

HOW CAN FORMAL ADMINISTRATIVE STRUCTURES ENHANCE  
SUSTAINABILITY IN LIBERAL ARTS COLLEGES?:  
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Fiona Haslett

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## **ABSTRACT**

The “institutional inertia” for Education for Sustainability (EfS) in liberal arts institutions is often attributed to faculty perceptions that EfS is not relevant within their area of expertise. However, sustainability is most effectively integrated into an institution when the formal administrative structures align to prioritize a whole system approach. After conducting 40 interviews with professors across all divisions, we developed an understanding of academics’ attitudes, values, and experiences to identify areas where EfS can be more effectively woven into informal campus activities and curricula. In addition, the formal administrative structures of Higher Education Institutions (HEIs) can promote incongruences between faculty beliefs and campus practices.

Findings from this qualitative study are divided into three hypotheses that a liberal arts education should: (1) transition away from teaching within disciplines and establish curricula structured around the process of learning, the development of skills, and the acquisition of knowledge through transdisciplinary topics, (2) create a context for student learning that engages the affective domain and fosters opportunities to develop individual values, attitudes and passions, (3) prioritize a process of learning that includes active participation and an inquiry-based approach to develop students as leaders and agents of change.

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## INTRODUCTION

With more than 21 million students enrolled each year and with an operating budget of over \$432 billion, higher education holds tremendous human and financial power to influence the learning opportunities for future leaders and change-makers (National Center for Education Statistics 2013). The curriculum and formal administrative structures of higher education institutions (HEIs) hold the power to generate knowledge, develop awareness about personal values and promote active learning opportunities to a diverse group of people (Buckley 2014).

### *Higher education and sustainability*

HEIs have critiqued modern society and challenged students to identify the current limitations that exist in politics, science, and education. “Higher education bears a profound moral responsibility to increase the awareness, knowledge, skills and values needed to create a just and sustainable future” (Orr 2004, p. 17). Buckley (2014) identifies that many HEIs strive to create educated citizens who are equipped to foster democracy, support the economy, and affirm the human-environment relationship. In the last decade, the intention to integrate sustainability into higher education has increased as schools strive to translate the ‘idealist language of sustainability’ into concrete environmental and social goals (Shriberg 2004).

In 1972, when the Stockholm Agreement first presented topics of sustainability to Higher Education at an international level, liberal arts colleges and universities were just beginning to train faculty about sustainability related principles, knowledge, skills, perspectives, and values (Yarime & Tanaka 2012). Since then, many other international

charters have developed, including the Tbilisi Declaration (1977), the Talloires Declaration (1990) and UNESCO Decade for Sustainable Development (2005-2014); however, none of these have offered concrete prescriptions at an operational level about ways to integrate these topics in to the curriculum (Roorda 2000).

The Talloires Declaration, in particular, formalized the commitment of 250 HEIs to shift their operational activities and to develop curriculum that promotes education for sustainability (ULSF 2013). This document issued ten tangible goals about the environment and sustainability for higher education (ULSF 2013). In conjunction with the Talloires Declaration, the American College and University President's Climate Commitment (ACUPCC) asked institutions to create holistic plans to prioritize and address climate change. Recently, the goals of education for sustainability (EfS) have been promoted by the United Nation's Decade of Education for Sustainable Development (2005-2014) which defines sustainable development as a dynamic concept focusing on the development of knowledge, skills, perspectives, and values to empower people of all ages to assume responsibility for creating and enjoying a sustainable future (UNESCO 2005). The Decade for Sustainability utilizes five pillars of learning to organize its outcomes: learning to know, learning to do, learning to live together, learning to be, learning to benefit themselves and others now and into the future (UNESCO 2005).

*Association for the Advancement of Sustainability in Higher Education (AASHE)*

In response to the momentum set by international protocols and the Decade for Sustainability, AASHE worked to capitalize on a demand for cross-institutional evaluations in higher education. To accomplish this task, AASHE developed a shared tracking assessment and rating system (STARS) based around sustainability actions on

campus, where more than 200 institutions, including Colorado College, annually determine their points relative to the STARS metric. These points are divided into four categories: engagement, operations, academics and policies and provide “a quick, yet penetrating way to measure status, progress, priorities and direction” (Shriberg 2002 p. 155). Currently, STARS attempts to not only portray the current relative standings of colleges and universities, but also to integrate motivations, processes and outcomes in a comparable framework that moves beyond the standards for eco-efficiency (Shriberg 2002).

### *Liberal arts and sustainability*

The priorities and outcomes present in the AASHE STARS metric parallel the values and learning outcomes of a liberal arts education. Empowerment stands as a pillar in a liberal arts education and works to cultivate students who are thoughtful and make skill-based decisions about the multifaceted relationships between individuals, society, environments and economies (Rickards *et al.* 2015). College campuses and curriculum require a broad and systematic approach to address the complexities and challenges that affect sustainability practices.

A strength of liberal arts institutions is their capacity to mix undergraduate teaching with scholarly research while incorporating a wide range of educational practices that vary from traditional classroom lectures and discussion to a heavy emphasis on independent study (Astin 1999). Today’s society needs scientists, engineers, and business people prepared to establish systems that sustain rather than degrade the natural environment. Given the wealth of knowledge present within liberal arts institutions, these

schools have a heightened responsibility to educate graduates to ensure a high quality of life for future generations.

Today, many liberal arts institutions are committed to integrating sustainability education into their curriculum, institutional activities, and environmental practices (Savanick *et al.* 2008). These schools catalyze social change through inspiring intellectuals, leaders, and future change makers (Cortese 2003; Lozano 2006). However, despite the societal momentum, external support, and enthusiasm for implementing this curriculum, EFS is not often institutionalized

Sterling (2010) identified a paradox to explain the limited presence of sustainability in the curriculum. He outlines, “the more conceptually far-reaching the movement has become, the more strategically ambitious, the more difficult it is for education to respond adequately” (p. 47). As sustainability has evolved to encompass many perspectives, topics, and philosophical points, education cannot effectively respond and teach to these topics from a single discipline. Blewitt and Cullingford (2010) and Lipscombe (2007) agree that limited progress on universities integrating sustainability into the curriculum can be attributed to the inability for faculty, staff, and students to understand how institutions can overcome “institutional inertia, dislocation of knowledge, and curriculum pedagogical divide” (Greig 2015, p. 28). No single discipline can hold all the insight about all of these issues; for this reason cross-disciplinary collaboration is essential (Cortese 2003).

Integrating sustainability into the fabric of liberal arts colleges requires a specific commitment to teaching and learning. E. F. Schumacher (in Segalas 2009, p. 276) states, “if more education is going to save us, it would have to be education of a different kind: an education that takes us into the depth of things.” In addition, Sterling (in Corcoran &

Wals 2004) identifies that “sustainability requires a fundamental change in epistemology to [have] students obtain skills related to critical thinking, systemic thinking and the ability to work within transdisciplinary frameworks to develop values aligned with sustainability.”

### *Head, heart and hands*

Weaving sustainability into the curriculum of HEIs asks educators to shift their approach toward education. This transformation includes rethinking methods, recasting priorities and ultimately reorienting communities. In addition, educators must restructure educational paradigms and learning processes to honor both the context and content of learning (Tilbury & Ryan 2011). Tilbury and Ryan (2011) outline five pedagogical principles to integrate sustainability effectively: 1) futures thinking, 2) creative and critical thinking, 3) participatory learning 4) systemic thinking, and 5) partnerships (p 5).

Sipos *et al.* (2007) mirror Tilbury and Ryan’s five principles in the description of “transformative sustainability learning (TSL).” TSL directs the process and content of learning to achieve transdisciplinary collaboration by creating a series of learning objectives that correspond to the cognitive (head), psychomotor (hands) and affective (heart) domains of learning. Sipos *et al.* (2007) suggest integrated learning processes in three areas: (1) cognitive domain: through knowledge, academic study and understanding sustainability, (2) affective domain: enabling values and attitudes to translated into behavior and (3) psychomotor domain: through practical skill development and physical action. This constructivist approach empowers individuals to change their perspectives and values and enhance their ecological, social and economic justice awareness (Moore 2005).

i. *Cognitive Domain*

A critical part of EfS is learning about humans' relationships to the world. One way to holistically address sustainability in the curriculum is through transdisciplinary topics. Transdisciplinary learning is defined as the generation of knowledge that occurs between, across or beyond disciplines (Nicolescu 2014). Today, many educators agree that most learning happens beyond the boundaries of a formal educational setting, and teachers must shift to become facilitators and enablers of learning opportunities (UNESCO 2005). Teachers need to illuminate issues from multiple perspectives and identify the discrepancies between theory, practice, and logic and economy. In academia, balancing these discrepancies can be frustrating. However, studies have shown that a transdisciplinary approach can increase the level of motivation and empowerment to take action (Merck & Beerman 2015).

ii. *Affective Domain*

Although the acquisition of knowledge creates the building blocks for sustainability, the affective domain enables students to illuminate the connections between humans and the natural world and reflect upon values and attitudes present in a sustainability curriculum. Learning outcomes such as empowerment, creativity, and fun establish an emotional connection and awareness of EfS that instills a greater commitment to learning and inspires autonomy to participate and to act as decision makers (Moreno-Lopez, 2005; Sipos *et al.* 2007). The opportunity to incorporate emotions and values into learning empowers students to apply new information practically.

### *iii. Psychomotor Domain*

Beyond evoking the acquisition of knowledge and values, liberal arts institutions should prioritize co-curricular informal learning opportunities outside the classroom. Participatory and action-oriented learning relies on hands-on experiences and interpersonal relationships with peers to help learners question their assumptions and develop their own perspectives about sustainability (Brockbank & McGill 2004; Cebrian *et al.* 2015). Based on Sterling's (2004) approach to sustainability efforts, the extracurricular sphere serves as a potential locus for integrating sustainability education due to its subject neutrality, permeability, and fluidity (cited in Lipscombe 2007).

As Corcoran and Wals (2004) recall, it is more effective to open up a space for conversation and learning rather than treat sustainability as a predetermined product. One way to create this space is to structure campus environments as places for learning rather than as places for experts. As Savanick *et al.* (2008) mention, campus sustainability projects have the opportunity to link campus operations with the curriculum and academic mission. Currently, many campuses do not perceive sustainability projects as academic resources. Rappaport and Creighton (2007) state:

One of the great unexplored opportunities in the university community may be faculty and their students working with administrators and staff to address climate change on campus... There can be a chasm between faculty and student activities and those of operations... but it can be bridged (p. 280).

Bridging this "chasm" between formal and informal learning opportunities asks education to redefine learning and extend learning opportunities through collaboration with staff members and peers.

### *Administrative structures*

The term ‘education for sustainability’ suggests a style of learning that eschews the memorization of facts and instead supports the development of knowledge, values, and action. Addressing sustainability within universities has been cited to require transdisciplinary academic priorities, an awareness of personal connection and a commitment to participatory community outreach programs (Sterling 2004; Tilbury & Ryan 2011; Yarime & Tanaka 2012). To enact change, sustainability action plans must confront ‘university silos’ and ‘corridors of power’ and utilize a democratic, participatory process of change to redefine the teacher-student relationship (Tilbury & Ryan 2011). The transformation of a liberal arts institution requires a realignment of the formal administrative structures to take advantage of the potential overlap and intersections between structures to create enhanced learning opportunities and empower agents of change.

To streamline sustainability efforts on campus and in the curriculum, university administrations must create a structure of institutional communication that integrates staff and faculty into the same culture. Very rarely are staff and faculty members deliberately hired with the purpose to link academics and administration. Richardson and Lynes (2007) noted that effective leadership, realistic benchmarks, and collaboration between administrators and academics are all critical to implementing sustainable practices on campus. Some universities have established committees comprised of administrators, staff, faculty and students to open lines of communication between facilities and academics. Other schools have created a formalized sustainability manager position to help facilitate this communication.

*Current Gaps in Research:*

Most of the literature written about sustainability in higher education falls within two categories. The first category includes organizational guidelines that support educators while the second category focuses on specific programs. Most of these studies are descriptive and identify specific strategies and initiatives at individual institutions. Other studies describe early institutional actors that demonstrated ground level, “best practice” initiatives for change (Stephens 2010). Today, there are a limited number of studies that critique the effectiveness of formal administrative structures in integrating sustainability into the fabric of a school.

## **RESEARCH CONCERNS**

The goal of this project is to initiate a dialogue about ways that the formal administrative structure of liberal arts institutions can more effectively coordinate sustainability efforts on campus and in the curriculum. In addition, this study aims to better understand the Colorado College faculty's perspective on sustainability education in order to effectively incorporate sustainability into the fabric of the school.

This study aims to:

- 1) Understand faculty's current understanding and attitudes of sustainability;
- 2) Learn about the current administrative barriers that obstruct integrating sustainability into a liberal arts institution;
- 3) Recognize ways to create an effective administrative structure to promote sustainability across campus;
- 4) Provide future recommendations to the college with aligning formal administrative structures to support sustainability.

## **METHODOLOGY:**

### *Research site*

Colorado College is a nationally ranked liberal arts college in the western United States with approximately 2,000 undergraduates and 200 full-time faculty members. Colorado College offers 42 majors and 33 thematic minors. Located in the Rocky Mountain West, Colorado College uses the southwestern culture and environment to prioritize experiential and place-based learning opportunities. The college is distinguished by the Block Plan, a unique academic structure, where students take one course at a time. This academic calendar demands rigorous study and cultivates a culture of strong student engagement and provides ample opportunities for co-teaching interdisciplinary topics.

The mission of the college is to ‘provide the finest liberal arts education in the country’ by adhering to a strong set of core values. One of these core values specifically evokes themes of environmental stewardship: “nurturing a sense of place and an ethic of sustainability.” While the college claims to value sustainability, the broad level of community awareness and activism could be improved. While CC supports an interdisciplinary, innovative and creative spirit, the faculty, students and staff often operate in individual silos. With a culture resistant to policies and top-down management, decision-making is often opaque and systematic procedures are not articulated as often as they could be.

Conversations about themes of campus sustainability began on the Colorado College campus in 1970 when EnAct, the student run environmental action club was created. In 2003, more formal conversations about sustainability commenced, when the president at the time appointed a ‘Working Group on Campus Sustainability’ to inform

the strategic plan. This working group of eighteen members included faculty, staff, administrators, current students and alumni. Their first task was to encourage the Board of Trustees to sign the University Leaders for a Sustainable Future (ULSF) as a symbolic act to join an international group of colleges committed to advancing sustainability in Higher Education. Although the Board of Trustees declined joining this movement, in response, they included a values statement focused on environmental sustainability.

The following year the President brought together a diverse group of students, faculty and staff to form the permanent Campus Sustainability Council, an advisory group focused on campus sustainability. The strength of this committee lies in its diverse representation and collaborative process. However, because the Council is purely an advisory council to the president, it often lacks effective decision-making authority (Schild 2010). The Campus Sustainability Council strives to erode the campus silo mentality by working across disciplines. Once established, this democratic group became the primary organizing body for campus sustainability initiatives and advocated to establish an Office of Sustainability with a full time director. While some community members believed a sustainability manager position would centralize coordination and improve the sustainability movement, others felt that it would remove responsibility and accountability (Schild 2010).

In 2007, a current faculty member stepped into the role of the Campus Sustainability Director (in addition to his current duties). During that year, then president of the College faced a campus-wide push to sign the President's Climate Commitment and thought deeply about what it would mean for the campus and how Colorado College would accomplish the goal. The following year, the Board of Trustees approved Colorado College as a signatory to the President's Climate Commitment. This gesture catalyzed an

ambitious plan to cut greenhouse gas emissions and achieve carbon neutrality by 2020. From that point forward, Colorado College was committed to acting as a model for sustainability and joined a national movement of colleges working to restructure their operations and integrate sustainability into the curriculum.

Prior to establishing a formal Office of Sustainability, all sustainability efforts were housed within Facilities and lacked a formal reporting structure within the administration of the college. Finally, after years of contracting outside consultants to establish a campus energy management plan, in 2010 the college hired a full-time Campus Sustainability Coordinator. This permanent position legitimized the campus energy plans, created tremendous momentum for the community, and raised awareness across campus.

The responsibilities outlined for the Campus Sustainability Coordinator to manage both the facilities and education components of campus sustainability reflected too much work for one person. Subsequently, in 2012, the Campus Sustainability Coordinator position was split into two: one focused around facilities and energy management, and the other around education. While the Campus Energy Manager position focused on technical operations to achieve carbon neutrality, the Campus Sustainability Manager worked to shift behavior through education and incorporating sustainability themes into the curriculum. For the first time, the Campus Sustainability Manager reported to the Associate Dean of Faculty, within the formal academic structure of the college. Today the leadership structure at the College continues to prioritize sustainability efforts across the curriculum, and campus efforts continue to evolve and become more transparent.

### *Qualitative Case Study Approach*

We employed a qualitative case study approach that uses grounded theory to analyze the faculty interviews focused on the curriculum at Colorado College. A qualitative approach incorporates direct quotations from in-depth, open-ended interviews to illuminate the experiences of professors and evaluate their effort to incorporate sustainability into the curriculum through systematic inquiries of activities, outcomes, judgments and future plans (Patton 2002).

The approach, derived from grounded theory, generated themes and patterns based on real world empirical evidence extracted from interviews rather than from theoretical constructs (Patton 2002). Grounded theory integrates a systematic and creative approach to data collection and provides comprehensive structure for coding by inductively deriving concepts from the data and also deductively hypothesizing relationships (Corbin & Strauss 2014). The strengths of a case study include a strong grounding in reality that enables cross-disciplinary analysis of professors' attitudes and understanding. However the results from case studies can often be limited for cross-institution comparisons.

### *Interview Subjects*

For this study, we interviewed professors across all divisions at Colorado College to investigate their understanding, attitudes and aspirations for incorporating sustainability into the academic program. The departments in this study represent all four major divisions at the college (humanities, natural sciences, social sciences and interdisciplinary). Faculty members were intentionally selected based on their interest and/or demonstrated experience in teaching courses that related to sustainability, though

the College had not formally identified such courses. All faculty members voluntarily participated in the survey and signed an IRB form prior to the interview. We removed professor names from all the interviews prior to analysis and replaced them with their respective departments to ensure their responses would remain confidential. Overall, our sample is not representative, but rather is consistent with the purposes of qualitative research (Patton 2002). These interviews established a collection of useful perspectives allowing us to construct a grounded theory related to our research concerns.

### *Data Collection*

Over a three-week period in December 2011, undergraduate students from an introductory Environmental Science course conducted 20-30 minute structured interviews asking academics eight pre-defined questions (Appendix A) that addressed the definitions, curricular topics, and values related to campus sustainability. Questions were structured to provide a ‘snapshot’ of current perspectives around sustainability across all disciplines. The use of a standard set of open-ended questions allowed the comparison of diverse perspectives across the disciplines. Although this methodology restricted interviews from being tailored to specific departments, themes from the qualitative responses could be effectively coded.

The introductory class decided that it would be appropriate for this project to use a modified version of the historical Bruntland definition that was less human-centered and stated that sustainability is ‘development that meets the needs of the present while maintaining a healthy economy, society, and environment without compromising the livelihood of other species and future generations’ and allowed faculty interviewees to comment on whether they accepted this framework (WCED 1987). Subsequent interview

questions fit into the following categories: a) formal ways to integrate sustainability into the curriculum, b) personal commitment to sustainability and c) ways to more effectively promote campus sustainability. Overall, our goal was to understand faculty members' perspectives about the formal administrative structure that enhance or obstruct the development of sustainability education.

### *Data Analysis and Interpretation*

Initially, open coding of transcribed interviews established relevant patterns of more than 100 identified open codes related to our research concerns. Following the classification of open codes, we reorganized our categories into more than 30 axial codes or broad theoretical constructs (Corbin & Strauss 2014). (Appendix C) The next step was to organize the codes through selective coding. This process grouped the distinct codes identified in the interviews into four broad themes. A theme book comprised of recurring ideas was used to re-analyze the interview transcriptions and affirm validity of the categorical designations. (Appendix D) Two current students, Fiona Haslett and Kyra Wolf worked independently to identify themes and then compared them to create a final list. To minimize bias we used relevant responses from all faculty members. Data from interviews were triangulated with public college policy documents about sustainability from the College and observations from professors involved in the sustainability dialogue on campus. In addition, Howard Drossman, professor in the Environmental Program, reviewed the open codes to assess the validity of the themes that emerged throughout the interviews.

## **RESULTS:**

After developing themes from the selective codes, we drafted three hypotheses to articulate the theoretical constructs created by the relevant codes. We presented all quotes verbatim with minor grammatical alterations to improve clarity.

*Hypothesis 1: A liberal arts education should transition away from teaching within disciplines and establish curricula structured around the process of learning, the development of skills, and the acquisition of knowledge through transdisciplinary topics.*

EfS must defy traditional educational paradigms and re-envision new models of teaching and learning to generate knowledge, reconstruct academic disciplines and address the complex, dynamic and uncertain nature of sustainability. As Steiner (2006) comments, objective knowledge must be combined with knowledge from different disciplines to increase the power of expression and understanding. During the analysis of interviews, two broad curricular topics emerged illuminating that EfS requires a flexible approach that focuses on the process of learning and the acquisition of skills while integrating a transdisciplinary curriculum. A successful liberal arts institution must prepare empowered, responsible citizens by addressing sustainability as a complex interdisciplinary concept that requires a dynamic interpretation. “A genuine liberal arts education will foster a sense of urgency to create a better society through connection, implicatedness, ecological citizenship and competence to act on this knowledge” (Orr 1992, p. 276).

*Transdisciplinary Approach:*

Four academic divisions (e.g. Natural Science, Social Science, Humanities and Interdisciplinary) create the academic framework of Colorado College. However, in its recent strategic plan, faculty members have recognized the need to eliminate divisional boundaries and establish a transdisciplinary plan. Although many academics critique an interdisciplinary teaching approach and emphasize teaching undergraduates with a more structured approach, most major problems exist beyond the frameworks of individual disciplines.

A transdisciplinary curriculum evokes a flexible approach to learning that integrates knowledge from numerous disciplines and embeds streams of knowledge into one another (Blattel-Mink *et al.* 2005; Sipos *et al.* 2007). Transdisciplinary courses stretch beyond interdisciplinary boundaries to create new boundaries and opportunities for exploration (Rowe 2002). The success of these courses comes from incorporating relevant real-world problems and actors (Steiner 2006). Professors incorporating transdisciplinary topics must be willing to learn in relation to other disciplines and source knowledge between, across and beyond disciplines (Stolpa 2004; Nicolescu 2014). In an interview, a professor in the Humanities Division outlined a course about “The West.”

They say,

This course would incorporate topics of aridity, water management, and poetic language. We could also make the class more pertinent to current topics by collaborating with someone in the Environmental Science or Geology Department.

Along the same lines, a professor who teaches in the Interdisciplinary Division commented on a transdisciplinary class structured around water management.

This class, called *Rio Grande* would follow the entire river from the headwaters while studying conservation, sustainability, farming, food production and economic development.

The transdisciplinary courses outlined by professors raise a question about the efficacy of integrating an interdisciplinary teaching approach in a liberal arts education. In response to this idea, several academics including Moore (2005), Nikitina (2005), Thomas (2009), and Feng (2012), believe disciplinary divisions represent knowledge characterized by a bounded way of understanding the world that cannot effectively capture the complex nature of sustainability. In addition, some faculty members raise the question, “Do disciplinary boundaries choke creativity or are they necessary to maintain order and structure within a large organization?” (Moore 2005b, p. 543)

Colorado College professors shared similar perspectives to those in the literature. One Natural Science professor raised the idea of the “Environmental Program picking one [transdisciplinary] issue like climate change for the year and devoting all classes to that one topic in order to assess the challenge from multiple perspectives”. This same professor emphasized that “students would become far more engaged in their own learning if they were asked to delve deeper into a certain topic”.

### *Honoring the process of learning and acquisition of skills*

In a liberal arts education, learning how to learn through mastery of critical thinking, problem solving, and written skills is just as important as the mastery of facts. Professors can prioritize the process of learning through an inquiry-based approach to learning. A professor in the Social Sciences Division reflects this idea,

Students must be equipped with a diverse set of skills to create a greater awareness about the complexities and uncertainties that exist around sustainability. These skills include an ability to contextualize and think about social problems.

Critical thinking and learning how to ask good questions are skills sets that honor the process of learning and encourage students to analyze and reflect upon new ideas (Sipos *et al.* 2007; Moore 2005; Orr 1992). A commitment to critical thinking empowers students to take ownership for their education and actively identify ways to create a better society (Rowe 2002). A professor from the Natural Science Division identified that “critical thinking allows students to recognize themes and see the complexity of systems.”

Systems thinking represents another important skill set for EfS. This holistic approach to learning draws on the use of complex theories and an ecosystem approach to recognize that separate activities from many interdependent social, economic, and ecological systems revolve around a unified complex global system (Sipos *et al.* 2007). Throughout the interviews, professors alluded to the importance of teaching topics through multifaceted perspectives. A professor from the Natural Science Division remarked,

We need to spend a lot of time looking at the ecosystem approach to the local environment...we need to address questions of how does the system work? What are the roles of various components are playing and how do humans affect these?

The themes prominent in the Natural Sciences about how individual actions fit into the framework of larger consequences parallel the Social Sciences perspective on system thinking.

[Social Science Professor] doesn't like to think in terms of individuals—because our impact is determined by the social systems that we're embedded in—food production systems, transportation systems, the housing style, the design of cities, all of these are global production processes.

Another professor from the Natural Science Division alluded to Steiner's (2010) paradox of addressing sustainability in education.

Sustainability can't be a single topic in a course because different contexts of all of these different components need to be discussed in various viewpoints. How do we see it ecologically? How do geologists, hydrologists, and resource managers see extraction? How do the biologists see utilization of resources in an agricultural context? Within different disciplines it's highly useful to talk about the difference of scale and timeframe.

Overall, addressing sustainability requires a shift away from traditional educational processes and requires an interdisciplinary point of view, transdisciplinary problem-solving processes, and specific interpersonal skills. Teachers must integrate curricular topics beyond the memorization of facts and relinquish the role of teachers as experts and instead create the space to establish a participatory environment for collaboration and cooperation (Steiner 2006).

*Hypothesis 2: An effective liberal arts education creates a context for student learning that honors the affective domain and fosters opportunities to develop individual values, attitudes and passions.*

Another major theme that emerged from the interviews was the value of evoking personal values and integrating individual feelings into the generation of knowledge with individual feelings. This approach to teaching fosters an increased interest, enjoyment and excitement for learning and at the same time integrates a sense of place as well as beauty, respect, reverence and awe regarding the environment. Honoring the affective domain bridges the gap between knowledge and action (Littledyke 2008). The values portrayed in EfS set the framework for and influence decisions about the relationship

with the biophysical environment (Dietz 2005). Many educators believe the purpose of education is to prepare students to be agents of change. A Social Science professor articulates this idea:

[My department] tries to give [students] lenses on the world that give them insight and empower them to be agents of change...[We] give them insights into how things are structured, why things are as they are, and how we can apply pressure and insert strategies.... My goal is to empower agents of change... [I] hope that people come away with that sort of sense of empowerment or at least a little bit more precise weaponry to engage this issue.

Although some teachers fear that EfS can be a form of indoctrination, a primary role for professors is to allow students to find their place in relation to the world around them.

I try to leave it up to the students to come to their own conclusions because professors often insert their own biases and value judgments way too quickly into the whole area of sustainability, and I worry that students at Colorado College aren't really getting a fair and sober view of the whole arena; rather they are getting biases of whoever is teaching a particular topic or whatever their personal values or opinions may be. So I usually hesitate to give away my own personal views because I think that stifles students. (Humanities Professor)

Many Colorado College professors approach teaching EfS by illuminating the theme of human connection in two perspectives: a connection with themselves and a relationship with the greater world. A Natural Science professor identifies this theme in an interview:

We are trying to get people to have this feeling of closer connection. That's what I would more define as a component of sustainability that is usually missed in other courses... If we're really going to get to sustainability, it is not going to be technological in its innovation; it's a critical mass of people that actually change their opinions and they change their connection to nature... [sustainability] is looking at people's connections in nature, why they are connected, looking at nature as more than just going out to the forest, looking at everything in nature.

Other faculty members at Colorado College commented on a trend found in the literature about addressing EfS through 'feeling a closer connection' to people and the world. A member of the Humanities Division commented on the importance of understanding students' personal relationships with the world:

I suspect that as people reflect on [living sustainably] they will think on ways that they use [relationships] in their teaching because part of... almost every tradition has some way of understanding our relationship to the world.

In other literature, the idea of educators infusing themes of values, behaviors, and attitudinal changes into science education is becoming more prominent (Kostoulas-Makrakis 2010). This shift of consciousness toward appreciating ones-self, relationships with others and the natural world raises the important question of *what education is for?* The educational opportunities structured around honest self-reflection and understanding relationships with the world represents a critical awareness toward transformative education.

### *Transformative Education*

Transformative education challenges the traditional paradigm of transferring knowledge from professors to undergraduate students and represents a shift from “instructivism to constructivism” (Kostoulas-Makrakis 2010, p.17). This change asks professors to relinquish subject-oriented learning that often results in a mastery of material and instead constructs knowledge through individual and social experiences (Moore 2005a). As Cranton (1996) outlines, transformative education requires educators to become equal participants in the classroom and feel vulnerable as a teacher. Through critical self-reflection, transformative learning strives to alter traditional perspectives and habits to develop new values, concepts, and feelings that lead to a heightened sense of self-awareness. A Natural Science professor acknowledges that “the focus of EfS is not so much about the systems or technical approach, it’s more about the people approach looking at the feeling and the awareness side of sustainability that are generally ignored.”

Illuminating the affective domain of EfS also raises the question of power and the role of hierarchy that pervades the relationship between humans and the environment. “In talking about the representation of nature and societies, it’s important to discuss the social interactions and social structures of power” (Humanities Division Professor). A Social Science professor identified that “the discourse [that] sustainability lacks is this notion of power and how power dynamics and the hierarchy of dynamics actually infuse outcomes in the name of sustainability.”

In addition to power, professors commented on the importance of including elements of reflections, relationships and emotions into the curriculum; however, it is interesting to acknowledge the limited discussion of a pedagogical shift. Although the interviewees spoke about themes integrated into transformative education, none of the interviews used the terminology of transformative education. The interview responses raise a similar question to Moore (2005): is higher education ready to fully embrace the practice of transformational education and relinquish the role of professor as the primary wealth of knowledge?

*Hypothesis 3: A liberal arts education should prioritize a process of learning that includes active participation and an inquiry based approach to develop students to become leaders and agents of change.*

In the last decade, student initiatives have catalyzed many of the sustainability projects at Colorado College. Student proposals cultivated projects such as the student farm, sustainable living communities, the bike sharing program and Earth Week. In fact, the original Sustainability Action Plan drafted in 2010 came from a senior thesis that was

adapted and presented to the Board of Trustees. Currently, most of the informal co-curricular sustainability efforts are students overseen by the Campus Sustainability Manager.

The extracurricular opportunities that thrive at Colorado College and at most liberal arts institutions form the “disciplinary bridge” for additional learning experiences. Informal education prepares students for a life of action by formulating learning opportunities that transcend disciplines (Lipscombe 2007). Many of these informal initiatives successfully bridge academic content, administrative policies and facilities management (Koester *et al.* 2006). Informal educational opportunities instill in students an interest in public life and ignite enthusiasm for exploring specific issues (Warwick 2007). This spark for action comes in many forms within the Colorado College community.

Learning how to enact change doesn't always have to be pressing the Obama administration... we can think about how we can press the key decision makers at the College and change the organization (Social Science Professor)

This perception to create leadership opportunities, ask challenging questions, and extend learning opportunities beyond the classroom often complements more formal learning experiences in higher education. As Lipscombe (2007) recalls, “sustainability related work may not be academic or in learning and teaching roles... being free from the constraints of the curriculum may also provide a space for creativity and the emergence of new approaches to teaching and learning” (in Hopkinson 2008, p. 439).

Despite the perceived positive momentum about informal educational opportunities found in the literature, the faculty members interviewed at Colorado College did not share the same sentiment to extracurricular learning opportunities. In looking at the number of codes that focus around informal learning, it is apparent that the

current channels of communication between faculty and informal learning opportunities are inadequate.

Over time, Colorado College has struggled to maintain an effective institutional approach toward sustainability. In the last five years, the faculty mentorship of student clubs and electives on campus has transitioned to become centralized under the guidance of the Campus Sustainability Manager. This transfer of leadership has removed faculty involvement in these efforts. Is it possible that this flux in leadership, funding, and reporting has decreased the potential learning opportunities for students? Or is it possible that this shift has increased student autonomy and the opportunity for leadership?

At Colorado College today, the faculty continues to have a limited understanding about the informal learning opportunities that exist across campus. Many attribute their lack of knowledge to ineffective channels of communication.

I really don't know what we're doing as a campus. The cool water fountains that will refill your water bottles...I like those...But I don't see a lot of solar panels around, maybe there are some. It seems like the campus is all right, but I don't notice a lot of stuff going on. (Humanities Division Professor)

Over ten of these interviews focused on the limitations of campus facilities such as recycling systems and paper use. In the following quotation, a professor from the Natural Science Division identified the construction of new buildings on campus as an important reflection of sustainability efforts,

I guess I'm not necessarily aware of a lot of the other [sustainability programs besides recycling] that's being done. I know that [the newest science building] was designed to be more or less sustainable or energy efficient or whatever, and that's true of some of the newer buildings, but I'm not aware of a lot of the details on those programs.

In other interviews, two prominent themes about the informal academic structure were identified: the campus used for experiments, and relationships with alumni.

*(1) Campus used experimentally as a learning laboratory*

As apparent in the AASHE Stars metric and in the Savanick (2008) study, the Colorado College campus could be used more deliberately as a learning laboratory to integrate informal projects into the formal curriculum. While some classes in the Environmental Program structure final projects around campus sustainability projects, more classes could use this model. Faculty members have identified numerous opportunities for Colorado College to be used as a learning laboratory to test new solutions.

One of the best things Colorado College can do to address sustainability is figure out solutions and try to put them into action...I would like to see the campus used experimentally.” (Social Science Professor)

Transdisciplinary topics like campus recycling, waste management, energy use, landscape patterns, and food consumption create optimal opportunities for student involvement and ownership.

As Savanick (from Macalester College) acknowledges, campus sustainability projects are a unique opportunity to explicitly link and supplement campus operations with an academic mission. These plans create a cohesive institutional approach to sustainability. The success of these campus sustainability projects relies on four pillars: effective institutional accountability, institutional communication structures, community engagement and thorough communication structures, and most importantly, institutional funding mechanisms (Savanick *et al.* 2008).

At Colorado College, the Campus Sustainability Manager serves as a representative to generate meaningful learning opportunities through collaboration with campus operations, student groups, and the academic program. Faculty members have commented on how small changes such as educational signage and energy monitoring

can drastically improve channels of communication and bring disparate groups on campus together. As a Natural Science professor recalled in an interview,

A big problem with the campus is that we had no energy metering in many of our buildings...we are guessing as to what our gains are. With the help of the campus energy manager, every major building on campus now has its own thermal meter and electrical meter and we have the dashboards up so that people can actually see those, so we are making really good strides.

Landscape patterns across campus have been an area of significant discussion at Colorado College. Throughout the interviews, numerous professors identified that altering landscapes to minimize water consumption (xeriscaping) creates a valuable learning opportunity within the intersection of science and policy. Today, many students are collaborating with campus groups to transform the landscape to honor the Southwestern environment. During the interviews, two professors affirmed the importance of landscaping and recognized Colorado College as a leader in this practice.

...one thing that really stands out [in terms of sustainability on campus] is the component of the landscaping at CC; the plants and lots of adaptive plants is strong compared to other colleges and universities. (Natural Science Professor)

In many ways, the physical infrastructure of the campus serves as a model for community engagement, communicates the institutional values and attitudes of the campus community, and provides a clear signal to the community about the College's commitment to sustainability. Many students and faculty believe that Colorado College can serve as a model for the greater Colorado Springs Community. A social science professor articulates this claim by saying,

If the landscaping were more in harmony with the physical environment in which we live, that would probably be a good step for the College to take.

If faculty can effectively integrate tangible projects that require substantive change, campus sustainability efforts can shift away from hypothetical ideas and enact holistic commitments to campus sustainability (Hopkinson 2008; Savanick *et al.* 2008).

## *(2) Integrating Alumni Networks to Create Internships*

Beyond establishing tangible campus projects, many professors identified the benefits of creating an internship program to connect current students with local alumni working in the sustainability sector. Many professors identified that the breadth and diversity of their alumni connections were limited by the confines of their academic disciplines. A professor from the Natural Science Division reflected,

We have a lot of alumni who do really excellent work in sustainability projects and they work in areas related to the goals of sustainability education. If we could better connect our students with what our alumni are doing, I think that would bring Colorado College a bit closer to integrating sustainability into the curriculum. (Natural Science Professor).

This gap in communication provides an ideal opportunity for the Campus Sustainability Manager to create “disciplinary and community bridges” and serve as the interface between the curriculum and campus community to work beyond the confines of academic disciplines (Lipscombe 2007).

In numerous interviews, faculty members identified the value and potential opportunities that exist in supporting these programs. Here is one anecdote from a Social Science professor,

We have a lot of alums engaged in sustainability and I think it’s time to either put up or shut up. We either engage with them or start to buy into informal curriculum or we are going to give lies that we are really into sustainability.

Overall, as Lipscombe (2007) and Savanick *et al.* (2008) and others have emphasized, valuable opportunities exist within the informal curriculum to integrate disciplines and to create learning experiences that reflect the purpose of a liberal arts education and catalyze future leaders and agents of change.

## DISCUSSION

*How can the formal administrative structure better align to incorporate EfS?*

From this study, it is apparent that the three themes: generation of knowledge, values awareness, and active learning opportunities promote EfS. How are these three themes identified within the formal administrative structures of liberal arts institutions like Colorado College? Though these themes translate from professors' interview perspectives, they do not inform how the formal administrative structures might better align to more effectively incorporate EfS. As members of campus communities look to holistically transform their campus, leaders and planners need to identify, respond to the elements of the institution that limit communication, and identify ways to transform the formal administrative structures to align and support campus sustainability.

As Creiton and Keniry (both cited in Savanick *et al.* 2008) remark, campus management plans are often structured around deeply embedded cultural priorities and values. It is challenging for institutions to properly communicate their new vision. A Natural Science professor outlined, “trying to enhance the communication between the different parties so [all parties] know what’s going on is the most important thing.” Similar to the suggestions of Luhmann (1995) for environmental issues in general, the lack of shared understanding and language within an institution can often create incongruent efforts lacking support and motivation. A professor from the Humanities Division remarks, “there is still some inertia [preventing incorporation of sustainability in curriculum] ... these are not my teaching interests or these aren’t my scholarly interests, so I am not going in that direction.” Campus sustainability plans require a commitment to deliberate channels of communication and organizational learning that enact change through pluralistic perspectives, collaboration, and dialogue. A commitment to

organizational learning requires professors to expose their lack of expertise and pledge to integrate new themes.

I worry about non-experts teaching about something that actually does require real understanding. [Sustainability] is worth bringing up. [Sustainability] is something that we should all be thinking about... but I wouldn't want to focus on [sustainability] in a class... I think that would be a disservice to the students to pretend to be an expert about something that I'm not. (Humanities Professor)

In reality, professors' lack of expertise and the concomitant need for organizational learning provides an example of transformative methodology. This process of change is not efficient and often is challenging to catalyze; however, the value of including all voices leads to lasting changes.

Over the last decade, Colorado College has prioritized sustainability across campus and in the curriculum by striving to establish more methodical channels of communication. Campus sustainability initiatives are most frequently attributed to three groups: Academics, the Campus Sustainability Council (CSC), and Facilities.

These three administrative structures reflect Sipos' (2007) organizing principle to integrate transdisciplinary study (head), translate values into behavior (heart), and develop practical skills (hands). Within the context of Colorado College, the academic structure of sustainability focuses on behavioral changes, the generation of knowledge, and the complexities of sustainability. The CSC serves as the glue for the campus and sets values and expectations to keep the campus sustainability movement cohesive by forming connections and identifying meaningful channels of communication between the faculty, students and staff. The CSC strives to prioritize projects and initiatives that reflect an ethic of environmental stewardship. Finally, Facilities provides the potential for students to use their hands, extend the boundary of the classroom, and delve into

active learning experiences through technical concepts related to energy production and conservation.

At Colorado College, all three groups report to the President of the College through various channels (Appendix B). Although the current Colorado College President prioritizes sustainability efforts as part of providing “the finest liberal arts education” (Colorado College’s Mission statement), in what ways might sustainability reporting structures be better aligned to support sustainability?

### *Academic Structure of Sustainability*

Teaching and learning stands at the core of any liberal arts institution. Today, the academic structure of sustainability illuminates “the mind” to the multidimensional complexities of EfS. Under the leadership of the Campus Sustainability Manager, the Office of Sustainability stands in a powerful position to establish transdisciplinary learning opportunities that are unbounded by disciplinary identities and are filled with innovation. The Office of Sustainability prepares students to develop the skills needed to assess and solve complicated problems with various stakeholders and priorities.

The Office of Sustainability strives to foster communication, collaboration and coordination between the sustainability stakeholders in the Colorado College community. The Manager oversees a group of paid student interns who work to support campus initiatives and collaborate directly with the CSC and other student environmental groups to make the College a model for campus and community sustainability.

In 2014, the Office of Sustainability at Colorado College published the *2014 State of Sustainability* around the assessment metric of the AASHE STARS. As evident from this publication,

Colorado College is fully committed to sustainability. Outlined in the mission and core values, sustainability isn't optional for the Colorado College Community; it is who we are and how we have defined ourselves. We aspire to make Colorado College a model for campus and community sustainability-an academic village that instantiates a commitment to a sustainable and desirable future not only for the human economy, but for the larger ecosystem in which is embedded (p. 3).

The Manager plays an important role in organizing the administrative logistics and helping facilitate the Campus Sustainability Council along with the three co-chairs, but the Manager does not serve as a co-chair. This structure allows other faculty and staff to take leadership roles on sustainability initiatives. Although the Manager is not a faculty member, he reports to the Associate Dean of Faculty about projects that involve integrating sustainability into the curriculum. The Associate Dean of Faculty then reports to the Dean of the College who reports to the President of the College (Appendix B).

At Colorado College, the position of the Manager has shifted the priority of sustainability beyond Facilities and into academics by establishing a definition for sustainability in the curriculum, working to establish a sustainability designation for courses, and collaborating with departments and faculty members to help them add themes of sustainability into their existing courses while also creating new sustainability courses. Beyond curricular topics, the Manager can also look outside the formal academic curricula to extend sustainability initiatives into the local community. These efforts could include working closely with the Collaborative for Civic Engagement, identifying strategies for the campus to become more involved in local investments and businesses.

Most importantly, the Manager, in collaboration with Facilities, should address the traditional disciplinary silos and enhance communication between Facilities and faculty members. Communication and relationships between these groups could become stronger if the Manager worked with a student intern or a group of faculty members to

develop a list of potential realistic final projects and questions that various classes from all disciplines could investigate to bridge the gap between facilities, faculty and the formal curriculum.

It can be challenging for the Manager to enact curricular change without serving as a faculty member. Currently, a large hurdle exists to comprehensively understand the sentiments of faculty members in response to integrating sustainability topics. In some ways, this study provides one place to catalyze that conversation. In looking ahead, it will be critical for the Dean of Faculty to support the Manager more directly when presenting new ideas to the faculty.

As we look into the future, the relationships that develop between the Manager and the faculty will be imperative to create an institutional commitment to sustainability that extends beyond Facilities and can be integrated into the fabric of the curriculum. One way to catalyze these relationships might be to create a series of round table discussions with presentations from Facilities and other avenues of sustainability in order to engage the faculty. Finally, another important component for the Office of Sustainability is to connect graduates who are agents of change with students, so that the students can learn and understand the complexities and skills required to address sustainability.

Overall, the Campus Sustainability Manager strives to synthesize the numerous detached sustainability projects that are taking place on campus and unite them into a cohesive movement. Since the inception of this position, a new office has transformed into a dynamic place buzzing with student involvement and providing a structure for future growth.

### *Campus Sustainability Council Structure*

The set of values, or the “heart” of sustainability, as identified in professor interviews, parallels the structure and vision of the Campus Sustainability Council. In the same way that topics of sustainability evoke a sense of purpose and connection to the world, the CSC also strives to unite various voices on campus to form a cohesive ethic of sustainability.

The CSC serves as an advisory committee appointed by the President of the College and strives to promote and implement initiatives that are ecologically viable, economically sound, and socially just. In its mission, the CSC hopes to make Colorado College a model for campus and community sustainability and strives to raise awareness on campus about energy efficiency, waste reduction, community conservation, long-range planning and civic responsibility. In 2012, the CSC chose the AASHE STARS metric as a way to assess, measure, and streamline the current sustainability efforts. In the last year, in response to the AASHE STAR divisions, the Council has divided into four working groups: engagement, academics, policy and operations. This group of 50 members comprised of faculty, students and staff serves as an open forum for the entire community, and meets once a block to advance strategies for carbon neutrality, to report on campus auditing and to expand community collaboration efforts for sustainability. This group also has an annual operating budget of \$50,000 to fund innovative and measurable projects to promote and pursue sustainability on campus.

One way that the CSC could be more effective and prominent on campus is to coordinate and centralize efforts more deliberately with other campus committees and groups to provide strategies to meet the goals of the Colorado College Sustainability Plan. Last year a group of faculty, students, and staff, many of whom also sit on the CSC,

were appointed by the President of the College to create the Sustainability Knowledge Development Team. This group was charged to work for one year to assess the recent advances of sustainability initiatives in order to set the agenda for future sustainability projects. This additional committee generated tremendous energy and gathered pertinent information throughout the year, but would it have been possible to restructure the current CSC to make it equipped to take on the challenge? Did an ineffective structure of sustainability management cause redundancy and ineffectiveness with this new committee? One way to integrate these two committees would be to establish a comprehensive five-year plan outlining ways to incorporate the information collected by last year's committee into the agenda of the CSC's academic working group. Striving to ensure continuity between projects continues to be a challenge for sustainability efforts in all areas of campus.

#### *Campus Facilities Structure of Sustainability*

The Facilities structure of sustainability at Colorado College creates the “disciplinary bridge” and instills an interest in public life through hands-on active learning. Bolstering partnerships between academics and Facilities creates opportunities for students to add tangible-real life applications to their studies. Would it be possible for an Energy Class in the Environmental Program to structure their final project around an audit of the current campus power plant? Using the campus as a learning laboratory creates an avenue for students to ask questions, and empowers students to enact change within a manageable scale. The set of skills learned would be applicable to life after college. With this set of skills, students can then transfer this knowledge and apply these concepts to life after college. In collaborating with the Campus Energy Manager, students

could apprentice with Facilities and learn ways to integrate energy management into their studies.

Currently, the Campus Energy Manager is responsible for the development and management of energy operations and is committed to stewardship excellence relating to campus energy consumption, efficiency and conservation. The priority of this position is to promote energy conservation and minimize utility costs through measurement and effective communication, while supporting the College's sustainability goals, core values, and commitment to carbon neutrality by 2020. This position reports to the Director of Facilities who strives to collaborate with the College community to ensure the finest academic living and working environment possible. The Director of Facilities reports to the Vice-President of Business, who reports directly to the President of the College.

The development of the Campus Energy Manager position brought the abstract goal of achieving carbon neutrality by 2020 to life through realistic and tangible goals and actions. The current challenge that exists at Colorado College is to ensure that the Campus Energy Manager effectively shares current projects with the entire campus community. At the moment, the Campus Sustainability Manager and Campus Energy Manager attend weekly Facilities meetings and monthly CSC meetings to share the latest updates; however, there is not a clear mechanism for sharing this information with the entire campus. Creating a blog or email newsletter about current Facilities' plans that could be shared with the campus community would enhance and promote conversations about the importance of campus sustainable energy initiatives.

In addition, another opportunity for student engagement in partnership with Facilities would be to have an intern work to communicate the efforts from the Campus Energy Manager. Currently, there is an intern working in the Office of Sustainability as

the Greenhouse Gas Inventory Intern. Could there be a way to restructure this position under the guidance of the Campus Energy Manager to bridge these two departments? This position would create opportunities for students to learn more about energy conservation on campus, share current projects and other information with the community, and develop skills to become an energy manager post graduation.

The academic structures, the CSC, and Facilities all play an important role in grounding sustainability within the formal structure of the administration; however, real successes and advances occur when these three areas collaborate and bring sustainability issues to the forefront of the campus community. In many ways, the themes embedded in the professors' interviews can be integrated into the formal administrative structure to prioritize EfS. Identifying these parallels within the academic and administrative structure represents the first step to creating a comprehensive institutional approach to sustainability on campus and in the community.

*Recommendations:*

This case study analyzes current faculty perspectives about integrating sustainability into the College's institutional identity. From these perspectives, I propose several concrete recommendations for the campus and curriculum. In addition, a future follow up series of interviews with specific faculty would contribute a depth of ideas present in this study and illuminate current areas of strength and improvement.

(Appendix E)

Overall, Colorado College must find ways to align "individual practices with institutional practices" through defining the College's decision making structure to establish consistent values and guidelines (Schild 2010 p. 62). It is critical to establish a

definitive framework for sustainability at Colorado College. Although the plans and priorities might not align with everyone's values, this list of priority actions will inspire critical change for sustainability at Colorado College.

- 1.) *Evaluate and measure the integration of EfS into the curriculum across all disciplines.* This recommendation includes a college-wide sustainability designation and also includes a commitment from professors to assess their curricular topics and pedagogy and to share them with the rest of the community. This recommendation asks professors to evaluate how their teaching incorporates sustainability. EfS creates a powerful opportunity for faculty and staff to collaborate and incorporate the cognitive, affective and psychomotor domains of learning into the curriculum.
  
- 2.) *Foster informal education opportunities within the context of formal learning opportunities.* Spark relationships between faculty and staff through a series of professional development workshops with presentations by staff members about potential campus and community projects that could be incorporated into the Block Plan. In addition, create orientation programs to introduce sustainability initiatives to new students, faculty, and staff.
  
- 3.) *Improve channels of communication through collaboration with campus leaders and sustainability stakeholders.* Enhance the inclusivity of the sustainability movement through improved networks and leadership to increase transparency of the decision making process. This includes updating

the Office of Sustainability website and improving the web presence of sustainability efforts through networking technologies to promote collaboration across campus.

## CONCLUSION

The findings of this study suggest that an education rooted in addressing complicated issues such as sustainability across all disciplines requires a whole-system approach where professors engage the head, heart and hands in diverse and creative ways of teaching and learning. EfS requires more than a commitment to operational efficiency, reducing consumption or hiring a Campus Sustainability Manager; it asks educators to transform the traditional paradigm of teaching and learning to embrace an approach of education that honors the knowledge, values and behaviors of the individual. Broadly, the purpose of this study was to understand the attitudes of Colorado College faculty members' perspectives on issues of campus sustainability and in the curriculum. In addition, the study worked to outline areas of strength and potential areas for growth. The themes generated through faculty interviews: curricular topics, awareness of values, and active learning, can set a framework for the formal administrative structure of the College to address sustainability issues by exposing areas for enhanced communication.

After this study, a number of questions remain unanswered and provide areas for future research. In particular, pedagogical techniques used to enhance EfS were not addressed in this paper. Although this study identifies honoring the process of learning through inquiry-based and transdisciplinary learning, it does not prescribe how to teach. Many interviews with faculty members exposed their feelings of limited expertise about sustainability. To address this underlying deficit, some professors suggested solutions that included team-teaching, transformative learning techniques, and ways to enhance collaboration with non-academic staff. In these workshops, staff members could provide missing expertise through existing or new workshops and/or by presenting to actual classes.

The learning outcomes defined in EfS parallel the learning outcomes present in a liberal arts education: a focus on the breadth of knowledge rather than the opportunity to develop skills particular to a profession. Just as the sustainability movement at Colorado College requires the collaboration and coordination of a strong grassroots movement sparked by student energy and supported by a deliberate institutional strategy, a commitment to the liberal arts also requires students' commitment to learning and to working with faculty and within formal administrative structures to ensure accountability and to set standards for legitimate final outcomes. Joining EfS with a liberal arts education synthesizes an abstract theoretical framework with tangible learning opportunities.

Both EfS and a liberal arts education ask educators to teach about topics through multidimensional perspectives. In addition, educators promote a process of learning that incorporates material derived from students' thinking. This commitment to adaptation prepares students to prioritize the process of learning and flexibly integrate sustainability. Furthermore, a liberal arts education also abandons the commitment to equip students with skills for specific jobs and instead establishes a framework to develop how to think. With a focus and commitment to strong teaching, critical thinking, and self expression, liberal arts educators prepare students through concise articulation of written and spoken thought.

As the Decade of Sustainability Education comes to a close, and academics and educators begin to redefine the vision for higher education, a collaboration with the liberal arts will not only promote education for sustainability, but will also erode the traditional "ivory tower" of education and create meaningful connections outside of the classroom. As Moore (2005) says, "the possibility to re-create and re-think higher

education is exciting, dangerous and ripe with possibility” (p. 89). Evoking themes of sustainability into the liberal arts education will prepare students to think deeply and identify ways to become active change makers in the world.

## APPENDIX A: Interview Schedule

Here is our definition of sustainability: the most common definition of sustainability comes from the 1987 UN Brundtland report “Our Common Future.” It defined sustainable developments as those that “meet present needs without compromising the ability of future generations to meet their needs.” In order to be less human-centered, our class shifted it to say, “Maintaining a healthy economy, society, and environment without compromising the livelihood of other species and future generations.”

- Do you agree with this definition?
- What can your discipline/program contribute to a full understanding of sustainability?
- Do you teach courses for which sustainability is a major or minor theme?
- Explain how these courses/this course teaches about sustainability.

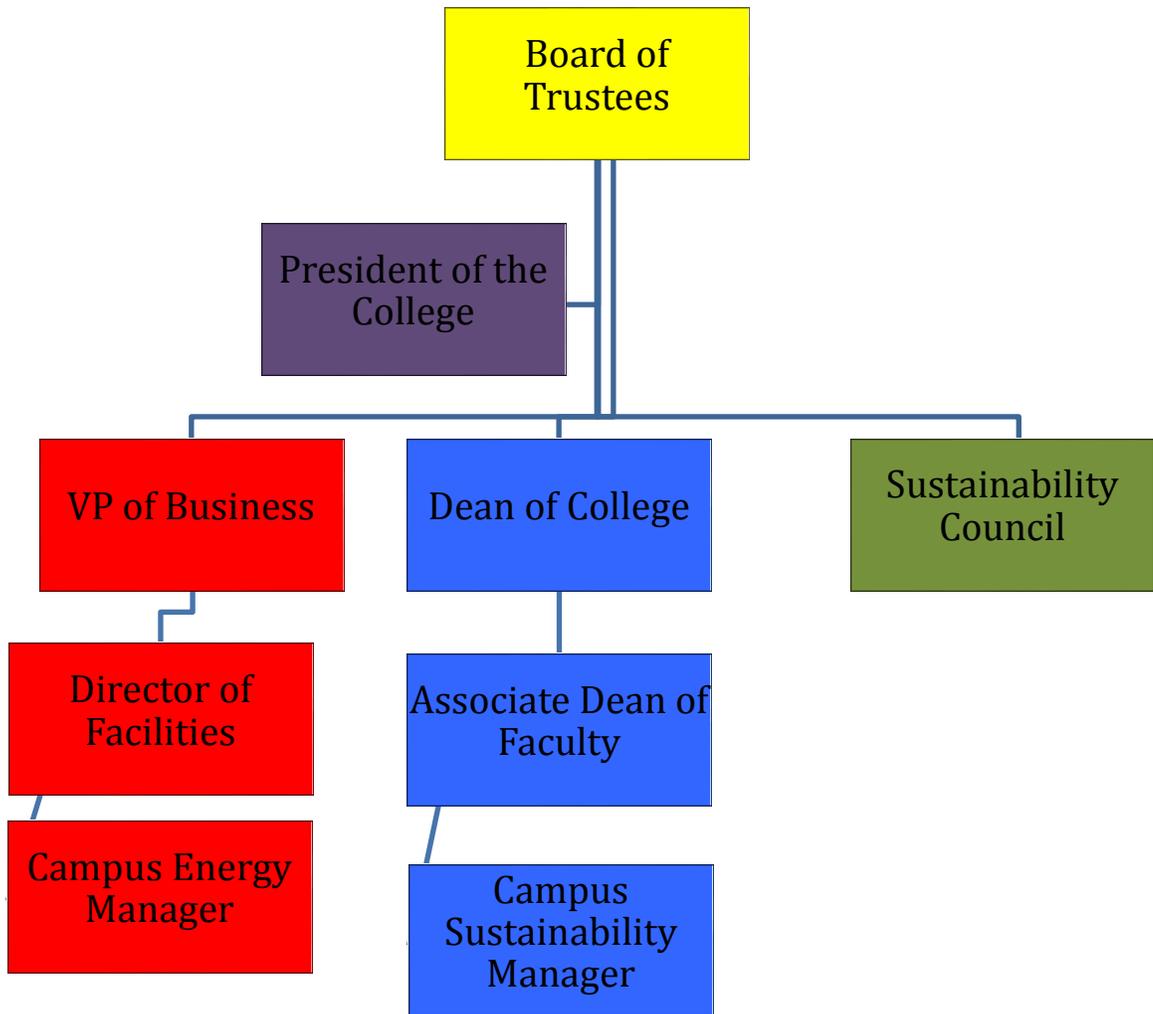
If answers are positive:

- How well do you think your department is addressing the issues of sustainability? What areas do you feel need the most improvement and how could they be fixed?
- What sustainability programs do you see on campus that you support or would like to support or would like to see more of?
- What is your role in promoting sustainability at Colorado College or in general?

If answers are negative:

- Do you feel this is an important issue?
- Within your department, do you think it is worthwhile/feasible to involve sustainability into your curriculum? What issues do you foresee arising?
- In what ways could you incorporate sustainability into the classes you teach?

APPENDIX B: Formal Administrative Structure of Sustainability



## APPENDIX C: Axial Codes

### **1. Definitions of Sustainability**

Agreement with the class definition of sustainability  
Class definition as standard definition of sustainability  
Sustainability definition used in classes that professors teach  
Many definitions for sustainability  
Sustainability as long-term or future-oriented definition  
Disagreement with class sustainability definition  
Unfamiliar with definition of sustainability  
Broad definition of sustainability  
No Personal definition  
Thinking beyond humans  
Sustainability representing minimal impact on environment  
Sustainability focused on planet rather than people and profit  
Conflicted ideas toward sustainability  
Triple Bottom Line (Economy, society and environment)  
Sustainability as healthy  
Sustainability is a difficult concept  
Sustainability as the brain's biases to serving the self

### **2. Departmental Views**

Geology related to Sustainability  
Sociology related to Sustainability  
Sustainability addressed in Psychology:  
EV department address sustainability?  
History as a way to study sustainability  
Philosophy's connection (or lack of) to sustainability  
Dance and Drama related to sustainability:  
Education Department Related to Sustainability:  
Political Science related to Sustainability:  
History Related to Sustainability:  
Philosophy related to Sustainability:  
Relationship between literature and sustainability:

### **3. Faculty**

Professor background in sustainability learning  
Conflict between literature and sustainability  
Faculty's personal commitment to sustainability  
First year professors encouraged only to teach:

Professors don't know about sustainability efforts on campus  
Faculty roles in promoting sustainability  
Faculty support for student sustainability initiatives  
Professor Interests in Sustainability Topics  
Faculty dissatisfaction with campus sustainability efforts:  
Aversion to teaching sustainability because not experts  
Faculty Disconnect in teaching sustainability topics:  
Placing the job of teaching sustainability on other professors  
Professors don't know what is taught in own department:

#### **4. Collaboration on Sustainability**

Sustainability is relatable to different subjects in many ways  
Collaboration between multiple departments to teach sustainability

#### **5. Sustainability Programs on Campus**

CC Farm as a sustainable project on campus:  
Sustainability Programs on Campus  
Politics of Student Groups on campus:  
Ways to improve sustainability initiatives on campus  
Bike Programs on Campus  
Limited clubs on campus focused on Sustainability  
Importance of student leadership/ involvement  
Positive Sustainability Programs on Campus:  
Visibility of sustainability initiatives on campus  
Student Faculty Collaboration in sustainability topics:  
Bringing in outside speakers with sustainability themes

#### **6. Student Views**

Student's problems with sustainable efforts on campus  
Student interest in environment/sustainability issues

#### **7. Materials/ Resources**

Recycling Program on Campus:  
Paper Consumption on Campus:  
Reusable Dishes on Campus:  
Limiting paper use to become more Sustainable

#### **8. Nature**

Achieving sustainability by connecting to nature  
Spirituality and sustainability  
Religious/Cultural traditions deal with sustainability ideas

Nature (sustainability) comes from within/ where they come from:  
Nature as a Commodity in literature

### **9. EV Program**

Ways the EV Department can improve:

Increased Interest in EV Major in recent years

High enrollment of EV classes:

EV Program prepares students for sustainability

Support for EV Program:

EV Internship Projects

Distinction within the EV Major for merit and service:

Attracting students to Sociology who become EV Majors

Sustainability Internships as Capstone Project:

### **10. Curriculum/ Teaching Sustainability**

Teaching students to be concerned about sustainability

Ways to support understanding of Sustainability

Course examples of sustainability

Current limitations in Curriculum

Do you touch on sustainability in your classes?

Issues in incorporating sustainability into curriculum

Ways to expand sustainability curriculum

Main focus of teaching/research is not on sustainability

Hesitation about curriculum relationship to sustainability

Challenges in teaching sustainability

Sustainability as Major Theme in classes

Different iterations of the same class aren't the same

Projects in classes about sustainability

Manner of teaching as important as topics

Relevant Content in the curriculum not directly focused on sustainability

Value on Sustainability Education for itself

Research Opportunities within curriculum focused around sustainability

Sustainability Major Requirement:

Practical challenges to expanding sustainability curriculum

7's philosophy of sustainability curriculum

### **11. Alumni**

Graduates pursuing a career in sustainability fields

Other fields EV Graduates choose:

Alumni Connections

## **12. Systems**

System approach to teaching sustainability

Using virtue systematically to achieve sustainability:

Need for System approach versus individual action to sustainability

## **13. Governance and Policy**

Policy Making focused on sustainability

Governance of Sustainability on campus

Disconnect between natural science and policy:

## **14. Sense of Place**

Sense of Place

Southwest Region Related to Sustainability

Native American relates to Sustainability:

Sustainability relationship to space:

## **15. Society**

Environmental Footprint determined by social systems

Social Mechanisms affecting sustainability

Social inequality connected to Sustainability:

Global Inequality connected to sustainability:

Power dynamics related to Sustainability:

Social and environmental sustainability:

Human impact on the environment

People/Feelings focus toward sustainability

Native and Modern American perspectives of Sustainability:

## **16. Ethics**

Individual versus collective responsibility

Ethics of sustainability

Overall ethic of sustainability

## **17. Resources**

Fracking in Sustainability

Resource Management in Sustainability

Natural Capital in Sustainability:

## **18. Food/Agriculture**

Food issues/ agriculture as a focus in Sustainability

## **19. Financial Resources/ Economy**

Green Investment Division of Endowment:

Lack of resources directed toward sustainability efforts

Economy opposing social sustainability

Corporation's effect in sustainability

Incentives to act sustainably are not effective

Role of Government/ Economy in Sustainability

## **20. Culture**

Break away from the throwaway culture:

Understanding the materiality of culture:

Create a culture of sustainability

Issues of identity in relation to culture and sustainability

## **21. Projects/ Field Work**

Debate about fieldwork and transportation:

Direct connection through field work

## **22. Landscape/Built Environment**

Campus landscape improvements for Sustainability

Future sustainable building projects:

## **23. Optimism/ Positivity**

Establishing an upbeat approach toward sustainability:

Role of Optimism in sustainability

## **24. Motivation**

Motivation to pursue sustainability

## **25. Climate Change**

Concern about climate change in sustainability

## **26. Energy**

Energy Focus in Sustainability

Problems with building energy consumption

## **27. Colorado Springs Community**

Use Colorado College to practice ways to enact change on larger scale

Public Events in Sustainability

CC Influence on Colorado Springs Community:

Educational possibilities in community

### **28. Misperceptions**

Misperception can be damaging to environment

Misperception relevant to sustainability

### **29. Colorado College Sustainability Efforts**

Campus as an experimental environment for sustainability initiatives

Importance of involvement in hiring process

Plan to achieve carbon neutrality

Sustainability coordinator position as important player in sustainability

Willingness to participate in campus sustainability conversation:

AASHE STARS as a motivating factor toward sustainability

### **30. Sustainable Lifestyle:**

Sustainability as a way to live life

Lifestyle type of sustainability:

Building an Earthship

### **31. Ways to enact change:**

Methods to change behaviors:

Changing human behaviors

Beliefs not effective enough to enact change

Shift from ecocentric to anthropocentric perspective

Shifting the perspective of climate skeptics

Influential actions and thoughts toward sustainability:

### **32. Sustainability across time and space**

Times and Places where Society Values Sustainability:

Balance in Sustainability:

Interconnection in relation to sustainability:

## APPENDIX D: Selective Codes

### A) Formal Administrative Structure

#### Departmental Views

- 3. Faculty
- 10. Curriculum/ Teaching Sustainability
- 9. EV Program
- 4. Collaboration on Sustainability (team teaching)

### D) Curricular Topics:

*A Liberal Arts Institution should transition away from teaching within disciplines and establish curricula structured around the acquisition of knowledge through transdisciplinary topics and honor the process of learning and acquisition of skills.*

- 17. Resources
- 18. Food/Agriculture
- 22. Landscape/Built Environment
- 26. Energy
- 25. Climate Change
- 12. Systems

### C) Values associated with Sustainability

*A Liberal Arts Institution should create a context for student learning that honors the affective domain and fosters opportunities to develop individual values, attitudes and passions.*

- 8. Nature
- 14. Sense of Place
- 15. Society
- 16. Ethics
- 20. Culture
- 23. Optimism/ Positivity
- 24. Motivation
- 30. Sustainable Lifestyle
- 1. Definitions of Sustainability

### B) Informal academic structures

*A Liberal Arts Education should prioritize a process of learning that includes active participation and an inquiry based approach to develop students to become leaders and agents of change.*

- 13. Governance and Policy
- 19. Financial Resources/ Economy
- 5. Sustainability Programs on Campus
- 29. Colorado College Sustainability Efforts
- 27. Colorado Springs Community
- 11. Alumni

## APPENDIX E: Future Interview Questions

1. How do you structure your class to evoke themes of education for sustainability in your classes? Do you integrate transdisciplinary topics, evoke the affective domain and require participatory learning?
2. In what ways could the campus and Colorado Springs Community be integrated into your classes? Could you develop a set of final projects to bring this goal to actuality?
3. What is your perspective on creating a sustainability designation in the course catalogue to highlight sustainability focused courses?
4. What is the relationship between a liberal arts education and education for sustainability?
5. In what ways can Colorado College be an environmental leader for other HEIs?
6. Whose responsibility is it to lead sustainability efforts on campus? How are decisions currently made and are these channels of communication effective?
7. What are the strengths and weaknesses of campus sustainability management?
8. What are the most important next steps for Colorado College in its vision for sustainability? How can these goals be most effectively accomplished?

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