, participants' demographic characteristics, such as sex, age, nationality, etc. were described in narrative form. Secondly, qualitative data was analyzed through a thematic analysis.

According to Howitt and Cramer (2011), a thematic analysis requires the researcher to identify themes that appear in the data. The themes need to adequately describe the data as a whole and the researcher needs to illustrate through example how how each theme relates to the data (Howitt & Cramer). Specifically, the printed copies of each interview transcript. The researcher read through and organized each participants' responses with the corresponding interview question. The researcher annotated the transcripts, while looking for possible themes. The researcher reread the data and noted any additional phrases or ideas that were represented by the participants. In addition, the researcher highlighted common ideas in the same color. According to Groenewald (2004), the researcher must try to gain the meaning of each interview question response within its holistic context by clustering units of meaning to form themes (Hycner, 1999).

The researcher reread through participant responses and worked to group responses into similar meanings (Groenewald, 2004). Once similar meanings were assigned, the researcher looked for emergent themes within participant responses. According to Hycner (1985) the researcher should attempt to interpret the data and synthesize responses based on the original research questions. When the data analysis was complete, the researcher requested participants to confirm the interpretation of their responses. Hycner (1999) suggested that researchers should summarize each interview, validate the clustered meanings with the interviewee, and make any modifications that are necessary. Lastly, the interviewer should work to cluster all interview responses into general themes that support the research that is being conducted (Groenewald, 2004). Specifically, Hycner (1985) suggested determining themes from clusters of meaning, which is when "the researcher interrogates all the clusters of meaning to determine if there is one or more central themes which expresses the essence of these clusters (p. 290).

Ethical Consideration

Permission to conduct this study was requested of the University of South Dakota's Institutional Review Board (IRB). Due to the interview design, the researcher was aquatinted with each of the participants. Therefore, pseudonyms will be used to protect the identify of the participants.

Summary

In short, the researcher anticipated collecting data through six to eight in-depth interviews by email. Participants were selected from varying parts of the world in order to gain a better understanding of sustainability education in different climates and diverse materials. The participants' responses were used to formulate an understanding of how to

integrate sustainability curriculum into general education. In addition, public forms such as syllabi and curriculum documents were analyzed to determine commonalities of successful sustainability programs from across the world. Chapter 4 of this study presents the findings from the interviews and results of the data analysis.

CHAPTER 4

Findings and Analysis

Chapter 4 communicates the findings and analysis for this phenomenological study. The data collection portion of this qualitative study included online interviews (see Appendix A) and supplemental public documents such as syllabi, lesson plans, and course projects. Interviews were conducted with six participants from different parts of the world in order to understand sustainability on a director's level and to investigate effective methods of incorporating sustainability into traditional general education requirements. The purpose of this study was to use in-depth interviews to investigate how educators can implement sustainability into general education. Although the researcher hoped to report specific 'how to' findings, the incorporation of sustainability is more complex than a few exact steps. Most interview participants, although supportive of the idea of integrating sustainability into general education, seemed doubtful of its overall progress. To protect the identity of the interview participants, pseudonyms were used.

Participant one, Ted, is the director of an ecovillage in a South American country. He has been involved with sustainability for nearly 15 years, and teaches students how to live sustainably. Participant two, Reagan, is the director of an educational nonprofit sustainability program in North America. He has been involved with sustainability for 20 years, and runs a sustainability program that partners with study abroad programs based in sustainable communities around the world. Participant three, Delores, is a researcher and teacher of sustainability in an Eurasian country. She has been involved with sustainability for nearly 15 years, and runs projects and training sessions with students on

a daily basis. Participant four, Lois, is a director and teacher of sustainability in a South American country. She has been involved with sustainability for nearly 15 years and teaches students the ethics of sustainability, as well as experiential, sustainability living. Participant five, Arnold, is a professor and researcher of sustainability programs. He leads students in sustainability site learning in an Eurasian country. Participant six, Collin, is an independent sustainability educator for a nonprofit organization in the Midwest. He has been involved in sustainability education for approximately five years, but has practiced efforts of sustainability for decades.

The participants were purposefully selected for their prestigious work within the field of sustainability. Each participant directly works with or runs a sustainability program. Their responses to the interview questions have been used to address the grand tour question and following supportive research questions. For the development of the results, the researcher addressed the 11 subsequent research questions first, in order to cultivate a comprehensive response to the grand tour question. The Grand Tour Question for this research was, *"What is the process of building holistic sustainability curriculum, and how can it be taught across the disciplines in higher education?"* Interview participant responses have been synthesized to address

1. What is sustainability?
2. Why do we need to practice sustainability?
3. Why is it urgent to incorporate sustainability into curriculum?
4. What are the reasons for widespread change within higher education?
5. What tasks are required to develop curriculum for successful sustainability courses?

6. What instructional methods are appropriate for incorporating sustainability in multidisciplinary courses?
7. How could sustainability be incorporated into existing general education curriculum?
8. Which elements comprise successful sustainability programs?
9. How do institutions successfully initiate sustainability programs?
10. How do institutions assess the success of sustainability programs?
11. How do institutions successfully maintain sustainability programs?

Findings in this chapter are organized into five sections that address the above research questions. Section one, Sustainability Defined: The Need and Urgency, addresses RQ 1, RQ 2, and RQ 3. Section two, Change within Higher Education, answers RQ 4. Section three, Developing Curriculum and Integration, responds to RQ 5. Section four, Teaching Methodology: The Educator, Materials, and Location, attempts to address the complex needs of RQ 6, RQ 7, and RQ 8. And lastly section five, Sustainability Program Success: Initiation, Assessment, and Maintenance, addresses RQ 9, RQ 10, and RQ 11.

Sustainability Defined: The Need and Urgency

The first section addresses the understanding of sustainability from experts of sustainability perspectives, as well as the overall need for practicing sustainability. Participants agreed that sustainability has many definitions, but overall, sustainability is a way of life. To be sustainable, or to live sustainably, requires a balance of efforts that prevent the overuse of resources, as well as to live within systems that are harmonious, self-supporting and non-damaging. Specifically, Ted shared that he believes,

"sustainability is living within systems. A sustainable system is one that, during its lifetime produces or store more energy than was necessary for its development and maintenance. In short, it is all energy exchanges that must balance out in a given time." Reagan defined sustainability as, "For me, sustainability is about living well and lightly together. How we can live within the Earth's carrying capacity while also providing universal access to adequate wealth and resources." Collin defined sustainability as the ability to provide for the needs of the present without jeopardizing the needs of the future generations.

Arnold's definition, although similar, emphasized that, "sustainability is something that does not feed on itself to the point where it collapses, and does not collapse when its innovators or authorities change." Delores simplified the definition into, "sustainability is self-supporting and non-damaging." And lastly, Lois indicated that sustainability is a way of life where we do not overuse our resources; we work with the nature and together as a community. She stated,

> Sustainability is the ability to sustain life on earth. A sustainable system is one that during its time accumulates more energy than the one that is necessary to establish it or maintain it. Specifically, the system in which we live must satisfy our needs for growth and maintenance by storing more energy than spent to build it. This means that our focus should be on getting what we need in the present without compromising the structure so that future generations can do the same.

Noticeably, to practice a sustainable life requires one to live and be interdependent with one another. Although participants learned about sustainability in a variety of ways, all referred to experiential learning as the primary method, in which they

came to understand sustainability as a way of life. Because sustainability needs to be a way of life, all participants concluded that we must learn firsthand the importance and need for sustainability. Each participant referred to the urgency level of sustainability to be "very high" or "beyond urgent." Participants noted that it is critical that we practice sustainability to continue to exist so we do not destroy all of our resources. To exemplify, Regan stated, "As a species, we exceeded the planet's carrying capacity. It may be too late to stop the planet warming at least 2.5 degrees, so it's a matter of limiting further damage… we are beyond urgent and the time to act was really yesterday, but since that didn't happen, it is certainly NOW!" Ted concluded that "sustainability is the most urgent thing we can contribute to in an individual level. We will have to change or else the future will change us without warning." Lois predicted that the urgency level lies in the education of our young people; if we educate kids the same way we were educated, nothing will change. We must communicate the urgency of saving the future." Collin added that the urgency level is detrimentally high because "we are approaching a crisis stage. "Delores exclaimed that the urgency level of sustainability is "very urgent! Unsustainable practices threaten the future of our planet and of human kind." Arnold indicated that he believes the general population believes the urgency level is low, but in reality, it is very high. In his opinion, there are three reasons we need to take action soon: (1) Global warming is something we have to adapt to because it clearly is not reversible given the growth of China and India. (2) Alleviation of poverty, improvement of the quality of life in urban slums (e.g. Cairo), ending child labour* and many other concerns are of great importance. These will require more rather than less energy, necessitate the

production of more not less food, and all of other uses of resources. (3) Resolution and prevention of conflict is the greater global challenge.

All participants stated that the urgency level of sustainable practices should be very high because the future of our planet and our existence is threatened by human activity. Collin expanded on the idea that "we are approaching a crisis stage; climate change is unabated, weather extremes are being ignored, and little effort seems to be made to shift to more renewable resources." In addition, when addressing the research question, "Why is it urgent to incorporate sustainability into curriculum?" participants revealed a need for sustainability to be incorporated into general curriculum because that is where the mass student population is going. Lois foreshadowed that education is the core of sustainability. She said, "many people, even educators are not aware of how to explain what it is to be sustainable. Educating through reference centers (ecocentre*) gives the experience that individuals need to take home with them;" therefore, making it necessary to educate as many people at one time as possible. Specifically, Reagan stated, "students interested in sustainability are more likely to pursue sustainability-related opportunities than the general population." Therefore, it is necessary to integrate sustainability into general education.

Change within Higher Education

According to interview responses, the need for change within higher education is blatantly evident; there is a strong need for change, but it will be difficult to implement. Reagan Stated, "Academia is inherently competitive, hierarchical, fragmented, theoretical and problem-oriented—all of which is antithetical to really teaching about sustainability." Whereas Ted stated,

> It is difficult to say how higher education could accommodate sustainability because the general education system was not designed to teach sustainability. In fact, quiet opposite. It was designed to teach conformity and consumption. Teaching sustainability means critical minds and minimal consumption. It is not about providing workers for the labor market. It is about teaching for earth citizenship, not patriotism. It is about problem solving with ethics in mind, not competition. I think the whole education system is doomed to fail.

Additionally, Collin suggested that incorporating sustainability into higher education will need to be pervasive throughout the system. A piecemeal approach, which is all too common in higher education, will not be successful." Lois responded by stating, "I think academia needs to make sustainability a core focus throughout its curriculum and operations; we must re-educate teachers and focus on a new curriculum." Further, Arnold pointed out that

> a general education, basic, one-semester course on sustainability could be a good start; however, resistance from entrenched interests who seek to maintain the status quo will make this a big challenge. General education requirements are often reduced at universities seeking to make space for major requirements that keep expanding. My best advice would be to set up a new institution because existing institutions are difficult to change.

As participants pointed out to incorporate sustainability into general education will require some dramatic changes. Explicitly, Reagan transitions the need for change into the tasks that are required to develop curriculum for successful sustainability courses by

stating, “AASHE shows many examples of how this (change within higher education) can happen.”

AASHE (2011) provides research studies, syllabus samples, course descriptions, and projects to promote how to incorporate sustainability into general education. However, incorporating sustainability into traditional education is going to take more than a sample syllabus. According to participants this widespread change is going to require a transformational shift of more than just curriculum; it will require a reformation of perspectives and behaviors, especially within administration. Ted recognized that the change will not only require a, “radical restructuring of lifestyles” but also, “recognizing the importance of non-schooling education.” Further, Delores stated that widespread change will require, “Persuading authorities to be actively involved. Right now, there is a lack of commitment to sustainability when governments and local authorities establish rules and regulations. Politics are ruled by what will attract the most votes, and this includes the politics within higher education.” Ted also stated that, “the bureaucrats and power brokers of the educational system are controlling higher education. There are only a few people that benefit from their affairs. They control the changes…to make such a vertical system horizontal could prove to be a superhuman task.” Lois added, “transformation of current curriculum to include sustainability needs to start in the educational department. We will need to see policy enforcement, professional development courses for teachers, media support, individual interest, and non-profits supporting schools.”

Drawing from the interviews, it appears that a wealth of knowledge of sustainability among the public, students, faculty, staff, and administration is needed for

an overhaul of general education. This process will require understanding, acceptance, buy-in of sustainability, and ultimately a refocus of the educational ministry. The researcher concluded from participant responses that change must start with education, and education must start with students and educators. Ted stated that sustainability education must start, "on the streets." He encouraged that sustainability must be implemented through educating the public, and we all must be a part of the reformation. Similarly, Reagan stated that we must "wake-up students to the need for change and inspire them to be a part of the process." Delores concluded that "all levels of society" must be involved in the process for implementing a widespread change in education. "It must start with authorities and perhaps non-governmental organizations supported by local authorities." Likewise, Arnold stated that education reformation "must start with government support," and be followed with a "traveling exhibition of dedicated educators that go from school to school, probably aimed at 8-12 year olds." Lastly, Collin stated that, "at a university it must start with the president and senior administrators. Not a likely scenario in some places."

Participants in this study indicated that the process will be difficult and will take a long time, maybe even several generations to implement. Specifically, when participants were asked how long they thought it would take to implement change, responses included, "too long," "multiple generations," "years," and "a full physiological human cycle of living in a sustainable place."

Developing Curriculum and Integration

Despite the bleak outlook of an immediate change, participants had a plethora of ideas of what should be included in the 'new' outlook of education. Suggestions

included educators from across the disciplines, sustainable arts, an emphasis on the pillars of sustainability, living in community, permaculture design, soil and seed heritage, energy efficiency, sustainable building designs, on-site learning, hands on approaches, a balance of human and earth, bioregional economics, renewable resources, decreasing waste and consumption, recycling, the effects of overpopulation, political and economic stability, and community organization and activism.

Specifically, Reagan encouraged that a community approach and an expansion of the pillars of sustainability are needed to develop curriculum. "There are fundamental areas that need to be addressed within sustainability courses and those are relationships with each other (community), the planet (ecology), and ourselves (spirit and worldview). Service is also necessary in a sustainability program. It gives students the opportunity to practice what we are learning and to give back to our host sites. Sustainable economics is also important." Arnold suggested that sustainability curriculum will "vary hugely from subject to subject. I do not think sustainability is a subject on its own, it is a component of many or most other subjects with obvious differences of emphasis or content." For example, "architects and city planners need different knowledge sets to those of political scientists, economists and administrative scientists." Further, Arnold stated, "Green and eco-architecture has become a standard academic area in my university, whereas political scientists (correctly) do not see votes in green policies. It is a part of a great need for increased awareness of the environment."

Delores's approach to building a sustainability-focused curriculum was more general, as she stated that sustainability curriculum should be focused on, "energy efficiency in our built environment, recycling and decreasing waste, and promotion of

renewable energy. A general education requirement should include topics pertaining to sustainability as a whole; criteria should ensure that principles for a sustainable future become a daily concern." Ted suggested that sustainability curriculum should include, "permaculture design, transition towns, bioregional economics, sustainable arts, and community organization and activism." Collin emphasized the importance of, "ecology, botany, ecological economics, earth science, and history." Lastly, Lois explained that sustainability curriculum should be "all-encompassing." She shared that her curriculum is comprised of, " water care, species and ecosystem, food security, technology and renewable energy, local economy, communication and culture."

In addition to interview responses, the researcher accessed public websites and documents from each of the participants' place of employment, and compiled a list of sustainability curriculum components based on the documents available on the public websites, as well as a table of objectives related to the program mission statement. To protect the identity of each participant, their respective places of employment have been labeled as location 1, 2 and 3.

Location One: The purpose of location one is to promote sustainability through environmental studies. It pursues the objectives highlighted in Table 1.

Table 1

Objectives from Location 1

Objective	Objective Description
One:	To advocate the use of renewable sources of energy;
Two:	To act as a stimulus and a catalyst for environment-friendly building with appropriate materials and energy efficient designs;
Three:	To act as a dynamic experimental base for testing designs, materials and activities suitable for viable and sustainable village life.
Four:	To encourage village development and income generating activities that might halt and even reverse migration from rural areas to the cities.

Location Two: The purpose of location two is to establish appropriate solutions to the problems in society, promote the viability of a sustainable culture, opportunities to expand educational experiences and disseminate models in this country. The objectives pursued in location two are summarized in Table 2.

Table 2

Objectives from Location 2

Objective	Objective Description
One:	To promote true values and provide practical educational experiences.
Two:	To implement an infrastructure for a sustainable studies school and develop appropriate technologies and solutions to the current reality.
Three:	To provide service to rural areas within the country and to cooperate internationally with other organizations.
Four:	To maintain ecological housing, responsible sanitation strategies, renewable energy, food security, reusable water and care for the process of sustainability education.

Location Three: The mission of location three is to create opportunities to live and learn within human-scale communities that are consciously striving to live well and lightly. By offering positive visions and stories for humanity and the planet, ecovillages offer ideal campuses for students to explore possible futures, both in the world in their own lives. Table 3 summarizes the objectives from location three.

Table 3

Objectives from Location 3

Objective	Objective Description
One:	To introduce students to climate change and peak oil to respond to global issues
Two:	To demonstrate the importance for a systemic change and reducing our ecological footprint
Three:	To provide students with an ideal ecovillage campus which will provide focus on renewable energy systems, ecological design, organic farming, holistic health and nutrition, consensus decision making, and mindfulness practices such as yoga and meditation.

The three locations have a plethora of curriculum topics which have been compiled into Table 4.

Table 4

Curriculum by Location

Location	List of Curriculum
Location One:	Environmental studies, renewable energy sources, appropriate technologies, sustainable architecture, interrelationships, human development, social and economic status/class, climate change, domestication of plants and animals, human colonization, energy efficiency, recycling, decreasing waste, papercrete, gardening, solar energy, hydrology and water management, permaculture, and energy efficient greenhouses.
Location Two:	Permaculture design, natural and biobuilding, science and the environment for young people, ecovillage living, environmental and international experience, climate change, sustainable agriculture, community based living, renewable energy, urban permaculture, water solutions, family agriculture, natural resources conservation, creating a sustainable habitat, solutions for city building, and construction of an ecovillage
Location Three:	Social justice, conflict resolution, permaculture design, community engagement, environmental conservation, sustainable development, international and national trends and policies, language study, cultural immersion, service learning, investigation of the social, environmental cultural and personal dimensions of sustainability, ecological relationships, community service learning theory and practice, group dynamics, global and local sustainable living, applications and practices of sustainable living, body, mind and spirit: cultivating personal sustainability, peace and social justice, plant and soil sciences, sustainable design and construction, leadership for social change, organic gardening, basics of selection, establishment, and maintenance of orchards, ecological pest management, free range poultry systems, cell grazing for cattle and sheep, ecology, community, and indigenous spirituality in the high Amazon, and community health.

It is evident that each location provides ample opportunity for students to learn sustainable practices. Each location offers their own unique course list, but teaching

methodology in which these classes are presented is implemented in similar ways. The following section references participant responses to teaching methodology.

Teaching Methodology: The Educator, Materials, and Location

In addition to curriculum ideas, participants were enthused to report effective teaching practices for sustainability. Participants reported approaches of integration and teaching methodologies, as well as descriptions of 'learning sties' that should be used to appropriately teach sustainability. Overall, participants overwhelmingly supported experiential learning and hands-on practice at a site-based, authentic location. Collin offered that a mixture of classroom work and hands on work would be most effective for teaching sustainability, and that a "hands-on demonstration center with classroom space would be an ideal teaching site." Reagan summarized his thoughts by stating, "Our curriculum is great, but really it is all about framing and scaffolding students' direct experiences within sustainable communities. Of course we also employ methodologies such as seminaring, authentic assessment, critical reflection, and service learning in our programs." Specifically, when asked what teaching methodology is most effective for teaching sustainability, Reagan stated, "immersion within communities modeling sustainable lifestyles; any community that is striving to live well and lightly together" would make an ideal site for teaching sustainability.

Immersion and experiential learning was echoed by both Lois and Ted, respectively, as responses included, "Students must learn through example, on-site, and hands on; we must encourage an exchange of ethics and learning new skills, technologies, etc." and "A whole live-in center so that people can immerse themselves in the idea…as for a teaching methodology, the only one that works; the example." Ted

expanded to include a full description of an ideal teaching site for sustainability, "A fully featured sustainable centre*, where people can inhabit natural buildings, drink clean, safe rainwater, eat organic, local food, recycle their wastes, and see how it's all done, experiment and build sustainable technologies and practice meaningful work in the service of others."

Similarly, Delores stated that "hands on approaches are usually most effective for teaching sustainability, and field trips to modern factories, a mechanized farm, a power plant, and an ecocentre are needed to teach sustainability" According to Arnold, effective teaching methods vary for teaching sustainability. For example, he stated, "it depends on the subject. In architecture it would be obvious that in design courses" would be most effective for teaching sustainability." Arnold continued to explain that "examples of existing approaches, activities and projects, suggestions for organized actions, and suggestions for an ideal way of life must be available for an ideal teaching site."

Overall, participants revealed that a traditional general education requirement, teacher, and educational site would have to change dramatically. Lois concluded that the best way to teach sustainability is through a "reference centre* that aids in the teaching of sustainability through their senses. Students must be able to get their hands dirty, feel the soil, prepare food, share, and celebrate together. If the experience of sustainability gives a sense of abundance this encourages people to make changes. If sustainability is taught within the four walls of a school, the challenge is greater. Reagan stated that in order to make a successful sustainability program, "you wouldn't even be able to see it (sustainability) is there, because it would be infused throughout the system in the

curriculum, the location, and operations of the school. This theme was echoed by Arnold as he stated, "sustainability should be integrated at all levels; there should not be a starting and stopping point." Participants continued by stating that integrating sustainability into general education would require a 'certain-type of instructor."

Specifically, participants included that the teacher must be involved, passionate, persuasive, a leader, and ethical. According to Ted, the kind of person needed to teach sustainability is "The one that is conscious of the need to lead through example." Arnold responded that, "The kind of person needed to teach sustainability is someone that is a role-model for ambitious career-mined students, i.e. can educate and influence those will be the policy makers in the future. If it is left to the 'non-technical' elective it will be as useless as the making of marbled paper." Arnold continued to explain that a good educator speaks to the real world, and employs all levels of sustainability. Delores simplified this explanation by stating, "A sustainability educator is anyone who believes in it, and values its importance." Lois concluded that the sustainability educator needs "to be creative, innovative, able to solve problems, action based, and a person strong in the ethics of sustainability." Collin added that "someone with experience, both academic and practical" would be needed to teach sustainability. Lastly, Reagan determined that "I think a sustainability educator needs to be interested in bridging and linking disciplines with a kind of "lateral rigor." At least for our programs, they also need to be skilled in building and maintaining "learning communities" of students and faculty." Further, Reagan expanded on the idea of a sustainability educator in his own personal blog that states he would hire an educator to teach sustainability that is, "experimental, heterarchical, cooperative, transdiciplinary, and intimate." In addition to describing the

ideal candidate for teaching sustainability, Reagan stated that the faculty and staff are what comprise a successful sustainability program.

In addition to the interview responses, the researcher accessed the participants' program websites to compile a comprehensive table of methods of instruction, as well as learner activities. Table 5 represents a comprehensive list of methods in which these courses are presented.

Table 5

Methodology and Learner Activities

Combined Locations	Methods and Learner Activities
Locations One, Two, and Three	Experiential learning, hands-on practice, study abroad, service learning, role-playing, modeling, critical reflection, living laboratories, meaning making, transdisciplinary, learner centered, workshops, small class size, orientation and training, individualized learning plans, internships, field visits, one on one faculty meetings, self and faculty evaluations, dialogue with experts, ask and reflect, lead by example, critical thinking and reading, written essays and research papers, authentic assessment, participate and lead seminars, build groups process and facilitation of skills, service learning, internships, independent studies, participate in host country cultures, experience the daily patterns of community life, develop an in-depth understanding of local issues and their global context, develop the practice of effective and sustainable action, and learn effective models of conflict resolution.

Sustainability Program Success: Initiation, Assessment, and Maintenance

According to the research participants for this study, sustainability program initiation within higher education is dependent on many factors including, but not limited to, administration, society, students, faculty, and general courses of sustainability. Overall, participants had ideas of program initiation, but it was not hopeful. Reagan

stated that he has, in fact, tried to go the direct opposite direction. "My focus has been trying to incorporate higher education into the sustainability movement. I honestly think higher education is going to go through some rocky times in their transition to a post-oil world as they will need to shift structures that have been in place since the middle ages." Collin suggested building a new site. "A traditional institution will not work. I am not sanguine about the effectiveness of teaching sustainability at universities in the US because it is an overarching concept and life philosophy and seems to run counter to how many Americans see their lifestyle."

Additionally, when asked "what ideas do you have for initiating a sustainability program into higher education," Delores stated, "It is crucial that the university administration and indeed senate are supportive. At the moment the only way to achieve support is through raising the academic status of the university in global rankings. Approaching the top flight private universities, set up by hugely successful and innovate entrepreneurs is clearly a way forward." Austerely, Ted added that initiation must be driven by a primary source, and concluded that there must be a growing rise in awareness of the environment, but unfortunately, that awareness will probably be driven by "economics, drought and food shortages."

Additional responses from participants included, "it won't happen in widespread higher education institutions, we will have to depend on independent communities to develop ecocenters," "it will be an extremely challenging task; one that will most-likely require a catastrophic event," and more positively one participant stated that, "if you can get the administration, students, and faculty onboard, then you may have a chance at

integrating sustainability into higher education with general courses that have a predominate focus on sustainability at all levels and disciplines."

Despite the dismal outlook on integrating sustainability into traditional higher education, participants did have insightful assessment measures and ways in which to gage their own program success. All participants concluded that the best way to measure success within their program was through student response. In addition, Collin offered that, to measure "the change in attitudes among students" is the best way to evaluate your program. Delores stated that they ensure program success through proper implementation of hands-on activities and student implementation of the taught approaches. Further, Delores stated that they evaluate their program by individual responses from each student. In the same way, Reagan's program also elicits student response for program evaluation. Specifically, he stated that,

> Students on our programs create individualized learning plans, which include criteria for how they will assess their own success on our programs. Along with their portfolio of work, these criteria are used along with faculty criteria for evaluation. Students also complete extensive program evaluations and also pre, post, 6-month post, and two year post surveys that assess their beliefs and behaviors.

He continued to explain that post surveys ask students to reflect on what they learned, valued, and plan to do with the information gained from their experience. Additionally, Reagan stated that, "inspiring and knowledgeable faculty/staff; motivated and mature students; an environment that models that which we are trying to teach all contribute to a successful sustainability program."

Arnold works in a more traditional aspect for assessment and ensuring program success. He stated that he evaluates, "mostly through term papers, with exams as a check that students have done those papers themselves" and ensures program success by finding students with "high levels of interest, close ties to the real world, practical examples that demonstrate how individuals and small groups can make a real difference." Collin offered that "committed people: staff, faculty, and most especially committed students contribute to program success. Other participant responses included both traditional and nontraditional means of assessment. Ted detailed that he didn't believe in formal assessment, and much preferred to "see the results from students." He explained that they include student testimony into a daily ritual at their ecocenter. Likewise, Lois had similar views. She said she did not like to get caught up in the assessment side of things because, "it is obvious when a student "gets it." I do my own kind of assessment by seeing how students apply what I am teaching." Overall, the participants had some differing views on program integration and assessment, but agreed that student application is the most effective way of 'seeing' the results and successful maintenance of their programs. In addition, participants indicated that continued student correspondence and new student interest in their programs were ways in which they measured the on-going success of their programs.

Education

The presentation of interview responses addressing each sub-research question sets up the foundation for the overall grand tour question, *"What is the process of building holistic sustainability curriculum, and how can it be taught across the disciplines in higher education?"* As one might expect this question cannot be answered

in one simplistic response. However, the majority of information can be synthesized into education. Educating society, students, teachers, staff, and administration is key in building a holistic sustainability curriculum, and ultimately integration across the disciplines. Currently, it seems from the reviewed literature, as well as the interview participants, the public is not aware of the immediate need of practicing sustainability as a way of life. The first step in any process is awareness and education. Once sustainability zealots build awareness and educate the public, curriculum development and integration can happen. As the research participants clearly point out, sustainability curriculum cannot be solely integrated in one area, it must be widespread and interwoven into not only each course at a university, but also the mechanisms which run the higher education institution. Each participant clearly stated their preference in seeing sustainability embedded into not only general education, but at all levels. Research participant Ted indicated that once the needed changes occur, "you wouldn't be able to even see it (sustainability) is there because it would be infused throughout the system in both the curriculum and operations of the school."

Overall, these interview data depict the phenomenology of integrating sustainability into higher education, but throughout the study, several specific themes emerged from these data. The next section in the findings explains seven major themes that appeared from the study including: 1) Spontaneity, or flexibility, in sustainability, 2) The Three R's of sustainability are good, but not enough, 3) Difficulty of integrating sustainability into traditional higher education, 4) Education is needed at all levels, 5) Sustainability is a way of life, 6) Experiential learning is needed for sustainability, and 7.) Hope.

Spontaneity. Specifically, participants revealed a general theme that sustainability is full of spontaneity, and flexibility, and that there is no such thing as a typical day for those directing sustainability programs, and everything changes. The researcher found that spontaneity is characteristic of sustainability, in the sense that there is not necessarily a typical day for a director of sustainability, and one must be flexible. Specifically, Lois stated that, "One must be flexible and realize that sustainability is more than doing a few acts of green such as recycling, reusing and reducing, it is a way of life. The days revolve around building community, maintaining the property, and catching up on business-related items." In addition, Reagan laughed when the researcher asked to explain a typical day. "Hah! It varies a lot, but in a typical week when I am not traveling, I have various meetings with staff and other stakeholders and a lot of communicating via phone and email and often presentations in a college setting. I often travel to other campuses and occasionally to our program sites." Ted similarly exclaimed, "There is no typical day in an ecocentre. Most days there are a few tasks: I leave home and walk around the ecocentre to see and talk with each staff about their daily chores. Reorganize their daily plans if necessary. Go to our administrative building and check for contact activity and financial tasks. At some point during the day there are also others tasks: Back to the field checking and helping with latest projects, construction, gardening, etc. Into my office to check for emails and write up the latest developments, my blog, reports, etc. Typically, I would spend about two to three hours in front of the computer answering emails and communicating by other means to outside partners."

The 3 R's are good, but not enough. Another theme identified in the research was that the popular phrase, "Go Green" and the 3 R's (Recycle, Reuse, and Reduce) are

good efforts toward sustainability, but are not enough. Reagan recognized, "Going Green, in popular parlance, means to engage in practices that reduce one's ecological impacts. That and the Three R's are fine terms, but are a bit shallow because they are about actions. In addition to reducing the bad I believe we also need to create new, more sustainable institutions and, even more importantly, more sustainable worldviews—stories about who we are in relationship with each other and the planet." Ted explained in detail that to "Go Green is a nice term, but is sometimes meaningless as people don't have enough information to actually change their behaviour* and downright misinterpret it as consuming more 'natural' things. An example of this is that Going Green does not mean buying organic cotton clothes. Maybe to an extent, but going really green means using your clothes until they can't be used anymore, and then doing something else with them, but not throwing them in the waste basket. It means to ask yourself if you really need something." He Further opined that Going Green and the Three R's are, "nice mnemonics that possibly help some people do the right thing, but they are not near enough. They are only a tip of an iceberg of change that needs to happen and will happen because the world needs radical restructuring of lifestyles." Lastly, Lois stated that there is so much more than going green and the three R's. In fact, she said that "going green is more of an urban term. Meaning, when you actually live sustainably, you are 'green.' You use a bicycle before a car, you buy local or grow organic foods, and you do not just practice 3 R's, you practice 5 R's. In addition to reducing, reusing and recycling, one must rethink (do I really need that?) refuse (saying 'no' to plastic bags, etc.), and make it loud!"As Lois identified, "the world needs radical restructuring of lifestyles," the

researcher identified difficulty as a theme for incorporating sustainability into higher education general education requirements.

Difficulty. The overwhelming response from participants was not a positive outlook for incorporating sustainability into higher education; it was that it is going to be difficult, if not impossible. In fact, Collin stated that "it would be impossible to fully integrate sustainability into traditional general education requirements without a total reformation." However, Ted stated,

> It is difficult to say how higher education could accommodate sustainability because the general education system was not designed to teach sustainability. In fact, quiet opposite. It was designed to teach conformity and consumption. Teaching sustainability means critical minds and minimal consumption. It is not about providing workers for the labor market. It is about teaching for earth citizenship, not patriotism. It is about problem solving with ethics in mind, not competition. I think the whole education system is doomed to fail.

Reagan exemplified this theme by stating, "Academia is inherently competitive, hierarchical, fragmented, theoretical and problem-oriented—all of which is antithetical to really teaching about sustainability." The above responses serve as a transition point for the next theme. The researcher identified that not only is it going to be difficult to integrate sustainability into higher education, it will require massive education of all ages and all levels.

Education at all levels. A major theme within the research data is education. Specifically, each participant explained in detail that to fully integrate sustainability into higher education, there must be education of sustainability. Arnold stated that "the

ministry of education needs to change. It needs to begin at primary school and continue through all levels of education as a component to every subject. It should be written into the national curriculum, and there should be traveling exhibitions with dedicated educators going from school to school." Delores explained that, "courses on sustainability should be integrated in all curriculums whether for science, art, or engineering. It is essential that school children are also taught how to follow rules that will ensure a sustainable future. We must start with all levels of society." Alike are comments from Reagan. He discussed the importance of teaching the students about sustainability. He said that if we "wake-up" students "to the need for change and inspire them to be a part of the process, the rest will follow naturally." Further, Reagan opined that "within academia, I think it is student interest and demands that are driving a lot of institutional change," as a result he recommends educating students at a young age, "listening to them and responding to their needs." Ted continued the conversation by stating, "We are all responsible for enforcing the sustainability change. It needs to be in universities, promoted by the government, encouraged from childhood in the school and home, and on the T.V." Lois wrapped up the education theme by stating, "education on sustainability must start with proper ethics. We must teach children how to be sustainable in order to live a sustainable life."

Sustainability as a way of life. The idea of sustainability as a way of life introduces the next theme. The researcher noticed in the participants' interview responses that sustainability must be a way of life. According to Lois, sustainability is a total reformation of living life, not just one or two green themes; it is incorporating the principles of sustainability into every aspect of your life." Each of the interviewees

suggested that sustainability cannot just be taught in just one area; sustainability must be experienced, which supports the participants' passion for experiential learning in sustainability education. However, unfortunately, as the majority of students are not going to the participants' ecovillages or being immersed in sustainable living, participants found it necessary for hands-on sustainability experiences to become a primary focus within general education.

Experiential learning methodology. Experiential learning was a major theme identified in the research. The process of constructing knowledge through experience is something that each participant referenced in their interview responses. Explicitly, participants identified experiential learning activities such as immersion, service learning, hands-on practice, study abroad, modeling, critical reflection, living and learning laboratories, learner centered workshops, individualized learning plans, field visits, lead through example, participate in host country cultures, and community life. Participants agreed that experiential learning is required in order for students to grasp on to the concepts of sustainability. The interview data revealed that though it would be difficult to fully integrate sustainability into an existing higher education institution, students are catching on, and that gives them hope.

Hope. Although the interview participants had a rather collective melancholy view on the ability to incorporate sustainability into traditional higher education; nonetheless, they remained optimistic that changes were starting to take place. The final theme that emerged in the research was Hope. Participants agreed that although the complete change will be slow, they are hopeful that the change that has started will continue to progress. Reagan said that sustainability changes are "already happening and

they will not end. This is what give me hope!" Similarly, Ted exclaimed that "I think we are seeing the first signs now, and once it starts, I hope it will be quick!" Arnold suggested that he was fortunate to get to work with students on a daily-basis that have already had the spark of sustainability. In comparison, Delores indicated that her work in an ecovillage proves there is hope. She stated, "If it weren't already happening, I wouldn't have a job!" Collin added that sometimes teaching sustainability can be done in as little as a day!" Lastly, Lois has put her hope in the young people of the world. She stated, "As I am teaching workshops geared for young people, I am starting to see more of a passion of sustainability in the schools. I have hope that these children will be the gateway to our transformation; we will just need to experiment with their ideas whether it is with renewable energy or local economy, giving them a space to communicate, discuss ideas, and ventilate their ideas."

Summary

In summary, six experts of sustainability education participated in online interviews for this study in late February and March of 2012. The research participants were given an interview guide through an email attachment, and given approximately one month to return the interview guide with detailed responses to the researcher. The participants were given a lenient amount of time to complete the comprehensive interview guide so that they could think about the questions and answer them at their own pace. Participant responses answered the grand tour and subsequent eleven research questions, which were placed into five sections. Section one Sustainability Defined: The Need and Urgency addresses RQ 1, RQ 2, and RQ 3. Overall the research participants agreed that sustainability has many definitions, but in general, they defined sustainability

as a way of life that is all-encompassing and holistic. To be sustainable, or to live sustainably, requires a balance of efforts that prevent the overuse of resources, as well as to live within systems that are harmonious, self-supporting and non-damaging.

Section two: Change within Higher Education answers RQ 4. According to interview responses, the need for change within higher education is blatantly evident; there is a strong need for change, but it will be difficult to implement. The study revealed that this widespread change is going to require a transformational shift of more than just curriculum, it will require a reformation of perspectives and behaviors, especially within administration. Participants in this study indicated that the process will take a long time, maybe even several generations to implement.

Section three: Developing Curriculum and Integration: responds to RQ 5. Participants had a plethora of ideas of what should be included in the 'new' outlook of education. Suggestions included collaboration of educators from across the disciplines, sustainable arts, an emphasis on the pillars of sustainability, living in community, permaculture design, energy efficiency, sustainable building designs, on-site learning, hands on approaches, a balance of human and earth, bioregional economics, renewable resources, decreasing waste and consumption, recycling, the effects of overpopulation, political and economic stability, and community organization and activism. In addition the researcher accessed public websites and documents from each of the participants' place of employment to view the objectives of each of the sustainability programs. The purpose of location one is to promote sustainability through environmental studies. The purpose of location two is to establish appropriate solutions to the problems in society, promote the viability of a sustainable culture, opportunities to expand educational

experiences and disseminate models in this country. The mission of location three is to create opportunities to live and learn within human-scale communities that are consciously striving to live well and lightly. By offering positive visions and stories for humanity and the planet, ecovillages offer ideal campuses for students to explore possible futures, both in the world in their own lives.

Section four: Teaching Methodology: The Educator, Materials, and Location attempts to address the complex needs of RQ 6, RQ 7, and RQ 8. Participants reported approaches of integration and teaching methodologies, as well as descriptions of 'learning sties' that should be used to appropriately teach sustainability. Overall, participants overwhelmingly supported experiential learning and hands-on practice at a site-based, authentic location. Specifically, participants reported utilizing an ecovillage as the 'best' site for genuine sustainability learning. Further, participants included that the teacher must be involved, passionate, persuasive, a leader, and ethical.

Section five: Sustainability Program Success: Initiation, Assessment, and Maintenance addresses RQ 9, RQ 10, and RQ 11. According to the research participants for this study, sustainability program initiation within higher education is dependent on many factors including, but not limited to, administration, society, students, faculty, and general courses of sustainability. Overall, participants had ideas of program initiation, but they were not optimistic that that higher education would rise to the transformational challenge. Participants recommended that the best way to measure program success was through student response. The researcher concluded that program success is achieved by implementing sustainability curriculum, hands-on, authentic experiences at an ecovillage, or similar, site-based location. Overall, the participants had differing views on program

integration and assessment, but agreed that student application is the most effective way of 'seeing' the results and successful maintenance of their programs. Interview participants measure their maintenance of success through post surveys. Post-surveys ask students to reflect on what they learned, valued, and plan to do with the information gained from their experience. In addition, participants indicated that continued student correspondence and new student interest in their programs were ways in which they measured the on-going success of their programs.

Additionally, the interview responses were used to answer the subsequent research questions as well as the grand tour question for this study, *"What is the process of building holistic sustainability curriculum, and how can it be taught across the disciplines in higher education?"* As one might expect this question cannot be answered in one simplistic response. However, the majority of information can be synthesized into education. Educating society, students, teachers, staff, and administration is key in building a holistic sustainability curriculum, and ultimately integration across the disciplines. Currently, it seems from the reviewed literature, as well as the interview participants, the public is not aware of the immediate need of practicing sustainability as a way of life. As the first step in any new process is awareness and education. Once sustainability zealots build awareness and educate the public, curriculum development and integration can happen. As the research participants clearly pointed out, sustainability curriculum cannot be solely integrated in one area, it must be widespread and interwoven into not only each course at a university, but also the mechanisms which run the higher education institution. Each participant clearly stated their preference in

seeing sustainability embedded into not only general education, but at all levels of education.

Lastly seven themes were also identified with the interview data. Overall themes included spontaneity in sustainability education; the 3R's and "Green" labels of sustainability are surface level and not enough; sustainability would be difficult to completely incorporate into higher education; sustainability requires education in all fields and at all levels; sustainability is a way of life; sustainability needs to be taught through experiential learning; and overall the participants seemed hopeful that changes are starting to happen for a more sustainable future.

CHAPTER 5

Summary, Conclusions, Discussion, and Recommendations

This concluding chapter is structured into four sections that summarize the research for this study. The first section summarizes Chapters 1-4, including a review of the introduction, purpose of the study, literature review, methodology, and findings. The second section reveals conclusions that were drawn from the research findings and thematic analysis of interviews in Chapter 4. The third section is a discussion highlighting the findings and conclusions that emerged from the research. And lastly, section four concludes chapter 5 with recommendations for practice and further study, as well as final thoughts from the researcher.

Summary

Purpose of the study. This phenomenological study explored the need for widespread sustainability, investigated curriculum and teaching methods of successful sustainability programs across the academic disciplines, and revealed effective practices for teaching sustainability in general education. The Grand Tour Question for this research is, *"What is the process of building holistic sustainability curriculum, and how can it be taught across the disciplines in higher education?"* The following research questions guided the study:

1. What is sustainability?
2. Why do we need to practice sustainability?
3. Why is it urgent to incorporate sustainability into curriculum?
4. What are the reasons for widespread change within higher education?

5. What tasks are required to develop curriculum for successful sustainability courses?
6. What instructional methods are appropriate for incorporating sustainability in multidisciplinary courses?
7. How could sustainability be incorporated into existing general education curriculum?
8. Which elements comprise successful sustainability programs?
9. How do institutions successfully initiate sustainability programs?
10. How do institutions assess the success of sustainability programs?
11. How do institutions successfully maintain sustainability programs?

Review of the Literature. The literature review explained sustainability, permaculture, and other relevant terms, in addition to taking a comprehensive look at what is causing the need and benefits of a more sustainable focus. The literature review examined curriculum and teaching methodologies of successful sustainability programs, and included methods of integrating sustainability design into traditional curriculum. The review was presented in the following sections: sustainability origins and overview, including sustainability and permaculture definitions, the need for sustainability, and benefits of sustainability; sustainability within higher education, including classes and programs, curriculum, and best teaching practices; and a discussion of the adult learner and teaching methodology, including the adult learner, learning styles, teaching methodologies, how to incorporate sustainability into existing general education, and curriculum requirements.

The literature review concluded that sustainability is not something that can be achieved by little effort. It is a highly complex topic that requires an understanding of systems thinking and how each individual part is integral to the harmony and balance of sustainability. In addition, there needs to be general knowledge of an all-encompassing definition of sustainability as a holistic approach to self-sufficiency. This approach needs to include a balance of societal, environmental, economic, and healthful needs. Furthermore, one must understand permaculture and means of preserving the land and agriculture for the future. The Permaculture Institute defined permaculture as "an ecological design system for sustainability in all aspects of human endeavor. It teaches us how build natural homes, grow our own food, restore diminished landscapes and ecosystems, catch rainwater, build communities and much more" (permaculture.org, 2011). However, in order to appreciate these complex terms, one must take a step back and understand what is causing the need for this transformative change of higher education institutions.

Human activity is causing detrimental problems that we, as humans, are not realizing until it is too late (Cortese, 2003). Global concerns such as environmental degradation, pollution, negative effects on human health, the concern of a failing American economy, poverty, and commercialization are becoming more popular and are receiving more attention (Taylor, 2012). However, knowledge of sustainability needed by educators to teach the future generations is not there. This deficit is caused by many things. Lidgren (2004) emphasized that due to the multidisciplinary approach to sustainability, the misunderstanding of sustainability, and the general essence that sustainability is not seen as a core issue, incorporating sustainability into higher

education has been a difficult task. A lack of resources, workload units, length of time to see noticeable changes, and the idea of altering the convenience of today's world is causing a delay in sustainability progress (Myers & Beringer, 2010). In addition, teaching sustainability is a difficult task because of the multi-disciplinary approach needed to properly get the importance across and the slow return rate of actions (Ceulemans & Prins, 2010). In order for sustainability components to be incorporated across the disciplines, most educators would need to be re-trained to think of sustainability as a core issue in their field of study, which would be a difficult and time-consuming task.

However, as higher education institutions are at the forefront of innovative ideas and change this is where the change must start. Higher education institutions must take the lead at progressing to sustain the future. In order to move forward, higher education will need to build relationships with the community, reeducate or hire administration, faculty, and staff that are willing to recreate curriculum to include a major focus on sustainability across the disciplines (Junyent & Geli de Ciurana, 2008). In addition, higher education will need to model sustainability on all levels and change traditional teaching methodology to include meaningful experiential and transformative learning (Farish, 2011). Further, program curriculum will need to shift to include a real-world focus that works towards urgent problems; educators will need to lead students through example and practice service work that involves them in the community (Farish). Plainly, traditional higher education must change on all levels to include real-world practice for students. In order to investigate these changes, the researcher interviewed sustainability

experts to determine effective practices for teaching sustainability, and how to integrate curriculum into traditional general education.

Methodology. The procedures and methods that were used to explore integrating sustainability into higher education were presented in Chapter 3. Groenewald (2004) stated that when researching teaching and learning practices, phenomenology is a suitable research design; therefore, the researcher conducted a qualitative, phenomenological study. Qualitative approaches to research include means of collecting and summarizing narrative responses (Lodico, Spaulding, & Voegtle, 2006). The goal of this study was to explore how successful sustainability educators teach sustainability, and how sustainability curriculum could be implemented into general education. Cresswell (2009) suggested using qualitative interviewing to explore a certain phenomenon. Because there was an exploratory nature to this study, the researcher collected open-ended responses from expert sustainability educators with an attempt to understand the phenomenon of teaching holistic sustainability within higher education. Specifically, the researcher conducted six interviews with world-wide experts in sustainability curriculum to gain a better understanding of how to integrate and successfully teach sustainability curriculum. The in-depth interviews were conducted by means of email communication due to the international distance of participants. The interview responses were used to formulate an understanding of how to integrate sustainability curriculum into general education.

Findings. Overall the research participants agreed that sustainability has many definitions, but in general, they defined sustainability as a way of life that is all-encompassing and holistic. To be sustainable, or to live sustainably, requires a balance of efforts that prevent the overuse of resources, as well as to live within systems that are

harmonious, self-supporting and non-damaging. According to interview responses, the need for change within higher education is blatantly evident; there is a strong need for change, but it will be difficult to implement. The study revealed that this widespread change is going to require a transformational shift of more than just curriculum; it will require a reformation of perspectives and behaviors, especially within administration. Participants in this study reiterated that the process will be difficult and take a long time, maybe even several generations to implement.

Participants had a plethora of ideas of what should be included in the 'new' outlook of education. Suggestions included collaboration of educators from across the disciplines, sustainable arts, an emphasis on the pillars of sustainability, living in community, permaculture design, energy efficiency, sustainable building designs, on-site learning, hands on approaches, a balance of human and earth, bioregional economics, renewable resources, decreasing waste and consumption, recycling, the effects of overpopulation, political and economic stability, and community organization and activism.

According to the research participants for this study, sustainability program initiation within higher education is dependent on many factors including, but not limited to administration, society, students, faculty, and general courses of sustainability. Overall, participants had ideas of program initiation, but they were not optimistic that that higher education would rise to the transformational challenge. Participants recommended that the best way to measure program success was through student response. The researcher concluded that program success is achieved by implementing sustainability curriculum, hands-on, authentic experiences at an ecovillage, or similar, site-based

location. Overall, the participants had differing views on program integration and assessment, but agreed that student application is the most effective way of 'seeing' the results and successful maintenance of their programs. Interview participants measure their maintenance of success through post surveys, student narrative, and continued interest in their programs.

Additionally, the interview responses were used to answer the grand tour question for this study, *"What is the process of building holistic sustainability curriculum, and how can it be taught across the disciplines in higher education?"* As one might expect this question cannot be answered in one simplistic response. However, the majority of information can be synthesized into education. Educating society, students, teachers, staff, and administration is key in building a holistic sustainability curriculum, and ultimately integration across the disciplines. Currently, it seems from the reviewed literature, as well as the interview participants, the public is not aware of the immediate need of practicing sustainability as a way of life. As the first step in any new process is awareness and education. Once sustainability zealots build awareness and educate the public, curriculum development and integration can happen. As the research participants clearly pointed out, sustainability curriculum cannot be solely integrated in one area, it must be widespread and interwoven into not only each course at a university, but also the mechanisms which run the higher education institution. Each participant clearly stated their preference in seeing sustainability embedded into not only general education, but at all levels of education.

Lastly, seven themes were also identified with the interview data. Overall themes included spontaneity in sustainability education; the 3R's and "Green" labels of

sustainability are surface level and not enough; sustainability would be difficult to completely incorporate into higher education; sustainability requires education in all fields and at all levels; sustainability is a way of life; sustainability needs to be taught through experiential learning; and overall the participants seemed hopeful that changes are starting to happen for a more sustainable future.

Conclusions

This section summarizes conclusions made by the researcher from the study at hand. The purpose of this study was to investigate how to incorporate sustainability into general education within higher education because of the many problems associated with an 'unsustainable' world. Although the research did not provide an easy approach to implementing sustainability into general education, many insightful methods for integration were discovered.

1. There is a lack of knowledge on sustainability among administration, faculty, staff, students, and society in general.
2. Education at all levels is needed to signify the importance of sustainability.
3. Sustainability is more than just a word to be defined; it is a phenomenon and must become a way of life.
4. Sustainability is the ability to live within systems of interdependence and to not use more resources than are available.
5. To integrate sustainability into general education courses there would need to be a complete overhaul of traditional higher education.
6. Sustainability Curriculum must contain the three pillars of sustainability as well as health education.

7. Experiential, hands-on learning at a site-based location is needed.
8. Sustainability educators must be passionate and inspired to adequately teach sustainability education.

Discussion

In this discussion, multiple conclusions were made from the study at hand, and are framed around the six sections supporting the grand tour and subsequent research questions. Although not all realizations will be easy to implement, much insight was gained on what and how to integrate sustainability into higher education.

Initially, the researcher learned that sustainability is more than just a word to be defined; it is a phenomenon and must become a way of life. Sustainability is the ability to live within systems of interdependence and to not use more resources than are available. Participant responses, as well as existing literature support this idea. Specifically, Smith (2011) stated that sustainability has to be created through an understood combination of social, economic, and environmental dimensions that promote the well-being of all life systems. In addition, AASHE (2011) stated that sustainability is a comprehensive way of life that encompasses human and ecological health, social justice, a secure source of revenue, and an overall better world for all generations to come. The need for sustainability as a way of life is real, alarming, and urgent. The research, as well as participant insight provided multiple examples of how and why sustainability should be a primary goal for higher education.

Previous research also supported that sustainability must be practiced and lived. For example, Matson (2009) stated that great progress in one area does not mean success toward sustainability; in fact, she argued that "the sustainability challenge requires a

coordinated effort that includes all of us, in all fields and disciplines and all programs and agencies" (p. 42). In addition, the researcher concluded from participant responses that because general education reaches the most people, it is essential for sustainability to be incorporated into traditional curriculum. Specifically, Lois stated that, "we must start with the young children and work our way up to post-secondary level." Additionally, Cortese (2003) indicated that because higher education touches the future of generations to come, it is necessary to provide these students with the opportunity to pursue a meaning of human potential, and a realization of resource consumption, pollution, and waste.

However, the urgency of integrating sustainability into traditional education courses is being hidden by the ability of the world to over-consume the resources that are available, but are not able to be replenished. Research participant, Ted, blamed this downfall on media and political leaders that are not demonstrating the real need for a more sustainable world. Nevertheless, as Cortese (2003) pointed out, "the greatest evidence of the need to transform education is the state of the world and the tremendous effort being made by thousands of nongovernmental organizations and schools in environmental and sustainability education to 'fix' the traditional educational system" (p. 16). Evans (2011) indicated that the world is in desperate times, and if continued methods of surviving are not changed, society make not make it to a new horizon without living sustainably. Further, as Cortese and the participants of the research study revealed, more is needed than just one or two classes focusing on sustainability; sustainability needs to be interwoven into curriculum, and the functionality of the university. Research participants encouraged a plethora of sustainability curriculum that should be integrated

throughout general education, not just one or two classes dispersed throughout a student's educational experience. However, the complexity of incorporating sustainability into higher education is overwhelming. In addition to the general lack of information among the public and the detrimental effects of being unsustainable, comes the traditional focus of higher education.

Higher education's customary focus on providing students a specialized education in their discipline is antithetical for sustainability. According to Cortese (2003) higher education is generally organized into highly specialized areas of knowledge and traditional disciplines, which stresses competition and individual focus. In addition, several research participants brought up the need to get away from this highly specialized structure of teaching in the disciplines, and refocusing the traditional education system. Specifically, Reagan stated that higher education teaches the direct opposite of what and how sustainability should be experienced. Similarly, Cortese stated that in order to create a sustainable future for humans and the planet, a paradigm shift that focuses on collaboration and a universal perspective is necessary. In reiteration, the 'teaching' of sustainability cannot just be in one or two classes, it must be demonstrated by faculty, staff, students, the administration, and the university as a whole. The classroom must serve as a true-to-life practice of sustainability, and educators must reorient curriculum to be interdisciplinary and more of an ecopedogogy. Gadotti (2010) defined ecopedagogy to be a pedagogy that is appropriate to educational practices based on sustainability. This study revealed specific tasks, or guidelines, that can be used to develop sustainability-focused curriculum, and how sustainability can be integrated into existing general education.

The researcher learned that in order to incorporate sustainability into existing curriculum, first and foremost education is needed. The public, faculty, staff, administration, and students will all need to be educated on the detrimental effects of human action, consumption, convenience, dependence, and ignorance on human and environmental health. Although the results of unsustainable actions may not be seen immediately, they exist, and they are real. In order for people to realize the vital importance of these issues, successful program measures must be implemented. Therefore it is necessary to find educators who are passionate about sustainability to teach the consequences of human activity, as well as restructure traditional curriculum.

Cortese (2003) stated that not only individual programs will need to transform, but education as a whole, will need to change at all levels. AASHE (2011) gives fifteen recommendations for integrating sustainability into traditional higher education. Specifically, AASHE recommends:

1. Develop a better public understanding of sustainability
2. Set clear goals and targets
3. Provide leadership opportunities and professional development
4. Share resources
5. Bring together high impact educational practices and sustainability education
6. Include sustainability in strategic documents
7. Develop language for hiring practices that would attract sustainability faculty
8. Examine the ACUPCC commitment related to EFS
9. Bring together campus leadership with businesses and community leaders to seek collaboration and funding

10. Educate trustees/regents and solicit their support
11. Encourage the submission of proposals for funding sustainability education
12. Participate in relevant and federal policy making that furthers EFS
13. Bring faculty together with sustainability oriented staff
14. Provide mechanisms for recognizing and addressing barriers to EFS
15. Recognize sustainability curriculum efforts

Although participants did not touch on all of these criteria for integrating sustainability into higher education, the majority did emphasize the importance of gaining societal, administrative, faculty, and student support, as well as building a sustainability-focused curriculum.

The literature used for the base of this study, as well as participant responses, demonstrated the importance that curriculum must shift to focus on the application of sustainability education. Evans (2011) defined sustainability curriculum to be the, "rise to the challenge of making teaching and learning relevant, responsible, and practical in a time when ecologies and economies are perched on the brink of collapse" (p. 439). Praetorius (2006) suggested teaching through permaculture experience is an effective way to teach sustainability. This process involves working with nature, not against it, demonstrating that everything is connected, planning for efficiency, maximizing resources, and caring for human and environmental health. In addition, Rios (2010) recommended embedding permaculture principles into sustainability curriculum by giving students the opportunity to observe and interact with their learning environment, exposing students to a diverse teaching methodology, encouraging self-regulation and

critical reflection, and the challenge to produce zero waste. Rios stated that by creating the sustainable experience, learning will come alive.

Practical, or experiential learning was a major theme revealed by this research study. David Kolb (1984) is credited for experiential learning theory. He described the learning process as creation of knowledge by the relationship among learning, work, and life activities, which are the primary methods of learning sustainability indicated by participants. Specifically, Lois stated that in order to learn sustainability, one must practice, work, and live in a place where they can learn through experience." Likewise, research by Farish (2011) supported experiential learning and successful sustainability education. He found that learners need to be engaged in hands-on, insightful experiential learning to truly grasp the importance of sustainability. The process of constructing knowledge through experience is something that each participant referenced in their interview responses. Explicitly, participants identified experiential learning activities such as immersion, service learning, hands-on practice, study abroad, modeling, critical reflection, living and learning laboratories, learner centered workshops, individualized learning plans, field visits, lead through example, participate in host country cultures, and community life. Participants agreed that experiential learning is required in order for students to grasp on to the concepts of sustainability.

Precise instructional methods such as those identified by the participants are needed for teaching sustainability, and are all part of experiential learning theory. Specifically, hands-on practice, field work/site work, immersion, service learning and community building, role modeling, and critical reflection are all methods of teaching and learning sustainability. Each participant interviewed responded with particular

aspects of experiential learning to be the most effective method for teaching sustainability. In addition to experiential learning, the participants indicated that students will need immersion in a sustainable-living site to fully understand the need and importance for sustainability. Likewise, AASHE (2011) recommended full immersion and hands-on experiences in 'regional centers' for sustainability education.

Lastly, in this research study, methods for initial and ongoing program success were examined. Participants indicated that once society becomes educated, and there is recognition of the importance of sustainability living, institutions must have successful program measures in place to full initiate programs into higher education. Such methods include passionate educators and students, a field site for practical application and observable results, student feedback, action, and recommendation, and continued interest in the program. Researchers such as Gadotti (2010) also support these measures of program success. Specifically, Gadotti specified that program success can be measured by if a student has a transformational experience. She stated that students need to be involved in a meaningful experience to transform them and challenge them to lead a more sustainable life after the program is complete. Further, Evans (2011) indicated that in order to fully understand the success of the critical pedagogy of sustainability one must go beyond the walls of an academy; ultimately it must be experienced outside of the classroom and educational institutions and lived by individuals in the community. In order to assess ongoing program success research participants suggested that educators will need to utilize student reflection and response, action, and recommendation. Participants revealed that one major measure of continued program success is student recommendation, and new student interest.

Recommendations

Recommendations from the research. This research study added to the body of literature that supported sustainability in higher education. The findings, conclusions, and discussion of the study at hand serve as an example for faculty, staff, students, and administrators in higher education institutions who are passionate about in integrating sustainability into general education. The following recommendations for professional sustainable practice are a result of the data collected from this study. Recommendations are listed based on the general themes of the findings, followed by a summary related to the research questions.

1. Primarily, education is needed to signify the importance of the phenomenon of sustainability. Once this realization has been made, the next step is to obtain support from the administration, faculty, staff, and students of an institution, as well as buy in from the public. When these initiatives are in place, the process of integrating sustainability into higher education must involve an overhaul of traditional educational views. Specifically, educators and students must learn how to understand the interdependence of disciplines, society, the economy, and the environment. Once a base understanding is established the 'how to' is incorporated by experiential learning through hands-on application of ideas, an authentic sustainable site, passionate teachers and interested students. Program success and continued program maintenance are indicated by student response, action, and continued support for the program.

2. The researcher concluded that first and far most education on the need for sustainability, as well as the core of sustainability, are needed on a wide-scale basis. To put it simply, there is lack of knowledge on sustainability. Due to little awareness of

detrimental problems such as over consumption, climate change, chemical use, outsourcing, the downward spiral of the economy, inflation, dependence, convenience, ignorance, and much more humans and the planet, are headed for a world of trouble. The researcher found multiple ways in which the study and practice of sustainability can help to counteract the problems, and prevent them from engulfing the world. Drawing from the interviews and the literature, the researcher realized that a wealth of knowledge of sustainability among the public, students, faculty, staff, and administration is needed for an overhaul of general education. According to Juyant and Geli de Ciurana (2008) not only the curriculum must be reoriented to include a sustainability focus, but also the entire face of a university. This process will require understanding, acceptance, buy-in of sustainability, and ultimately a refocus of the educational ministry. Because the general population, as well as many businesses and organizations look up to higher education institutes, the next step necessary for higher education to is to take the lead on wide-spread, societal education on sustainability. The researcher concluded from participant responses that change must start with education, and education must start with students and existing sustainability educators.

3. The process must involve a complete overhaul of traditional education to include experiential, hands-on learning where students not only learn the importance and reasons for practicing sustainability, but also the practical application of what to do. Participant responses indicated experiential learning to be the most effective method for sustainability education. In addition, Farish (2011) found that in order for sustainability to be successful in higher education, the learner must feel a connection to, or a reason for practicing sustainability. As adult learning theory supports experiential learning (Kolb,

1984), it is necessary to consider embedding experiential sustainability into general education . Adult learning theory revolves around experience and should be considered when building sustainability curriculum pedagogy. Whether that experience is derived from student motivation, formally or informally, self-directed, critically reflected upon, or transforms the adult learner's viewpoint, the key to successful adult learning is the ability to personally connect and find value in one's experience. Personal connections are made through one's ability to link new knowledge with prior knowledge, which is a key component of the learning process and sustainable education.

4. Sustainability curriculum must be comprised of the three pillars of sustainability, as well as contain a general health component. Research participants provided a plethora of ideas of courses and methodology for sustainability education, but overall, every piece of sustainability education ties into environmental, economical, societal, or healthful education. Although the research participants concluded that the curriculum is important, there is more to sustainability education that just what is taught. Insights also included the location, materials and educator for sustainability education.

5. Sustainability education must expand from the the traditional classroom to include a field, or site-based learning experience so that students can experience first-handedly what they are learning. In addition, there must be evidence of sustainability embedded throughout the sustainability site. Specifically, research participants stated that there must be natural buildings, energy and resource conservation, demonstration of zero wastes, and organic gardens.

6. The type of person required to teach sustainability is a personality, not necessarily someone that can be, "created." For example a teacher of sustainability has to

be inspired in an individual, it is not something that can be initially learned; it has to be innate, or created from a transformational experience. Participants revealed that a sustainability educator must be passionate and a role model for sustainability living. The study indicated that if all of these components are initiated, practiced, and maintained, sustainability education will be successful.

Summary.

Sustainability Defined: The Need and Urgency.

1. This research study found that it is necessary to define sustainability as a way of life and then practice sustainability living on a daily basis.
2. The results of this study revealed that the general public is lacking in knowledge of the immediate need to practice sustainability. The researcher recommends educating the public, faculty, staff, and students on the urgency of unsustainable practices and the importance of sustainability education.

Change within Higher Education.

1. Due to the traditional discipline-specific focus of higher education, this study recommends transforming highly specialized disciplines to include an interdisciplinary, collaborative focus.
2. The researcher recommends that sustainability become the core of all education at all levels.
3. Because higher education institutes are viewed with prestige and at the forefront of current knowledge, it is recommended sustainability education be integrated as a whole into general education curriculum in which all students would be exposed.

Developing Curriculum and Integration.

1. When developing curriculum for sustainability education it is recommended that the three pillars of sustainability, as well as human and environmental health are embedded into an ecopedagogy.
2. Curriculum should include a permaculture-focus.

Teaching Methodology: The Educator, Materials, and location.

1. Experiential learning should be the primary method in which sustainability education is taught.
2. As sustainability enthusiasts progress forward, the incorporation of hands-on experiences that would foster an ethical responsibility for sustainable practices should be implemented.
3. The educator must be passionate and a role model for sustainable living.
4. Sustainability educators should have authentic, sustainability materials when teaching sustainability. Examples would include natural building materials, energy, and organic food gardens.
5. It is highly recommended that when teaching sustainability, students are immersed in sustainability education through field or site-based living.

Sustainability Program Success: Initiation, Assessment, and Maintenance.

1. For sustainability program initiation, this study recommends having passionate, sustainability-practicing educators, an authentic learning site, and experiential learning opportunities for student practice.
2. Assessment of sustainability programs should be measured through student reflection and progress toward a sustainable life.

3. Program maintenance should involve post surveys eliciting student feedback, as well as detailed descriptions of how the student is practicing a sustainable life.
4. Lastly, it is recommended for maintaining successful sustainability programs, there needs to be a continued interest in educators and student participation.

Suggestions for Future Research. This section provides recommendations for further research in this area. This study examined six sustainability experts' insight on how to integrate sustainability into general education. Since the research participants were, or have been, directly involved in a sustainability ecovillage, future studies could investigate the existing full-immersion sustainability programs through a participant observer account to gain a more comprehensive view of the sustainability education programs, and therefore to have an inside perspective of what is needed to implement an immersion-based sustainability program. In addition, since a general theme that emerged in the research was the difficulty of incorporating this caliber of sustainability program into higher education, additional research could investigate sustainability educators who teach in a more traditional academic setting. Another suggestion for further research could be to expand the current study by involving more research participants to include more sustainability educators that have a more academic focus. A new research study could focus on student perspectives of how sustainability education could be implemented into higher education. Lastly, research could focus more heavily on how to educate the public and create a supportive network for sustainability integration.

Summary

This research study used in-depth interviews to investigate how to integrate sustainability into traditional general education. Although including sustainability into

higher education is a daunting task, it can be done. There are existing sustainability programs that have proven that it is possible. The real and immediate task is educating the public on the need for these widespread changes. Specifically, this study revealed an urgent need to integrate sustainability education, or an ecopedagogy, into traditional general education requirements. These results provide insight for what and how to educate with a sustainability focus. Interview participants revealed that widespread education is needed, and that experiential learning methods are most effective for teaching sustainability. The study discovered that students must experience what they are learning in order for a transformational learning experience to occur. Sustainability can be fostered in an individual, and developed, but there must be understanding of the need and therefore a passion to transform one's traditional lifestyle. As much of the world's turmoil is based on convenience, dependence, and ignorance, the time is now to educate on the urgency of sustainability.

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Appendix A Interview Protocol

Topic: To investigate how to incorporate sustainability into general education requirements.

Face Sheet:

Account:
My name is Brooke Charity Sydow. I am a graduate student in the Education Administration, Adult and Higher Education Program at the University of South Dakota. In order to complete my doctoral degree, I need to conduct original research. As part of my responsibilities for the degree I would like to conduct interviews to investigate best teaching practices for sustainability. For the purpose of this interview, I am investigating sustainability curriculum and effective teaching practices of sustainability educators. I will specifically ask you to explain your knowledge of sustainability curriculum and effective teaching practices.

This interview will be self-paced. I will only utilize the information that you provide, and you will be in no way identified. When I have concluded my study, I will report only the findings that you and the other participants disclose. If at anytime you are uncomfortable or desire to end the interview, please let me know. Again, this information will remain confidential. I want to thank you in advance for your participation.

At this point, if you are willing to be interviewed, please complete the following interview guide, and return to me at your earliest convenience.

Transition:
We'll start off by verifying some information. Then we'll ease into some more specific questions.

Would you verify the spelling of your first and last name?

Date and time of interview:

Place of interview:

Demographic Information:

As we begin, I would like to start by asking a few questions about yourself and your

background.

A. Please indicate your sex:

B. What is your date of birth?

C. Where is your birth place?

D. Where do you consider your home now?

E. What is your education level?

F. What is your occupation?

G. What kind of work do you do?

H. Would you give me an example of a typical day?

I. How long have you been in your current position?

Knowledge of Sustainability

As we progress, I would like to gain an understanding of your knowledge base on Sustainability.

1. Please explain your definition of the term sustainability:

2. Where did you learn about it?

3. Who or what specifically 'taught' you about sustainability?

4. What do you think it means to be sustainable?

5. How do you view the terms reduce, reuse and recycle (three R's)?

6. Why?

7. What do you think it means to 'go green'?

8. Can you give some specific examples?

9. What do you believe to be the urgency level of sustainable practices?

10. Why? Please explain in detail.

11. In your opinion, what is the core of sustainability?

12. How did you come to this conclusion?

Interest Level in Sustainability

Now that we have established a basis for sustainability, let's focus on your interest in achieving a more sustainable community and university.

1. How would you rate your interest level in sustainability?

2. Have long have you practiced sustainability?

3. How do you practice sustainability? Please provide some examples:

4. How do you practice the three R's? Please provide examples:

5. What is your interest in learning more about sustainability?

6. How would you rate the interest of the general public in learning how to be sustainable?

7. Why?

Educating on Sustainability

As we move from knowledge and concern for sustainability, I am interested in learning how you believe we can turn these ideas into practice.

1. What do you view as the most important part of sustainability?

2. Why?

3. What components should be included in sustainability curriculum? Please be specific and provide examples.

4. In your opinion what teaching methodology is most effective for teaching sustainability?

5. What kind of person is needed to teach sustainability?

6. Approximately how long does it take to teach the basics of sustainability?

7. What materials are needed to teach sustainability?

8. Please explain an ideal sustainability teaching site:

9. How would you explain a typical learner for sustainability?

10. How do you think sustainability could be incorporated into General Education Requirements? Please be specific and give examples:

11. What do you think will be the biggest challenge of this process?

12. How would you recommend tackling the challenge?

13. Where do you think this change needs to start?

14. How long do you think it will take?

15. Who will be responsible for enforcing the change(s)?

16. What sort of criteria need to be set?

17. How do you think a GER pertaining to sustainability should look **after** the changes are in place?

18. Please explain your interpretation of a new GER:

19. How do you assess or evaluate your program?

20. What contributes to a successful program?

21. Do you have any other ideas for incorporating sustainability into higher education?

22. Is there anything else you would like to add on any of these topics?

23. If you are willing, please include any materials that you use to teach sustainability.

Thank you for participating in this interview. You feedback is valuable to the study of incorporating sustainability into general education requirements.

Appendix B Cover Letter Consent Form

Dear Participant,

I am conducting a research study entitled, "Sustainability Design in Higher Education: Curriculum, Teaching Methods, and Integration" as part of my doctoral dissertation at the University of South Dakota. The purpose of the study is to gain an in-depth understanding of sustainability curriculum, best teaching practices, and successful implementation measures.

You are invited to participate in this study by completing the attached interview questions. I realize that your time is valuable, and I appreciate any feedback you are willing to give. Your participation in this study is voluntary. If you are unable to answer one of the questions, please leave it blank. There are not any correct or incorrect answers. You may withdraw from the study at any time without consequences. Your expertise and ideas will be used for the purpose of research.

Your responses are strictly confidential. When the data analysis is completed you may be asked to confirm my interpretation of your responses. You will not be linked to the data by your name, title, or any other identifying item. Please assist me in the completion of the research by completing and returning the interview questions. Your consent is implied by the return of the completed interview questions.

Please keep this letter for your information. If you have any questions, now or later, you may contact me at the number below. Thank you very much for your time and assistance. If you have any questions regarding your rights as a research participant in this study, you may contact the USD Vice President for Research at (605) 677-5370 or humansubjects@usd.edu. You may also contact my dissertation advisor, Mark Baron, PhD at 605-677-5269.

Sincerely,

Brooke C. Sydow
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