

# Sustainability in the University Student's Mind: Are University Endorsements, Financial Support, and Programs Making a Difference?

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## ABSTRACT

Despite the increasing awareness that sustainability is an issue needing ongoing attention, and despite millions of dollars spent yearly at universities to promote sustainable behaviors, previous research has found college students have primarily a unidimensional understanding of what sustainability encompasses. The current research sought to understand the depth of students' sustainability knowledge at one of the nation's "greenest" campuses and what implications this finding may have on future educational efforts. A representative sample of 779 students at a public liberal arts university were asked to define the term "sustainability" via an open-ended survey question. The survey also assessed students' knowledge of a dedicated on-campus sustainability office and preferred information sources and message channels. Definitions encompassing maintaining the status quo were the most prevalent, followed by definitions stating that sustainability had an environmental component. The least mentioned concepts were those encompassing the social or economic factors of sustainability—despite these factors being often-cited key components of sustainability. About one-third did not know their university had a Student Office of Sustainability. In addition, about 81% did not know that student fees had been supporting that office's \$200,000 annual budget since its inception in 2011. Students' preferred source and message channels for receiving sustainability information (i.e., a mix of interpersonal sources and mass media channels) highlight the need for interdisciplinary collaboration and a multidimensional approach in sustainability education. Improvements in message branding and an increase in learning opportunities both inside and outside the classroom are recommended for advancing sustainability education on college campuses. © 2017 National Association of Geoscience Teachers. [DOI: 10.5408/16-156.1]

**Key words:** sustainability, definition, higher education, student perceptions, communication

## INTRODUCTION

Sustainability has become an almost ubiquitous term at colleges and universities across the United States and world. According to a 2015 report by the Association for the Advancement of Sustainability in Higher Education (AASHE, 2015) 76% of institutions had at least one office or center with the word "sustainability" in its name, an increase from 71% in 2012.

The topic of sustainability is also receiving increasing international endorsements. As of January 2016, 499 colleges and universities from around the globe have documented their commitment to sustainability by signing onto the Talloires Declaration of 1990 (University Leaders for a Sustainable Future, 2016). Nationally, more than 600 schools have signed the American College and University Presidents Climate Commitment (ACUPCC, 2016), and even state-level compacts exist, like the Illinois Campus Sustainability Compact (2011) to which more than 50 schools are signatories.

Money has been increasingly pouring into sustainability efforts. As the AASHE reports, funding through sustainability fees, or "green funds" paid by students, has more than doubled from 4% in 2012 to 9% in 2015 (AASHE, 2015). Securing highly public endorsements and increasing funding

for sustainability initiatives on college campuses are indicative of significant commitments by universities and colleges across the globe. However, despite the growing trend of sustainability initiatives on university campuses over the last decade, a review of the research on this topic reveals that students' awareness and knowledge regarding the concept of sustainability appear to have become somewhat stagnant. This finding is somewhat surprising given that a primary purpose of investing in new initiatives on college campuses is to improve students' education on important topics. Therefore, the purpose of this research is to understand how current college students conceptualize sustainability at a midwestern public liberal arts university that is known for its dedication to sustainability and how future educational initiatives may be reframed to offer greater potential returns on investment. A comprehensive review of the literature detailing students' problems conceptualizing the concept of sustainability will first be articulated, which will lead into the research questions that guided this study. Results will be followed by key recommendations for educators that emerged from the data.

## Sustainability Operationalized

We can never expect students to have a unified understanding of sustainability if we, as academics, cannot come to a mutual understanding of what it entails. A search of the literature finds countless conceptualizations regarding what sustainability is, as well as repeated frustration surrounding the inability to find common ground on what an operational definition of sustainability should encompass (e.g., Brown et al., 1987; National Research Council, 1999; Lozano, 2008) and the use of fuzzy techniques to evaluate its impact on societies (Phillis and Andriantiatsaholainaina,

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2001). One of the earliest, and most abstract, definitions is from a report by the United Nations' World Commission on Environment and Development (WCED), which states that to be sustainable is to "meet the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). Others are a little more specific by defining sustainability as a list of behaviors that encompass what it means to be sustainable, such as the use of renewable energy sources, conservation, recycling, environmentally friendly land development, efficient water management, and proper waste disposal (Emanuel and Adams, 2011). A widely applied definition perceives sustainability as the intersection or overlap of the triad of economic, social, and environmental considerations (Barbier, 1987; Lozano, 2008; Sheth et al., 2011). For a thorough review of the history and variety of definitions of sustainability and sustainable development, see Lozano (2008).

### Students' Sustainability Knowledge: The First Step

Despite the large and ever-increasing financial investment and the widespread administrative-level emphasis of sustainability issues on university campuses across the globe, students' core knowledge of sustainability appears to have evolved little over time. In a 2002 study, Carew and Mitchell analyzed engineering students' open-ended responses regarding their understanding of sustainability. The authors voiced their concern that even after having coursework that explicitly covered the topic of sustainability, responses from 65% of the students were "not even . . . close to the ideal of an expert-like understanding of sustainability" (Carew and Mitchell, 2002, 359). When Kagawa (2007) asked students to define sustainability using keywords, concepts about the environment heavily prevailed, while other dimensions often cited as being part of sustainability (e.g., social and economic dimensions) were rarely mentioned. However, if sustainability is heavily conceived by students as a mainly environmental issue, it is concerning that Kaplowitz and Levine (2005) found in their survey of students at Michigan State University that 52.8% indicated they knew only a little or nothing about environmental issues or problems.

Hiller et al. (2012) reported that students' knowledge of social and environmental issues did improve after taking a course on globalization and the apparel and textile industry. However, they also noted that those students did not alter their purchasing behavior based on their improved knowledge.

Emanuel and Adams (2011) found in their study of college students in Hawaii and Alabama that about one-third indicated that they do not know much about sustainability. In addition, Savageau (2013) reports that most students, when confronted with issues of sustainability, find them distant, impersonal, or overwhelming—and therefore give little thought to them. These findings from studies of university students require questions to be answered about whether the estimated \$3.4 billion spent each year at American colleges and universities on sustainability initiatives (National Association of Scholars, 2015) is having any impact on students' knowledge of what it means to be sustainable or how to lead more sustainable lives.

### Geoscientists Engaging in Sustainability Issues

Because of its multidimensional nature, sustainability education efforts need to be approached in an interdis-

iplinary fashion (Jucker, 2002; Dale and Newman, 2005; Reid and Petocz, 2006; Lozano et al., 2013; Wu and Shen, 2016). Departments of Communication and Psychology can help students learn the social components of sustainability, while Departments of Economics and Business can help students with the economic side. Finally, traditional environmental science disciplines (e.g., biology, geology, and geography) can help students understand the environmental dimension. Examples of how geoscientists have become involved in transdisciplinary teaching on sustainability-related topics can be found in the July 2016 issue of the geoscience teachers' news magazine *In The Trenches* (e.g., Phillips et al., 2016; Sweeney and Jarchow, 2016; Szymanski et al., 2016). For detailed examples of transdisciplinary sustainability teaching modules and courses related to the geosciences, visit the InTeGrate website (SERC, 2016). Beyond being engaged in the teaching of sustainability topics, geoscientists conduct research on a range of sustainability-related topics, such as CO<sub>2</sub> sequestration (Bachu, 2000), groundwater management (Alley and Leake, 2004), and the role of mining (Gordon et al., 2006). The research project presented in this paper stemmed from a communication project in an undergraduate course, which led to a collaboration with a colleague in geology, culminating with a unique research team of students from different majors working together to understand sustainability issues on our campus.

### Theoretical Framework and Research Questions

While knowledge of a topic does not lead directly to the changing of behaviors, research finds that knowledge gain is usually the first step needed to start students along that path. This is a key component of McGuire's (2001) communication and persuasion matrix. This theoretical framework helps to provide educators with a foundation for understanding the sequential nature of persuasion. Students must first know and understand an issue before they can become willing to change their attitudes and then behaviors surrounding it. Therefore, we cannot expect students to perform sustainable behaviors in all facets of their lives if they do not know what sustainability is. Guided by this framework, we sought to answer the following research question (RQ1): "How do students define sustainability?" Beyond how students perceive the concept, it is important for them to be aware of the sustainability initiatives that are taking place on their own campuses if educators expect them to use the resources available to them. This line of reasoning led to our second research question (RQ2): "What do students know about sustainability initiatives on their own campus?"

However, simply providing students information about sustainability, and related initiatives on campus, would not be enough if that new knowledge was not delivered to the students in the ways they would like it delivered. McGuire's (2001) communication and persuasion matrix therefore provides educators a comprehensive preproduction checklist of information they should be assessing from their target audiences prior to disseminating any new information. For example, from whom would students like to receive information regarding sustainability (i.e., source) and from where (i.e., channel)? Knowing where, or from whom, students would be receptive to receiving information about sustainability should make future educational attempts on this topic more successful. Therefore, our third research question (RQ3) is aimed at understanding students' message

preferences: “What are college students’ message preferences for sustainability information?”

## METHODS

We conducted an online Qualtrics survey of students at the University of Wisconsin-Eau Claire (UWEC) to measure the level of students’ sustainability knowledge. UWEC is a public liberal arts university of approximately 10,500 students. Situated along the scenic Chippewa River; the school is often called “Wisconsin’s most beautiful campus” (*U.S. News & World Report*, 2015). The university and the City of Eau Claire are both actively addressing sustainability issues. Among other activities, the city’s Advisory Commission on Sustainability promotes sustainability awareness and provides advice to the city council (UWEC, 2015b). For 5 years running, UWEC has been recognized as one of the country’s “greenest” colleges according to the Princeton Review (UWEC, 2015a). The school was a charter signatory to the ACUPCC. It boasts a number of sustainability initiatives, including a Sustainability Living Learning Community (UWEC, 2015d); a sustainability program managed through the Housing and Residence Life Office that promotes activities such as “Caught Green Handed” and the “Just Bag It Fashion Show” (UWEC, 2015b); and an office dedicated to sustainability called the Student Office of Sustainability (SOS; UWEC, 2015c). The SOS was created in 2011 and has a yearly budget of \$200,000, which is funded solely through student fees of \$20 per student each year. The SOS is run entirely by student officers who are appointed by the student senate. The office offers about a dozen sustainability programs and initiatives that students can get involved in, from a bike lease program to a campus garden, an off-campus compost pickup program, and free reusable water bottle handouts. We chose to assess students’ knowledge of sustainability at this institution primarily because we felt that if one were able to document an awareness of sustainability issues among university students at any campus, UWEC, with all of its sustainability initiatives, would be a model campus.

### The Survey

Students in a fall 2015 strategic communication campaign design class helped to create an online Qualtrics survey. Students in the class distributed it to students in their social networks, and professors from numerous disciplines (e.g., economics, geology, communication, and philosophy) distributed the survey in their large introductory courses in exchange for extra credit. This method of data collection was used to ensure a more representative distribution of students across campus (i.e., both upper and lower classmen).

### Questions

Previous studies have sought to measure sustainability knowledge in multiple ways, from providing students with a limited set of responses via multiple choice response options (e.g., Emanuel and Adams, 2011; Zwickle et al., 2014), to providing factlike statements and asking students to rate their levels of agreement with them on Likert scales (Eagle et al., 2015), to limiting students to providing, at most, four keywords to answer the question, “What is sustainability?” (e.g., Kagawa, 2007). Similar to the approach of Carew and Mitchell (2002), and unlike most other studies of sustain-

ability knowledge in students, we decided to take a truly unbiased measure of sustainability knowledge—simply asking students through an open-ended prompt to define sustainability in their own words. The question specifically asked: “What is sustainability? What does it encompass? In other words, what do you think is the definition of sustainability?” Students were then able to provide as much, or as little, information as they wanted. This was the first question on the survey; therefore, no other questions on the survey would have biased their responses.

Subsequent questions on the survey focused on locally relevant sustainability knowledge. Students were asked questions regarding their specific knowledge of their own campus’s SOS. They were asked whether they knew if the campus had a SOS. Once they were informed that the campus did have a SOS, they were asked whether they knew its budget, where its funding comes from, how familiar they are with how the SOS spends its budget, how many of 11 activities the SOS performs they were aware of, and where (or from whom) they would like to receive information about sustainability.

### Participants

The survey collected responses from approximately 7.4% ( $n = 779$ ) of the entire student body and from a representative collection of students from each year: 24% freshmen, 24.1% sophomores, 18.6% juniors, 24.4% seniors, 7.4% 5+-year seniors, 0.4% graduate students, and 0.9% nontraditional students. Approximately 64% of the participants self-identified as female and 34% self-identified as male, which is in line with the overall campus population of 60.4% and 39.6%, respectively. The race or ethnicity of the participants was similarly representative of the student body on campus, with Caucasian (89.7%), Asian (5.4%), those who classified as other (3%), and less than 1% each of African Americans, Hispanics, Native Americans, or Pacific Islanders (UWEC, 2015e).

## RESULTS

### Sustainability Definition (RQ1)

Of the 779 students who took the survey, 749 answered the open-ended question that asked for a definition of sustainability. To analyze this large amount of open-ended data, our research team took a thematic analysis approach in which the data were first open-coded by undergraduate members of the authors’ research team (Braun and Clarke, 2006). These research team members first individually read all responses given by participants and then identified themes that emerged from the data. At a research team meeting, the research assistants discussed their themes as a group, and the authors then compiled the agreed-upon themes into a preliminary coding scheme.

Seven coding categories emerged from the data (see below and Table I). Coding consisted of simply identifying the presence or absence of the coding categories in each of the responses. A participant’s response could contain multiple codes. The two authors trained on this coding scheme by coding small portions of the dataset concurrently before sufficient interrater agreement was reached. The authors then individually coded all remaining data. Cohen’s kappa ranged from 0.769 to 0.869 for each coding category, which is an acceptable level of intercoder agreement (Landis



TABLE I: Components contained in students' definitions of sustainability ( $n = 749$ ).

Emergent Codes	Percentage of Participants ( $n$ )	Exemplar Comments
Maintenance—Ability to Keep Going	43.7% (327)	• “Ability to continue something”
		• “Capacity to endure”
		• “Keeping everything in a functioning fashion”
		• “Maintain things”
Environment	31.9% (239)	• “Making efforts to preserve the environment”
		• “Helping the environment”
		• “Being environmentally responsible”
		• “Being eco friendly”
Preserve Resources	26.8% (201)	• “Not using up all our resources”
		• “Using resources as needed, and not overusing”
		• “Using less resources, or re-using resources”
Green behaviors	16.6% (124)	• “Going green”
		• “To reduce, reuse, and recycle”
		• “Not wasting materials, and trying to reuse stuff as much as possible”
Future Looking	10.5% (79)	• “Trying to take care of the Earth for future generations”
		• “Preserving Earth’s resources so future generations can use them too”
		• “Taking care of the planet so future generations can enjoy the earth as we have”
Energy	7.3% (55)	• “Using energy sparingly”
		• “Not wasting energy”
World Benefits (Including Social and Economic)	7.1% (53)	• “Doing things to benefit the world”
		• “Promoting the preservation of our social [and] economic . . . systems”
		• “How we keep our world clean and in order”
Other <sup>1</sup>	5.3% (40)	

<sup>1</sup>Comments coded as “other” were those that could not be fit into any of the codes and were usually unrelated to the topic (e.g., “I don’t know,” “the ability not to drink,” and “being able and ok”).

and Koch, 1977). The coders had 94.2% overall agreement and met to resolve the disagreements until 100% agreement was reached.

**Maintenance**

The most frequently occurring code in participants' definitions was an idea of maintenance ( $n = 327$ , 43.7% of respondents). This code consisted of statements in definitions such as “to be able to carry out a stable living,” “to be consistent and stay that way over a certain amount of time,” and “the ability to continue a certain behavior.”

**Environmental**

The second most frequently occurring code consisted of ideas representing environmentalism ( $n = 239$ , 31.9% of respondents). Examples of participant responses that fit into this category included statements such as “it is to look after our planet and environment,” “I think that sustainability means to act in a way that is not harmful to the environment around you,” “practicing eco-friendly behaviors,” and simply, “taking care of the earth.”

**Resource Conservation**

The third most frequently occurring code consisted of statements related to resource conservation ( $n = 201$ , 26.8% of respondents). Instances of these included “Using the resources provided to you in a smart and efficient way, making the most of what you have being sure not to waste excess resources,” and “I believe sustainability is using limited resources and taking care of them.”

**Green Behaviors**

“Green” behaviors were the fourth most frequently occurring code ( $n = 124$ , 16.6% of respondents). Examples of responses in this category included “Sustainability is recycling”; “activities like recycling, saving water, stuff like that”; and “the ability to reuse or recycle items that should be.”

**Future Looking**

Statements that mentioned a future orientation were the fifth most frequently occurring ( $n = 79$ , 10.5% of respondents). Definitions incorporating statements that showed students thinking longer term included “Sustain-

**TABLE II: Source and channel preferences from whom and where students would like to receive information about sustainability ( $n = 779$ ).**

Source or Channel	Percentage ( $n$ ) <sup>1</sup>
Posters	37.5% (292)
Professors or instructors	34.7% (270)
Facebook	30.6% (238)
Friends	28.5% (222)
E-mails	27.5% (214)
School staff members	27.0% (210)
Television	20.4% (159)
Table tents	18.4% (143)
Family members	17.2% (134)
Newsletters	16.8% (131)
Twitter	16.7% (130)
Resident assistants	15.9% (124)
Website of organization	14.5% (113)
I don't want information	13.1% (102)
Radio	12.6% (98)
Digital signage	8.1% (63)
Other	1.3% (10)

<sup>1</sup>Sum of percentages is greater than 100% because multiple responses could be selected by participants.

ability is when you are courteous of future generations needs while still meeting your generation's current needs," "it is the ability to be forever providing," and "to make decisions today that allow you to be around in the future."

### Energy

The sixth most frequently occurring coded responses were statements including ideas about energy, energy conservation, or energy efficiency ( $n = 55$ , 7.3% of respondents). For example, "Sustainability is to conserve energy" and "sustainability is a word used to describe something that is energy efficient."

### World Benefit

The least frequently coded category was sustainability as providing a benefit to the world ( $n = 53$ , 7.1% of respondents). These statements were operationalized in the coding scheme as ones that discussed the world's survival, or sociological or economic benefits for the world as a whole. Examples of the statements coded in this category included "sustainability is acting in a way that benefits the good of the world," "being friendly and conscientious of the world," "making the world a better place," and "economic and social longevity."

Forty responses did not fit into any of the coding categories. These included statements such as "Sustainability is the ability of systems to prosper independently," "to use efficient use of your tools," and "being able and ok."

### Knowledge of Campus Efforts (RQ2)

With regards to sustainability efforts happening on their own campus, about one-third of students (31.8%) either

were unsure or were unaware that UWEC had a SOS. Approximately 90% of students ( $n = 699$ ) did not know that its budget was \$200,000, with approximately half of the respondents (51.1%) believing that its budget was \$10,000 or less.

Only 18.8% of students ( $n = 146$ ) knew that they financially supported the SOS through additional student fees. The remainder of the students thought the funding came from general tuition dollars (15.4%) or state taxpayers (9.8%) or simply stated they did not know (56%).

Based on students' responses on a 7-point Likert scale (1 = strongly disagree [SD], 7 = strongly agree [SA]) question that assessed their agreement to the statement, "I am familiar with how the SOS spends its \$200,000 budget," a one-sample Student's  $t$ -test revealed that students are not familiar with how SOS funding gets used,  $t(772) = -34.81$ ,  $p < 0.001$ , with the mean score falling significantly below the midpoint of the scale ( $M = 2.28$ ,  $SD = 1.37$ ).

Finally, when provided with a list of the 11 most prominent SOS activities (e.g., a bike lease program, campus garden, free water bottle distribution, and e-waste recycling program), the average number of activities students indicated they were familiar with was 2.68 ( $SD = 2.72$ ).

### Students' Sustainability Message Preferences (RQ3)

Students responded to a 17-item closed-ended question that asked them to indicate all the places where, and from whom, they would like to receive information regarding sustainability. The top five responses were posters, professors or instructors, Facebook, friends, and e-mails. Digital signage around campus ranked last (Table II).

## DISCUSSION

Despite the explosion of sustainability efforts on university campuses across the United States and around the globe, our findings indicate that students, at least from our university, still have a fairly rigid and unchanged idea regarding what sustainability encompasses.

### Maintenance Doesn't Help the Future

Whereas a large portion of students from our institution mentioned that sustainability has an environmental component, the most worrisome finding from our survey was that the most frequently occurring code students mentioned when defining sustainability regarded an idea of maintenance. Sustainability is not and should not be simply about maintaining the status quo. As the often-cited "Brundtland Report" (WCED, 1987) definition states, sustainability is about not only meeting our current needs but ensuring the needs of future generations can be met as well. Thereby, sustainability is a more holistic concept that should seek to improve the planet, not to keep it going down its current path.

Equally troubling, the frequently occurring idea of maintenance to define sustainability connotes a present-day orientation of student thinking. As the results from our survey indicate, few students think long term about sustainability and the helping of generations that come after us—as evidenced by only 10.5% of respondents' definition that included a future outlook. While disconcerting, this lack of a future orientation, or future time perspective, of students is well documented in the literature (e.g., Nurmi, 1991;

Keough et al., 1999; Carew and Mitchell, 2002) and could be a result of an increase of self-centeredness among university students over the past decades (Twenge et al., 2008; Twenge and Foster, 2010).

This lack of future orientation in students' sustainability definitions could also partially be related to pessimism students possess toward the future of our planet. Kagawa (2007) found that many students think the future is bleak and that ecological catastrophe is inevitable regardless of what we do today. Therefore, students' definitions of sustainability could be reflections of this fatalistic attitude toward our planet.

### **Social and Economic Factors Forgotten**

A widely used, common definition of sustainability frames the concept within the context of overlapping social, economic, and environmental spheres (Barbier, 1987; Lozano, 2008). While the environment was the second most frequently mentioned component of students' definitions of sustainability (31.9%), few mentioned its social or economic impacts. Only eight survey participants (1.1%) identified all three of these sustainability components in their definitions. Five other students (<1%) mentioned the words "social" or "society" in their definitions without mentioning the economy, and three students (<1%) mentioned the words "economic" or "economy" without including a social component. Example codes included "Valuing the interdependence and promoting the preservation of our social, economic, and environmental systems," "Meeting the needs of the current society," and "being economically friendly." In our coding scheme, these ideas were captured in a larger code that encompassed more general world benefits, which was the least frequently occurring code in our dataset.

### **What This Means for Sustainability Education**

University administrations have been signing onto international sustainability declarations and pouring millions into sustainability efforts on university campuses for more than two decades. Yet, our data show that despite these ever-growing efforts, there remains a knowledge gap among students about what sustainability means. Therefore, this special issue on sustainability education seems to be happening at a perfect time.

Although a commonly agreed upon definition of sustainability remains elusive—beyond the widely held interpretation of the inclusion of environmental, social, and economic components—the view that sustainability inherently includes a perspective of looking to the future is integral in the concept (WCED, 1987; Cortese, 2003). As our survey found, the only component university students frequently mention is the environmental component. Statements that show future orientation and social and economic elements are some of the least prevalent. Even at a campus such as UWEC, which has been lauded nationally for its commitment to being green, one-third of students do not know that there is a SOS—with the majority not knowing how that office is funded or where it spends its money. If we want students to be more sustainable, it is going to take more than just money, and the creation of aptly named offices, to lead to knowledge and behavioral shifts.

### **Initiatives Need More Specific Branding**

Part of the inability of students to grasp the entire concept of sustainability might simply be in the name and branding of the organizations that promote sustainability on their campuses. Simply using the term "sustainability" in the names of offices, agencies, and organizations is not enough if we want students to understand this concept's multidimensional characteristics. Given the lack of awareness regarding components of sustainability other than the environment, focus should be dedicated to educating students about sustainability's other pillars (social, economic, and future importance). An acronym of SEE (social, economic, environmental) could be used to shorten some of these components for placement on sustainability related materials or in the names of these offices.

### **Embrace Interdisciplinary Collaboration**

The combination of the coauthors' differing areas of expertise led to unique solutions to approaching our campus's sustainability initiatives that would not have been possible without the cross-disciplinary collaboration. We concur with previous scholars who have called for universities to adopt an interdisciplinary perspective on integrating sustainability within their curricula (e.g., Jucker, 2002; Dale and Newman, 2005; Reid and Petocz, 2006; Lozano et al., 2013; Wu and Shen, 2016). If an interdisciplinary approach is not adopted, institutions of higher learning are destined to have generations of students who continue to primarily perceive sustainability as an environmental issue without regard for our social and economic futures.

### **Support Learning Both Inside and Outside the Classroom**

Communication campaign research continues to find that the most successful messaging campaigns are those that reach target audiences across multiple channels (Snyder and LaCroix, 2013). Our research supports these findings through results of a question that asked where students would like to receive information about sustainability. The top five places from which our students said they would like to receive sustainability information were a mix of both mass media (i.e., posters, Facebook, and e-mail) and interpersonal channels (i.e., professors and friends). These message and source preferences reveal that offices of sustainability at campuses not only need to create mass-produced messages for viewing outside of classrooms but also need to focus on influencing professors and instructors in bringing sustainability education into the classroom.

Given that message and source options, and nomenclature, may differ across college campuses, we recommend that schools conduct their own formative research on their student bodies to determine from whom, and where, their students would prefer to receive sustainability-related information. These simple measures would ensure educators receive the greatest return on investment.

### **Study Limitations and Future Directions**

The primary limitation of this research was that it was conducted at one, midsize liberal arts institution. Therefore, readers should be careful not to overgeneralize the results to all college students. However, while this study may not provide definitive proof that there is a knowledge deficit at all institutions, the results add to the body of research that has documented the ongoing existence of problems in how



students conceptualize sustainability. Concurrently, the similarities between the findings presented here and those reported in prior studies provide a level of credibility to this work. If one of the “greenest” universities in the country, which has spent nearly \$1 million of student fees on sustainability efforts over the past 5 years, has students who primarily equate sustainability with maintaining a current way of living, it is likely these perceptions exist in even greater numbers at other institutions without such resources. Therefore, this study helps to serve as a barometer, indicating that the results might be indicative of a larger problem that new sustainability offices, and ever-increasing funding, need to address.

It may be helpful for future studies to continue to ask student populations the simple question of “what is sustainability?” so that advances in student knowledge and understanding of this topic could be reliably tracked over time. Possibly one of the large sustainability organizations (e.g., AASHE) could require that a yearly, standardized survey be distributed among member institutions as a condition of membership, and those data could be placed in a publicly available repository for all institutions to access to help them inform future educational initiatives.

### Assessing the Validity of Students’ Definitions

The online survey method did not allow for controlling whether students searched the internet for their answers. Our first question, “What do you think is the definition of sustainability?” was intentionally designed to be open ended and to encourage students to give their own reflective answers rather than a “correct” answer. Being open ended meant that there was the possibility that some students might conduct an internet search for the word “sustainability” or the phrase “sustainability definition.” Searching for these keywords generates links to Wikipedia and to online dictionaries. Wikipedia’s definition includes the phrases “biological systems” and “endurance of systems and processes” (Wikipedia, 2016). Only one response in our study included the phrase “biological systems,” and one other response included the phrase “The endurance of systems and processes.” Other responses included the following terms that are common to online dictionary definitions: “endure,” “sustain,” “support,” “upheld,” “certain rate,” and “confirm.” Analyzing the context of how those terms were used in the responses suggests the possibility that up to 19 out of 749 responses may have been obtained partially by internet searches. The nonalignment of the overwhelming number of responses we received to the Wikipedia and online dictionary definitions that appear in an internet search leads us to have confidence that most students provided their own subjective definitions of sustainability and that the survey results yield valid insights into students’ conceptions of sustainability. However, even if a large number of students had conducted an online search for a definition, this would showcase a failure on the part of university educators to instill a definition in students’ minds that they can remember without the aid of a search engine. Based on the low number of responses that discussed the often-cited social or economic considerations, or the need for a forward-looking component, it is our interpretation that most of the definitions students offered are an accurate and valid representation of their knowledge. Future researchers may want to conduct a survey of this nature in

person to avoid the potential of students obtaining an answer from a peer or from another source.

### CONCLUSION

Even though there are a number of definitions related to sustainability in the literature, two themes are continually recurring and seem to encapsulate the gestalt of sustainability. The first is that current lifestyle choices should not preclude future generations from being able to have access to natural resources to meet their needs (WCED, 1987). The second theme is that the sustainable lifestyle choices of the current generation are not limited to choices made regarding environmental protection but must integrate those choices within a social context and involve economic considerations (Barbier, 1987).

Whereas this analysis in no way reaches the level of a longitudinal study, we feel that when the results of this study are placed in the context of prior findings, the recurring, overall message is indicative of a larger issue surrounding students’ conceptualization of sustainability. Similarities that we found between our results and those of prior studies from universities around the globe add validity to our argument that there appears to be fairly little movement in students’ conceptual understanding of sustainability’s multidimensional nature since the start of the 21st century. This finding would suggest that the status quo of sustainability efforts such as university endorsements, financial support, and campus programs are not enough. The multidimensional concept of sustainability requires a multidimensional approach to raising students’ awareness of the pertinent issues. Unless communicators, educators, economists, geologists, biologists, sustainability offices, and everyone else on college campuses that care about sustainability come together to more broadly educate the future caretakers of society about what sustainability encompasses, the goal of a sustainable planet likely will never be achieved.

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