A Toolkit for Building Sustainability at Dartmouth

Environmental Studies 50, Spring 2011

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Introduction

In the "Environment Problems and Analysis" course at Dartmouth College, a group of students come together to formulate and justify policy measures that deal with a local environmental problem affecting Dartmouth College, the Upper-Valley, or a nearby community. This year, formulation of a project for the class coincided with the recently initiated Dartmouth College Sustainability Strategic Planning Process. Dartmouth College has a strong legacy of sustainability efforts (ENVS 50 course syllabus, 2011) and a reputation for being connected to the outdoors. Today, however, other universities, such as Arizona State University, Yale, Oberlin, Harvard and Middlebury, are racing forward with new sustainability initiatives, sustainable building designs, and new, innovative academic programs. Dartmouth's status as a "leader in sustainability" has been left in the dust. Initiation of the Sustainability Strategic Planning Process is an effort by the College to restore its role as a leader in sustainability by laying out a high- level road map towards sustainability leadership with specific milestones to bring the College to its desired destination (ENVS 50 course syllabus, 2011).

The Sustainability Strategic Planning Process is driven by the Sustainability Steering Committee, who has designated three working groups to focus sustainability in particular areas of the Dartmouth community, namely, Energy, Culture and Learning, and Material Flows. The working groups integrate feedback into their final deliverables from several sounding boards including one made up of alumni and one of Upper Valley and Hanover community residents. Each working group is tasked with presenting a set of deliverables to the Steering Committee:

A base case, "where we are now in 2011" summary

A "Leadership in this area = _____" Vision Statement

A high level map to leadership, including actions

A description of the ongoing governance required for lasting sustainability and continuity of efforts

What structures are needed for long-term success in this area?

A communication plan for this area

What kind of communication is needed for success?

(The Sustainability Planning Process for WG Members 4.11.11)

After learning more about the Sustainability Strategic Planning process, our class decided that, in our role as students, we would be most effective in supporting the efforts of the Culture and Learning Working Group. To do this, our class has created an informational "tool-kit" that provides foundational information about sustainability at Dartmouth that can help the working group begin to develop its deliverables.

The Culture and Learning tool-kit consists of four components, each targeted at providing supporting information and research relevant to a particular deliverable of the Culture and Learning Working Group.

1. A Recipe for Success: This chapter examines the successes and failures of past student-initiated sustainability projects, similar to this one, in an effort to contribute to the base-case summary of where are we now in terms of sustainability at Dartmouth. The group focused on particular case studies of: the Dartmouth Organic Farm, the Sustainable Living Center, the Big Green Bus and the Dartmouth GreenLITE project. After examining these projects, they developed a "recipe of success" that provides students and the working group guidelines that they can follow when starting and implementing future projects from scratch here at Dartmouth.

2. Sustainability within Dartmouth Sub-Culture: This chapter seeks to define sustainability within several of Dartmouth's larger sub-communities of students, namely the athletic and Greek communities. Armed with insight into these communities, the group has recommended a set of standards to follow when addressing sustainability within each "mini-culture" and creating effective sustainable solutions to any identified problems.

3. Assessing Student Environmental Knowledge and Curricular Integration of Sustainability: This chapter examines specifically the "Learning" piece of the working group. This chapter examines student sustainability knowledge at Dartmouth, as well as the integration of sustainability teaching into academic departments with the largest number of declared majors. A statistical analysis revealed an important link between declared major, curricular integration of sustainability teaching, and sustainability knowledge. The chapter makes several recommendations about further integration of sustainability concepts into department curricula and an assessment of the student body's understanding of sustainability.

4. Improving Student Group Communication: This chapter looks at trends in communication patterns among different groups and departments on campus. Common frustrations, such as issues with Blitz-mail, student culture, and lack of coordination, are

identified, as are best practices, exemplified in the organization of two campus groups, the Pan-Asian Council and the Dartmouth Outing Club. After describing the communication landscape at Dartmouth, suggestions are made as to how green groups can better organize and network. A comprehensive and cohesive model for effective communication will be instrumental in implementing sustainable change at Dartmouth.

The tool-kit outlined above will provide the Culture and Learning Working Group of the Sustainability Strategic Planning process with essential groundwork for starting its mission to develop a high-level system of governance that will accomplish the nuts and bolts of sustainability at Dartmouth College (The Sustainability Planning Process for WG Members 4.11.11). Last year's ENVS 50 class presented convincing evidence that the Dartmouth community, students, faculty, and administrators alike believe that Dartmouth College should push itself to become an innovative leader in sustainability (ENVS 50,2010). The tool-kit has developed the essential mechanisms for transforming this optimism and energy around sustainability into a concrete framework to accomplish this vision.

Chapter I: A Recipe for Success

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Introduction

Some recent sustainability projects at Dartmouth have advanced sustainability on campus; others have not. In the examination of some of these projects, we find some interesting lessons for the future of sustainability initiatives at the College. Specifically, the Dartmouth Organic Farm, the Sustainable Living Center, the Big Green Bus and the Dartmouth GreenLITE projects each represent a student-involved initiative with mixed results. Our goal in studying these is to develop a "Recipe for Success", by drawing conclusions from the results of our research and giving future students guidance to follow when planning and implementing future projects at Dartmouth.

The format of our report is as follows. We begin by describing each project, outlining each project's objectives, and identifying the project's main actors and governance structures before examining impacts and records of success at Dartmouth. In our examination, we analyze different ways in which these projects have succeeded or failed, and suggest common themes that explain aspects of their success or failure. We take a particularly close look at factors that have hindered the expansion of each of the four projects.

We report on interviews with some of the main actors involved in the four projects. These actors include faculty and staff such as Scott Stokoe (Organic Farm and the Sustainable Living Center), Rory Gawler (Big Green Bus) and Professor Lorie Loeb (GreenLITE), as well as various students who were involved in these projects in different capacities.

What is Success?

During our research, we were faced with the fundamental question of defining success for sustainability projects at Dartmouth. In considering several different definitions, we settled on one that defines project success as "the degree to which project objectives are met" (de Wit, p. 164), as we feel that each individual project occurs in a unique situation of time and resources. As such, the only fair way to measure each project's accomplishments is by its own criteria. We find this definition to be the most applicable to the four case studies that we have chosen because all four projects had stated objectives that they wanted to achieve at the time of their founding.

It then makes sense that we evaluate each of the four case studies to be mixed successes, because if all objectives had been accomplished, there would be no need for the project's continued existence.

Methodology

Tasked with determining what common threads lead to success among sustainability initiatives at Dartmouth College, our group researched relevant peer-reviewed articles related to a close proxy for our own study – corporate organizational evaluations. Our review of the literature came across Eric Flamholtz's article "Towards an Integrative Theory of Organizational Success and Failure: Previous Research and Future Issues" (2002). In this study, Flamholtz presents a theoretical framework by which organizations in the corporate world may be evaluated. Flamholtz distilled from his own exploration of the literature six aspects of organizations by which to measure success and failure. These are:

- *Identification of Market Segment and Niche*
- *Development of Products and Services*
- *Acquiring Resources*
- *Development of Operational Systems*
- *Development of Management Systems*
- *Developing Corporate Culture*

(Flamholtz, 2002)

We found these to be useful categories, but modified them so as to address specific concerns within our case studies. 'Identification of Market Segment and Niche' and 'Development of Products and Services' were adapted so that we would outline the history of, identify the sustainability needs addressed by, and elucidate the objectives of each initiative. 'Acquiring Resources' was equated to funding, which we believed would play an important role in each project's success. 'Operational' and 'Management systems' were recast as internal and external governance structures, respectively, of each sustainability project. Finally, 'Corporate Culture' was adapted to address the major and supporting actors in each initiative. In this way, we arrived at our four overarching categories for study:

- *Project history: including project objectives,*
- *Actors: both main and supporting,*
- *Governance: internal structures, external structures, and as it relates to funding,*
- *Impact: including affected groups, and the benefits of each project*

We opted to perform four individual case studies of sustainability initiatives on campus. This choice was made for several reasons. The detailed and qualitative nature of our research necessarily restricted comparison to a small sample of projects. The small number of sustainability projects existing on campus and the lack of quantitative data for said projects prevented statistical analyses. Finally, by our estimates, the restriction placed on us by the length of the term of study (a mere ten weeks) allowed us just enough time to examine one project each at the level of depth that yielded both relevant and significant data.

Considering all of the points above, our group developed a standard interview form by which to collect data from main actors involved with each project (see Appendix, item 1). We also surmised that by limiting the scope of our research to projects either wholly or partially initiated by students, we could more easily compare projects. Furthermore, this approach avoids complications related to comparing initiatives that come from different departments on campus.

By focusing on student-initiated projects, we experienced several benefits. First, we could be sure that we were familiar with and had a working knowledge of the main actors' environment and limitations, being students ourselves. Second, we would focus on projects developed by a transient population, as the vast majority of students remain at Dartmouth for only four years of undergraduate study; the results of this narrowed focus would imply that paid, 40+ hour/week involvement by many actors is not necessary, and therefore that sustainability initiatives *can* begin as relatively small and practical projects to reduce Dartmouth's environmental impact or to spread awareness of such. Finally, all student-initiated projects were developed from the most prolific and diverse human resource on campus – the student body itself, in effect a 4000+ member “brain-trust”. On this last point, the College exists at its most basic level to serve the students, so we could be certain that this group will always exist as long as Dartmouth does. Given effective encouragement and support, we hypothesize that the student body could be harnessed to provide the greatest source of sustainability innovation available to the College.

Case Study – The Dartmouth Organic Farm

Description

The Dartmouth Outing Club website describes the Dartmouth Organic Farm as "a student-run educational and working garden that provides members of the Dartmouth community with opportunities for independent research, student projects, and hands-on experience in sustainable food and energy systems" (Dartmouth Outing Club, 2010). Therefore, we can infer that the Farm was founded with the following objectives:

- *To serve as a center for research.*
- *To teach members of the Dartmouth community about sustainable foods.*
- *To give Dartmouth students hands-on-experience in organic agriculture.*

Since its start in 1996, the Farm has achieved each of its goals to a limited extent, but its potential for expansion has fallen woefully short of the vision first put forth by its founding members – cultivated land area is small, funding is stagnant, and volunteers to help with various farm processes are limited in number. Some successes have been seen here though. Under the Environmental Studies Program (ENVS), the Farm has been utilized by ENVS 25: Ecological Agriculture, a popular class in which the laboratory component of the course is conducted at the Farm. Additional opportunities exist, both for professors to do field research at the Farm, and for students to volunteer and intern at the Farm year-round.

Actors

According to Scott Stokoe, who is currently the manager at the Farm, the idea to start the Organic Farm came from "a passionate group of students who would not take 'no' for an answer" (Stokoe, 19 April 2011). Although the idea for the Farm had been proposed as early as 1988, it was not until 1996 that it was actually realized. This delay was due to debate surrounding the bureaucratic placement of the Farm; out of logistical and funding concerns, the ENVS Department wanted it under the Outdoor Programs Office (OPO), while OPO wanted the Farm under the ENVS Department (Stokoe, 19 April 2011).

Eventually, OPO accepted this responsibility, and the Organic Farm continues to operate today. Currently, Stokoe manages the Farm with the help of student volunteers. He reports directly to Dan Nelson, the Director of OPO.

Stokoe maintains that his main supporters, by far, are student volunteers. He does, however, acknowledge particular support from a few other people around the College. These include Professor Ross Virginia, a former ENVS 25 professor; Andy Friedland, the chair of the Environmental Studies Department; and the various members of the OPO.

Funding and Governance

Although Stokoe did not disclose the exact amount of money in the Farm's budget, he did make one thing clear: the Organic Farm has had the same budget since its creation in 1996, even as operating costs have risen dramatically. As mentioned earlier, these funds come from the Outdoor Programs Office. Stokoe is the only salaried staff member working at the Farm; all other farm workers are there on an unpaid, voluntary basis. As a result of increasing costs without increasing funding, the Farm has not managed to reach its full potential for agricultural production.

Timeline

The administration rejected the first proposal for the DOF in 1988 and subsequent others until 1996. After acceptance in 1997, the Farm was granted a permanent status under the Outdoor Programs Office (Organic Farm, 2010). In 2003, the ENVS 25 course was established.

Additionally, in 1999, students involved in the Organic Farm proposed a living center that would allow those frequenting the farm to live together in a communal space. The initial proposal for this center was not accepted, because the students proposing the project graduated, and no other groups immediately picked up the reins. Things would change in 2007, when a new group of students discovered and repurposed the idea in order to create a sustainable student residence on the Dartmouth campus proper. The Office of Residential Life approved these new plans in the fall of 2007. The residence became known as the Sustainable Living Center (SLC). Today, the Center houses 19 students, many of whom are active volunteers at the Organic Farm. The SLC even gets some of its food from the DOF when it is seasonally available. The SLC is discussed at length as an independent project later in this chapter.

Impact

The Dartmouth community - especially the student body – is widely regarded to have been very receptive to the DOF throughout its history. ENVS 25, which is partially taught at the farm, shows great popularity amongst students. Each summer term, this class always fills to capacity; and in 2008, the waitlist for ENVS 25 was twice the number of spaces available (Virginia, 5 May 2011).

The Farm has not only been a center of education and research, but has also served as a social space wherein students can meet to discuss organic farming and sustainability. It has been the epicenter of promotion for sustainable living – particularly local food-sourcing – at Dartmouth. Naturally, due to their integrated history, there is a good deal of crossover in this regard between the DOF and the SLC. Appropriately, Stokoe serves as an advisor to the residents of the SLC in addition to his farm management duties. Together, the SLC and the Farm have promoted sustainability among students in many ways.

Students and community members have also had a chance to buy products from the Organic Farm. During each fall season, produce is sold to the public once a week outside the Collis Café, and to the Collis Café dining facility itself. Unfortunately, the Farm does not produce enough volume in order to supply other Dartmouth Dining facilities.

Aspects of Success

Based on the objectives of the farm, we conclude that it has achieved some success. The farm has enhanced education in sustainable agriculture through ENVS 25, professors have been able to conduct field research at the farm, and students have the opportunity to volunteer and acquire hands-on experience in agriculture. Although the farm's objectives have each been realized to some extent, there still remains room for great improvement, however. For instance, enrollment in ENVS 25 is currently limited to about 35 students, and the course takes place only once a year, over the warm and agriculturally productive New England summer months. This cap at 35 students has remained constant even though more than 50 students register each summer to take the class.

Secondly, agricultural output from the Farm has not improved because of stagnant funding. The number of volunteers working the field at the Farm is limited by those with the

ability to travel three miles to a location relatively distant from the rest of campus, also hindering production. This latter fact puts the Farm at a distinct disadvantage, as expansion and increased availability of local organic food from the Farm is directly related to the amount of land that can be cultivated, and this is wholly dependent on the number of volunteers that are able to show up and assist Stokoe in the strenuous and meticulous manual labor of farming.

Case Study – Dartmouth GreenLITE

Description

Initially, GreenLITE began with the idea that providing students with feedback about how much energy was being used in their dormitories would change individual student behavior and attitudes towards the broader climate change concern. This idea led to the creation of the project itself, which pairs data monitoring with correlating imagery – a wintry scene featuring polar bears in various states of distress – as a simple indicator of energy use. The state of the polar bear graphic corresponds to residents' energy use. For example, when occupants of a participating building are using what is judged to be too much energy, the polar bear's environment is shown as in critical danger; whereas if energy use is low, the polar bear's environment is shown in a stable condition.

According to Sonia Lei '08, one of the original creators of the polar bear animations, the founding group's main goal was to observe whether there would be any response to the project's monitors in terms of behavior in energy usage (Lei, 7 May 2011). According to Professor Lorie Loeb, the project's main facilitator, the project was created to influence both residents' behaviors and their attitudes toward energy use by using imagery to prompt an emotional reaction. When the project was initiated, and the desired response was observed through the data, the founders decided to install monitors in more dormitories in order to promote more widespread behavioral and cultural change. In total, about nine dormitories and buildings have installed monitors (Loeb, 20 April 2011).

Timeline

GreenLITE was established campus-wide in 2008 (Dartmouth News). Currently the project's study is ongoing and continues to grow. Recent developments include the expansion of

GreenLITE's service to businesses, households, and schools outside of Dartmouth affiliations, through its spin-off company, TellEmotion, Inc. According to Loeb, their most meaningful client has been Miss Porter's School in Farmington, CT, which began using the service in January of 2011. She reports that the school has noticed a 13-14% reduction in energy use in the school's dormitories since the program started (Loeb, 20 May 2011). Within the Dartmouth community, GreenLITE has recently expanded to the Tuck School of Business dormitories, where it is known as "GreenLITE Tuck" (GreenLITE Tuck Website).

Actors

GreenLITE involved Professor Loeb and several interested students from the Computer Science Department, the Thayer School of Engineering, and the Tuck School of Business. The tasks of each student ranged from writing software on which GreenLITE is based, to creating graphics used for the monitors' displays.

Although students played a major role in the program's implementation, according to all student interviewees, Loeb put all her efforts and resources towards the project's completion. Although initially proposed as a student project, Loeb provided the foundation needed to help the project take off. The late Donella Meadows, a professor in the Environmental Studies Program, inspired Loeb to take on the project (Loeb 11 May 2011). Now Loeb is considered the main person behind GreenLITE, and is the CEO of TellEmotion, Inc (TellEmotion, Inc Website, *Who We Are)*.

Since GreenLITE's implementation, other variations of the project have appeared. During the summer of 2009, Qian Qian Zhao '11 sought the advice of Loeb to develop a similar program that measured water usage alone (Zhao, 30 April 2011). She became more interested in pursuing this project after consulting with Loeb. Zhao focused on the human-to-computer interaction.

On the technical side of GreenLITE, the installation of the monitors and meters must be done very precisely, so attention to infrastructure is vital. Loeb mentioned that Steve Shadford and his team from Facilities Operations & Management (FO&M) department have been very helpful with this aspect of the project (Loeb, 11 May 2011). Similarly, necessary faculty support for the project has been attributed to the Provost's office and the Dean of Faculty.

Funding and Governance

From the beginning, the project has received administrative support through the offices of the Dean of Faculty and the Provost, as well as FO&M. However, this support was mainly for the initial preparations for launch in 2008 (Loeb, 11 May 2011).

The Computer Science department and Neukom Institute have been major supporters throughout the project's development and implementation (Loeb, 11 May 2011). The Neukom Institute has also been helpful in funding other student projects that have been inspired by GreenLITE, such as Qian Qian Zhao's project focusing on residential water usage (Zhao, 30 April 2011). While these administrative and academic entities have been very supportive throughout GreenLITE's duration, Loeb observes that support from the Office of Residential Life (ORL) has been "tricky" (Loeb, 11 May 2011). Support from ORL comes in the form of the maintenance of monitors and the encouragement of student hall representatives to reinforce information about the program.

Loeb reports that the project is mostly student organized at Dartmouth and that students "drive it", but this year, there has not been as much participation relative to previous years (20 May 2011). The participating students do not represent a wide range of academic departments; the vast majority are studying computer science. Unlike other campus projects, GreenLITE does not regularly report to a higher administrative entity– TellEmotion, Inc. reports to its clientele and adjusting to their different demands, and of course falls under relevant state and federal business regulatory structures. Currently, Loeb is the primary representative of the project, and she works with two other personnel to keep the company running smoothly.

Loeb indicated that the funding for the project has varied throughout its lifespan. Initially, the project received a $20,000 grant from the Provost and Dean of Faculty (Loeb, 11 May 2011). Following that grant, the project received funding from the Morgan Family foundation through alumna Mary Finnegan (Loeb, 11 May 2011). Another major contributor was alumnus Jake Winebelle, who specifically gave funding to the College for sustainability-related, "real world projects that could have a business aspect" (Loeb, 11 May 2011). This donation provided incentive for GreenLITE to become TellEmotion, Inc, as well as about two years' worth of funding. Since then, the project has been supported by individual students' time, as well as by continual development of the program through the business model of TellEmotion, Inc. So far, all revenue from the company has gone back into maintaining and developing the program.

Despite sustaining enough funding to continue operations, GreenLITE has not been able to expand on the Dartmouth campus due to the high initial costs of monitors and other equipment.

Impact

GreenLITE has had a clear impact on the student population. Since its implementation, Loeb has noticed that overall energy use in the nine participating dorms and buildings on campus (including the Native American House, the Sustainable Living Center, and McNutt) has been reduced by an average of 10%, with some dorms achieving anywhere from 14% to 42% reduction (Loeb, 20 May 2011). Loeb hopes that this project will continue to change behavior and attitudes, and that it will help students become more concerned about climate change. The program has contributed to the College's overall commitment to become more sustainable by raising awareness of climate change issues (GreenLITE Tuck Website, *Why It Works*). GreenLITE also helps to make the College more accountable for its energy sources.

Due to a larger movement for businesses, schools, and households to take more responsibility for their energy usage, GreenLITE has begun to have these same sorts of impacts beyond the Dartmouth campus (TellEmotion, Inc Website, *Benefits*). The expansion to other schools and the incorporation of TellEmotion, Inc. have helped the project successfully move into the national sustainability scene.

From what Loeb and the students explained, however, reception of the project has been inconsistent across the Dartmouth campus. This could be partially due to the states of the monitors in some buildings; at least three of the monitors (in the SLC, NAH, and McNutt) are either turned off or disconnected as reported by individuals either residing in or visiting these locations. Such conditions clearly affect the overall effectiveness of the project, as studies have indicated that 80% of the students using the system look to the physical displays on a regular basis for energy use feedback (TellEmotion, Inc Website, *Why It Works*).

Although the project has received both campus-wide as well as national recognition for its innovative approach to sustainability, student knowledge of and response to the project has been limited. Loeb describes how at the project's start, the GreenLITE team was able to hire personnel to disperse information about the systems to residents of the dormitories and the greater Dartmouth community. The primary mode of communicating to students about the project was through residential floor meetings, but student attendance at such meetings has

varied. Rather than attempt to promote the project, the team chose to focus on developing the program instead (Loeb, 11 May 2011). This decision has resulted in the project's relative obscurity on campus. Outside of Dartmouth, however, the project has had much more success and support at certain institutions. This is evidenced in its recent expansion to Miss Porter's School, where Loeb notes support and interest from students and administration have been substantially higher than at Dartmouth (Loeb, 11 May 2011).

On campus, most of the support and awareness for the project has been generated by word of mouth, particularly from students who worked on the project (Lei, 7 May 2011). Zhao, who based her Neukom Scholar project on the GreenLITE program, expressed interest when she discussed the research behind the computer-to-human interaction (Zhao, 30 May 2011). Similarly, despite not knowing at first exactly what the project entailed, Sonia Lei became more interested as she interacted with it (Lei, 7 May 2011). In both these cases, students had little knowledge of the project prior to working on it.

The major driving forces behind the GreenLITE project appear to be the collaboration between a professor and her students, and logically related research. While GreenLITE did start out as part of an individual student's senior thesis, it gained momentum when the faculty member provided the resources and passion needed to make the project a reality. Many have pointed to Loeb as a central figure in operating GreenLITE since its inception (Zhao, 30 May 2011; Lei, 7 May 2011). Her role as a faculty member in this project has been undisputedly crucial to the project's success.

Studies that focus on human behavior are necessary to understand what can change human attitudes and actions in order to increase sustainable behaviors, and more abstractly to combat climate change. For example, fear-based information has characterized much of the discussion about climate change. These methods have proven to be counterproductive, however, because individuals receiving information become habituated to fearful messages (Spence & Pidgeon, 2009). Spence and Pidgeon (2009) note that although fear-based information will initiate action, it will do so only "as long as individuals feel they have some degree of control to act" (Spence and Pidgeon, 11). Hence, these authors and many others advise using "emotive messages alongside positive, credible steps which people themselves can take" (Spence and Pidgeon, 11). In the same vein, Jonah Sachs advocates that storytelling can be a powerful resource for presenting information to people. He attributes the power of storytelling to the fact

that it occurs in a smaller, more personal space, as opposed to methods of large-scale "information dumping" (Sachs). In this context, the research behind GreenLITE creates opportune resources for researching what factors motivate change in one's behavior.

The GreenLITE services will continue mainly because of the off-campus success of TellEmotion, Inc. However, whether the service will take firmer hold on the Dartmouth campus is uncertain. Despite having installed monitors and meters in various dormitories and buildings on campus, monitors have either been tampered with or turned off, which limits their utility (Loeb, 20 April 2011). This also defeats GreenLITE's main mission in providing information on real-time energy usage. Loeb reports that more support is needed in the general dispersal of information about the project's importance to the campus residents (Loeb, 20 April 2011).

From the interviews with Loeb and a few of the students who helped with GreenLITE, the most important factors were faculty involvement and applicable research. The adoption of the project by students and professor has added stability to the project's current operations and for any future spin-off ventures. With Loeb as the main figure for the project and its related company, she can represent the intent, purpose and benefits of the program to anyone. Loeb has also assisted by attaining funding, such as from the Morgan Family Fund. These resources have been crucial to sustaining the project.

Research that focuses on the use of storytelling and emotive response could be the missing link in deciphering what can motivate behavioral change among users of the GreenLITE services. Lei notes that the animation makes the viewer empathize with the polar bear's situation, and that such emotional connection could possibly lead to larger, more fundamental changes in thinking and behavior (Lei, 7 May 2011). This is most noticeable amongst the students who worked on the project. Many of the student interviewees expressed interest in exploring similar projects to GreenLITE and to the psychology surrounding individual motivation. Emotional connection is clearly evident in the current institutions actively using the program, like Miss Porter's school, and the Tuck School of Business.

Aspects of Success

In terms of success, GreenLITE's original and continuing objectives have been to change behavior and attitude around energy use, primarily focusing on individual behaviors in the context of global climate change. There are mixed results in terms of success.

On Campus

Accomplishing objectives: The project has met its initial objectives. When utilized, it does have the effect of changing one's behavior and raising awareness of factors regarding climate change. General maintenance of the monitor hardware has been an ongoing issue. There is no mechanism in place to ensure the monitors are maintained or regularly checked. This is an issue that threatens the fundamental purpose of GreenLITE, despite the project's other successes. When equipment is kept in consistent working condition and is fully utilized, the success of the project will be greatly enhanced. At Dartmouth, the project still needs to achieve cultural integration amongst both students and the administration, in order to maintain the physical equipment in working-condition.

Research: Students who have worked on the project directly, or on other related projects influenced by the project, have pursued research and other exploration to increase general knowledge about sustainability. This assistance can provide overall strengthening of GL without having to pressure students into a leadership role. In addition, students can research various aspects of project, which can greatly help GL expand and evolve.

Off Campus

External Support: Despite this report focusing on projects on campus, it is hard to ignore that when implemented at other institutions not necessarily affiliated with Dartmouth, the project has received appreciation and support from both students and administration. This reinstates the unclear reception that GL has received on the Dartmouth campus. But does acknowledge that success can be found elsewhere. However, future efforts should focus on further endorsing GL to the Dartmouth campus.

Business Model: TellEmotion, Inc. is a successful spin-off from GreenLITE, and this is a direct result of a student-initiated project. Both GreenLITE and TellEmotion, Inc. provide a needed service to the growing sustainability movement. Furthermore, TellEmotion, Inc. demonstrates the possibilities that sustainability-related projects can achieve from humble beginnings. Such achievement can be used to encourage other projects to brainstorm new initiatives.

Case Study – Sustainable Living Center

Description

The idea for the Sustainable Living Center (SLC) was initially conceived during the early 1990s, and over the years there were many different visions for a sustainable campus residence. It was intended to be a new housing option run by students, focused on providing not only an opportunity to *educate* students about sustainable living, but also to *immerse* students in the practical application of such. However, these initial proposals never gained enough traction or support to become a reality until 2007, when an organizing group finally formed, thanks to the concerted efforts of a small cadre of very dedicated students (Sustainable Living Center website, *History*).

The group of students that would end up founding the SLC discovered previous plans for the house completely by accident. A few of them were preparing to participate in an activist march from the Dartmouth Organic Farm to the Green. While searching for cardboard at the farm with which to make placards, they came across a piece of poster-board on which had been written some basic objectives of a sustainable residence for students. The students discovering this information immediately became passionate about the project, according to farm manager Scott Stokoe. They asked why they had never heard of the plans for the SLC before then. Stokoe provided the students with the information he had from previous planning exercises and discussions. From this happenstance (re)start, the SLC organizing group formed with a core of an estimated 12-15 students. Meetings were quickly organized, and soon grew into weekly gatherings of 30+ interested students. (Stokoe, 11 May 2011)

The SLC was sited in North Hall and associated with the College as an "affinity house." This places it under the same governance as sororities and fraternities, language and ethnic housing, and other diverse residential options. The building's unique characteristics today include: worm composting of food scraps in the basement; utilizing solar panels on the roof that provide part of the house's energy; and sourcing house food as locally as possible, even occasionally from the Dartmouth Organic Farm. This shared space and the small resulting community is a microcosm of sustainability on a campus otherwise operating in a broadly unsustainable manner. Just on the other end of campus are a #6 fuel oil-burning power plant – producing heat and some electricity for nearly all campus buildings – and dining halls where the majority of food waste produced by students is simply thrown away.

In the mission statement set out by the SLC's founding members, several explicit objectives are delineated. The SLC is intended to be:

- Focused on education for both students and other community members
- Readily accessible to all students and faculty
- Self-reliant regarding energy consumption; input/output minimization
- Designed, developed, and operated by students
- Community-oriented (within the house)
- Highly involved with the Dartmouth community

(Sustainable Living Center website, *About*).

The SLC was summed up as "a household that would be a venue for experiential learning in regards to sustainability, an educational resource for the broader Dartmouth community, and a place that would allow residents to practice a lifestyle of minimal environmental impact" (Sustainable Living Center website, *About*). More succinctly, and perhaps reflecting the present-day focus of SLC, current head-of-house Christopher Magoon explained that the goal of the SLC was "to provide a community environment in which sustainability-minded people can live and interact" (Magoon, 7 May 2011).

Magoon referred to the SLC as "initially an experiment" which has survived, but "does not really seem to be thriving" (Magoon, 7 May 2011). When asked whether the stated objectives of SLC had been accomplished, he pointed to specific in-house projects that contribute to sustainable education: a food co-op program, which includes sharing meals amongst SLC residents, and when possible, a small amount of seasonal food brought from the Dartmouth Organic Farm; worm composting of food scraps in the basement; physical plant monitoring of water and electricity use; and public programming, including a weekly "Dessert and Documentary" at which local foods are served and a movie related to sustainability is shown. However, Magoon also expressed concern that the "Dessert and Documentary" in addition to previous house endeavors that incorporated public involvement in sustainability education had diminished in recent months, and that advertising and communications regarding these is not as effective as it once was. He attributed this lack of campus awareness and public involvement to

heavy student involvement in other extra-curricular activities, as well as the demanding nature of Dartmouth coursework. (Magoon, 7 May 2011)

Scott Stokoe, Dartmouth Organic Farm manager and one of the very few faculty or staff members that were directly involved in the early days of the SLC, made similar observations. Stokoe applauded the continued existence of the SLC, but felt that funding and institutional support were lacking. He also mentioned the worm composting and reductions in energy consumption as positive developments, but pointed out that opportunities were being lost that would have better promoted the primary objective of the SLC as an institution for sustainability education. One example of such a shortcoming he cited is the location of the solar panels used for water heating. "How much better would it be for the solar panels to be on the ground, where you could walk up to them, [interact with them, and examine them in detail]?" he asked. "We have the second largest solar panel array in the Upper Valley, and no one really knows about it." (Stokoe, 11 May 2011)

Magoon's critical examination of the SLC may reflect current attitudes in the house, but there is clear evidence that enthusiasm regarding the house goes beyond its current residents, as reflected in the application data in the chart on the next page showing application numbers always well exceeding available spots in the house. This would seem to indicate that communications from within the house to the rest of campus are the main culprit in recent programming shortfalls. Stokoe, on the other hand, brings up a point regarding educational priorities. However, it is likely that the solar panel was placed on the roof for a very clear reason – it would generate the most power there, uninhibited throughout the day as shadows travel across the ground he suggested as its alternate site.

Timeline

The SLC website states that it became an official campus residence in the North Hall building during Fall term 2008 – a time frame from conception to realization of approximately 14 to 17 years, with "early 1990s" assumed to be sometime between 1991 and 1994 (Sustainable Living Center website, *History*). However, if we look solely at the founding group of students, their discovery of the placard was during spring term of 2007. Ignoring the duration of time spent on previous planning attempts, this would give us a time frame of just 1.5 years from project conception to realization.

The timeline of SLC housing-related events appears in the following chart:

	Winter Term	Spring Term	Summer Term	Fall Term
2007		Old SLC plans found at Dartmouth Organic Farm. Mission statement work begins.[1]	SLC mission statement drafted. Talks with key administrators begin. Search for physical plant begins.[1]	North Hall building chosen for SLC housing.[1]
2008	Student organizers opt for affinity housing admission process for fall 2008.[1]	SLC application process instituted.[1]	30 applications for 18 spots in house.[1]	(No data).[2, 3]
2009	(No data).[2, 3]	(No data).[2, 3]	24 applications.[2]	37 applications.[2]
2010	35 applications.[2]	41 applications.[2] 28 applications received* by SLC.[3]	20 applications.[2] House closed for summer*.[3]	52 applications.[2] 45 applications* for 18 spots.[3]
2011	47 applications.[2] 28 applications* received by SLC.[3]	51 applications.[2] (No data).[3]	21 applications.[2] 17 applications* for 18 spots.[3]	39 applications.[2] 33 applications* for 18 spots.[3]

[1] (Sustainable Living Center website, *History*).

[2](Office of Residential Life, 16 May 2011)

[3](Viavant, 13 May 2011)

**Note: The Office of Residential Life (ORL) application numbers include all applications for SLC residence, which includes applications where SLC may not have been students' first choice residence. Maya Viavant's data refers to applications actually passed from ORL to SLC, as some students were prioritized to non-SLC housing.*

Actors

According to Stokoe's estimate, there were between twelve and fifteen students composing the "core" of the SLC organizing groups in 2007. However, planning meetings would regularly see attendances of over 30 students. These additional students consisted of a fluctuating body of supporting student volunteers and other interested parties, many of whom gave what time they could, but for whatever reason were unable to commit "full-time" as the core group had. Aside from the student planning groups, main actors at the initiation of the SLC project included Stokoe himself (then, as now, manager of the Dartmouth Organic Farm), and Andy Harvard, then Director of the Outdoor Programs Office. (Stokoe, 11 May 2011)

A Professor of Engineering at Thayer, Benoit Cushman-Roisin, "was also an integral member of the original team... [assisting Stokoe] with establishing criteria by which to rank the houses under consideration by [ORL]" (Sustainable Living Center website, *History*).

Today, there are 19 beds in the house (though not all spots are filled term to term due to last-minute housing changes and cancellations), and the students occupying these are the main actors in SLC endeavors. Student support seems to exist outside this new "core," especially as seen in the application data above, but not in the active popular numbers seen previously at past SLC programming events (Magoon, 7 May 2011).

Supporting actors include members of the newer Office of Sustainability (mainly Rosi Kerr, Director of Sustainability, and Jennifer Pollock, Presidential Fellow), and Joshua Hartman, Affinity Housing Community Director within the Office of Residential Life. Prior members of the house and other students do occasionally take part in SLC programming, such as when the house hosts guest speakers or other events. These sometimes occur in conjunction with the Dartmouth Organic Farm due to their symbiotic relationship and shared goals of promoting sustainability awareness. However, the number of such supporting non-resident students waxes and wanes, and is therefore difficult to quantify (Magoon, 7 May 2011).

Governance & Funding

The internal governance structure at the SLC is relatively simple. Two student residents act as heads-of-house, while the rest of the occupants are each tasked with specific day-to-day duties regarding the maintenance and upkeep of the house and its related programs.

The external governance is more complex. The SLC falls under ORL, directly under the authority of Joshua Hartman, Affinity Housing Community Director. Hartman reports to Brian Reed, Acting Associate Director of Residential Education. Reed reports to Jeff DeWitt, Acting Director of Residential Education.

As modifications to the physical plant must obey all related town ordinances, the SLC also falls under the authority of the Town of Hanover's Zoning Board. This is not a common issue though, as physical modifications to the plant have not been significant since the installation of the solar panels – in fact, energy and hot-water use reductions have been accomplished almost entirely by in-house behavioral shifts (Dreissigacker, p. 30).

Funding for the SLC is non-specific, since the organizing student group opted for affinity housing status. That is, the house receives its funds per term from ORL in the same way that all other affinity houses on campus, which is one reason why modifications to the physical plant have not been forthcoming. One exception to this is the solar thermal system installed at SLC, enabled by an outside donation directed specifically for that purpose.

Stokoe looks towards the future with hope, stating that, "it would be great if there were new funds coming forward to provide support, staffing and programming for the environmentally active and aware students on campus. The affinity housing model allows this program to survive. What is needed is a plan to make it thrive" (Stokoe, 16 May 2011). While the SLC receives adequate resources for its continued existence, the institutions within which the SLC exists do not currently encourage growth or expansion. Our group feels this is counterproductive, especially in light of the significantly higher demand for sustainable housing than for which current house capacity provides. Also of note is that the current affinity housing process for residing in SLC requires a formal application process; this barrier to entry surely obscures greater demand across the student body for living in more sustainable residences.

Impact

The Hanover community outside of Dartmouth has not been significantly affected by the SLC, according to Magoon. Students generally support the project, and there has not been "any real resistance to the project." Rather, a lack of enthusiasm outside of SLC residents, and a lack of effective communications from within the house, tended to keep SLC initiatives separate from the rest of campus and from the rest of the community for the time being. (Magoon, 7 May 2011)

Stokoe recalled the “tremendous student support early on”, with over 30 students at each of the 2007-2008 SLC planning meetings. He noted that no faculty or staff members live in the house – an example of another missed opportunity, but also of future potential for the SLC to improve its educational and sustainability standards. (Stokoe, 11 May 2011)

Without greater institutional support, the SLC receives just enough funding to maintain its residence in what is often viewed as one of the “lower-quality” residential plants on campus (Magoon, 7 May 2011; Stokoe, 11 May 2011). In this way, our group feels that the SLC has become less about improving and educating about sustainability on campus, and more a point of advertisement for the College simply due to its existence. As such, the house has had limited impact on campus. One thing that has been done effectively is promotion of locally sourced foods. With their handful of meal-centric programs, the SLC may play a significant part in this, but it is unclear how much of this effect is directly attributable to the house, as opposed to Stokoe's avid support and the greater institutional influence of the Dartmouth Organic Farm, as well as the subsequent initiatives by Dartmouth Dining Services in promoting their own increasing commitment to local foods.

The student body is almost exclusively the segment of Dartmouth culture impacted directly by SLC initiatives, though the house does occasionally provide a meeting place for some guests of the college, professors, and visiting lecturers. Magoon believed that the SLC, “has become an institution... transcend[ing] the people living there”, and that its continued success will derive from the SLC residential community and their efforts to, “pass on [the project] to the new classes” (Magoon, 7 May 2011). However, it is clear that without continued and increasing support by the wider Dartmouth community, the SLC will remain in its current state of stagnation.

Stokoe, when prompted about the outlook for the SLC, maintained optimism and emphasized the great potential for the project. He recalled a visiting professor from another institution who had discussed the sustainability culture on campus requiring a “hearth” to which it can gravitate and around which it can revolve. He envisions the public areas of the SLC – its first floor and basement – as this potential fulcrum for all things sustainable on campus. Currently, SLC is nearly “just beds,” but it could grow beyond its minimal existence value to become a center of campus culture. Stokoe pointed to three things that would enable the SLC to thrive in the future: 1) some sort of non-student staffing, even if just one person, 2) increased

funding in order to enable greater educational opportunities and improvements to the physical plant, and 3) increased integration of the SLC and sustainability in general into all aspects of campus culture. Without these, Stokoe remains concerned that the SLC will lack the ability to provide effective programming, and become "just another house". (Stokoe, 11 May 2011)

From what we discovered in the course of studying the SLC, our group would tend to concur with Stokoe's outlook. A permanent staff member in the SLC could handle logistical concerns and promotion of house programming, while also acting as an in-house guide for its residents and visitors – a much more accessible support structure than currently exists. Increased funding would allow for expansion beyond mere existence, and the eventual conversion of other residences to immersive sustainability experiences. Not only would this provide greater educational opportunity to the Dartmouth community, but also the lessened resource consumption related to sustainable living practices would lead to real economic benefits by the College. Finally, greater integration of the SLC into campus culture could promote sustainable practices in all dormitories on campus, influence student behaviors, and see results beyond the 19 or so SLC residents that can actually live in the house each term.

Aspects of Success

The only fair way to judge the SLC is by its own standards: in measuring the progress the SLC has made toward meeting the objectives set forth by its founding members.

Focus on education: The SLC has certainly focused on educating its own members, but its effect on the broader student body is arguably small. As we have learned, programming events open to the campus do occur, but are not well promoted and do not attract large numbers of participants. All those interviewed for this study agreed that the broader community – especially beyond the College, that of Hanover proper – do not interact with the house.

Accessible to students and faculty: In the course of this study, we found the SLC to be open and welcoming. At the same time though, accessibility is related to awareness, and campus awareness of SLC events and resources seem limited.

Input/output minimization: While self-reliance regarding energy needs is a distant dream, the SLC has succeeded in reducing its consumption by encouraging students to forgo mini-refrigerators and take short showers. The installation of solar panels has helped alleviate energy

use directed toward water heating. Lack of forthcoming funding from ORL has limited other physical plant improvements that would help the SLC toward this goal.

Student-run: The house continues to remain wholly student-operated. However, this inherently imbues house management with the same limitations placed upon students – time and effort put into house improvement must come after involvement in classes, student employment, and other extra-curricular activities.

Community-oriented within the house: This is the one clear success of the SLC. The house is a strong, if insular, student community. Students residing there share meals on a regular basis, discuss sustainability initiatives, and have been making an effort to organize group trips to volunteer at the Dartmouth Organic Farm.

High involvement with the Dartmouth community: Again related to issues of awareness on campus, while individual members are, the house does not seem to be strongly involved with the Dartmouth community at large. Occasional lectures and dinners are hosted at the SLC, but beyond the small groups in attendance at such events, these could hardly be characterized as "high involvement".

In measuring it so, we find that the SLC is a mix of success and failure, embodying both the limits of its available funding and resources, but also great potential for future growth and development.

Case Study – The Big Green Bus

Description

The Big Green Bus is an organization made up of Dartmouth undergraduate and graduate students united under the banner of promoting sustainability by touring the continental United States in the summer with a coach bus converted to run on waste vegetable oil (WVO). In 2005, fifteen Dartmouth Ultimate Frisbee players founded the Big Green Bus in an effort "to spread information about alternative fuels and environmental and social responsibility through the Ultimate Frisbee community" (2005 Big Green Bus website, *Our Mission*). The BGB members believed that the world's dependence upon fossil fuels necessitated a shift to alternative energy sources, which are already readily available. In addition, they wanted to show that a small group

of dedicated individuals could effect positive change in the world and to work with the Ultimate Frisbee community to inspire individuals to work towards change in their own communities.

In 2006, the Bus altered its mission to specifically target "the youth demographic as our nation's future decision makers and bearers of the consequences of present policy and actions" (2006 Big Green Bus website, *Our Mission*). With this new target audience, the BGB abandoned its emphasis upon Ultimate Frisbee as one of its expressly stated key goals, although many of that year's members were Ultimate players and the Bus continued to stop at several ultimate tournaments during its cross-country tour. The goals of the Bus further evolved in 2007, to include the goal of attracting "high-profile media attention in the communities we visit in an effort to spark a national dialogue" (2007 Big Green Bus website, *Our Mission*). From the website of the 2011 Big Green Bus:

"Our mission is to help create a future that sustains people, the environment, and the economy. We promote awareness and enthusiasm for sustainability through the sharing of information and innovation."

Timeline

According to the Big Green Bus's informational pamphlet, the idea for the Bus was first conceived on the sidelines of a New England Ultimate Frisbee tournament during the spring of 2004. The idea of a cross-country road trip was brought up, but once it was agreed upon that taking five cars to drive across the country would not only be economically and also environmentally wasteful, the idea of converting a bus to run on waste vegetable oil emerged.

Since 2005, every single year has seen the creation of a new Big Green Bus with an entirely new crew. Selection of a new Bus crew takes place in the fall term, with several info sessions followed by the selection process, overseen by two General Managers.

The project is continuous and ongoing, and seeks to establish particular goals on a year-to-year basis that it hopes to complete by the end of the trip. For example, 2009's crew of the Big Green Bus oversaw the transition from the previous 1996 International school bus to a refurbished 1989 MCI coach bus to serve as the new Bus, which required extensive engineering work to retrofit the engine to accommodate vegetable oil in addition to the addition of solar panels, deep cycle batteries, and a Direct Current to Alternating Current inverter.

Actors

The principal main actors of the Big Green Bus were the fifteen Dartmouth students involved with the project from the start. All except for one were members of the Class of 2005, and they were all teammates and close friends on the Ultimate Frisbee team for four years. Four members of the Bus were Engineering Sciences majors, which aided the Bus in tackling the formidable task of converting the conventional diesel school bus to run on waste vegetable oil.

The students involved split up responsibilities into several different categories, including General Manager, Engineering, Finance, Logistics, Outreach, Publications, Treasurer, and Videographer. Although the students had a variety of diverse skills and academic interests, their unified purpose and cohesion demonstrated the power of community that the Bus was attempting to demonstrate.

"While we may be quite the eclectic group of friends, we do not identify ourselves by these differences. Rather, we identify as important members of a greater body working together in community to further a common goal. From engineering a fuel conversion system to documentary film-making, from researching grant opportunities to planning the logistics of a 7 week road trip, we are confident that the combination of our scattered skills have the potential to accomplish just about anything when focused toward one vision. This is the strength of our community; this is The Big Green Bus!"

—2005 Big Green Bus Newsletter

Governance

Two General Managers, who may or may not have gone on the Bus the year before, lead the Big Green Bus. New managers are chosen by the previous year's General Managers. They are responsible for oversight of the entire Bus and all operations that apply to it. In the fall, the current and past year's General Managers review applications and are in charge of selecting the crew for the BGB.

However, it is often a challenge to convince students to take on the role of being a General Manager. Although the title and prestige of leading such a campus organization is often enough to attract leaders to the position, Rory Gawler, Assistant Director of the Outdoor Programs Office, cited the BGB as an example of an organization where the burden of responsibilities associated with being a General Manager exceeds the prestige of the position

itself, leading to a lack of interest in taking on the role of General Manager on a year-to-year basis. The responsibilities of the Bus are split up into a variety of different committees, such as Finance, Logistics, and Outreach, each of which is led by its respective Committee Chair.

Gawler serves as the Bus's advisor. He provides support and advice as needed, but strongly believes that the Bus's value lies in being entirely student-initiated and student-run. Although he has the final say in executive decisions that involve the College, Gawler tries his best to not intervene with the student managers. He will only step in if he believes that people may be subject to physical harm or if the Bus will lose money.

The Big Green Bus exists as a largely autonomous campus organization, but is subject to the same oversight as other student groups. The Big Green Bus, like the Dartmouth Organic Farm and the Sustainable Living Center, are covered under the umbrella of the Outdoor Programs Office. Gawler is the first step in the chain of command all the way up to the Board of Trustees:

- Rory Gawler, Assistant Director of Outdoor Programs Office
- Brian Kunz, Deputy Director of OPO
- Dan Nelson, Director of OPO
- April Thompson, Associate Dean
- Sylvia Spears, Dean of the College
- Carol Folt, Provost of Dartmouth College
- Jim Yong Kim, President of Dartmouth College
- Trustees of Dartmouth College

(Gawler, 13 May 2011)

According to Gawler, on occasion, College administrators will provide recommendations based off of information provided to them, such as a recommendation regarding the transition from the school bus the BGB previously utilized to the coach bus in 2009. The College felt that part of the appeal and value to the Bus lay in the "old-school" nature of the school bus, and that the transition to a "slick" coach bus would detract from its overall value in addition to being expensive. However, the coach bus had many advantages in terms of size, comfort, and utilities

over the school bus and after Gawler and the members of the Bus argued that the change was necessary, the transition was initiated.

Funding

The majority of the funding for the Big Green Bus comes from corporate sponsorships. In the Bus's inaugural year, a majority of their corporate sponsorships were obtained by making "cold calls" to companies and businesses, although the Bus has evolved to send out sponsorship packages to potential sponsors. According to Gawler, the Bus will target companies with sustainability projects. Waste Management, one of the Bus's first and most important sponsors, has contributed around $100,000 to the Bus since its establishment. This year, the Bus has been the recipient of various donations from various companies in the form of solar panels (SunPower), a bamboo floor (EcoTimber), grease filters (Rosedale Products), and computer cases (Act 2Greensmart). Additionally, several high-profile companies have signed on as sponsors, such as Boloco, L.L. Bean, Light My Fire, Waste Management, and ClifBar.

In addition to corporate sponsors, the Bus has received financial support from a variety of different actors and organizations. Amongst these organizations are the Dartmouth Outing Club, which provides support in obtaining bus driver certification and with camping fees on the road, the Thayer Engineering School, and the Environmental Studies Program.

In addition, the Ultimate Players Association (now USA Ultimate) provided the Bus with a 2005 Ultimate Innovation Grant in the amount of $500. According to the USAU website, "the goal of this program is to stimulate the development of innovative ideas for ways to develop the sport or implement new solutions to challenges facing the Ultimate community" (USAU Website, Innovation Grant Program). However, grants are a minimal aspect of the program's total funding.

Impact

The Big Green Bus has been one of Dartmouth's most visible and well-known sustainability projects. In contrast to the majority of the student-initiated and student-run sustainability projects at Dartmouth which focus on intra-campus sustainability initiatives, one of the main objectives of the Big Green Bus is to attract national attention through the media and at the grassroots level. In addition to keeping up a weblog while on the road, members of the BGB

have been interviewed and featured in local and national newspapers, magazines, and television programs. This publicity has helped keep Dartmouth in the sphere of universities with a strong focus on sustainability.

According to Rory Gawler, the Big Green Bus is the "best educational opportunity on campus" due to the fact that it is project-based and entirely student-initiated (Gawler, 13 May 2011). For Gawler, the motivation that spurs student-initiated programs is the presence of intrinsic motivation such as genuine passion and interest in advancing sustainability. Gawler argues that the presence of extrinsic motivators in the academic realm such as grades and economic success only serve to dampen true education. The social cachet (i.e. the social status that comes with being a member of the Bus on campus, embarking on a summer-long road trip) associated with being involved with the Big Green Bus is the closest thing to extrinsic motivation that the Bus currently has.

The project-based nature of the program is a study into the importance of experiential education. "We're actually doing something, with real-world constraints," Gawler said. "Unlike so many things, there are real consequences [of your actions]" (Gawler, 13 May 2011). He cited the example of the failure to follow up with a potential sponsor leading to the loss of previously accounted-for funding. Additionally, the networking skills developed in the process of doing public relations work for the Bus can help students in their future career path. According to Gawler, Saulius Kliorys '05, one of the founding members of the Bus, is currently employed by Great Lakes Brewing Company (a minor sponsor in 2005) as their Director of Sustainability.

Aspects of Success

The Big Green Bus is seen as one of the most recognized sustainability projects on campus and one of the more well-known college sustainability projects in the nation. It has enjoyed high-profile media attention from national news outlets such as ABC's Good Morning America and USA Today, in addition to coverage from local newspapers and television news stations (2006 Big Green Bus website, *News & Media).*

Using De Wit's definition of success, it is necessary to measure the Big Green Bus's completion of the objectives that it set out to accomplish in its inaugural year. The 2005 Big Green Bus's Mission is as follows:

The Big Green Bus project was created to communicate the following ideas:

1. *The world's increasing dependence on fossil fuel consumption necessitates research in and a quick transition to alternative energy sources. The Big Green Bus shows that fuel alternatives are available for use right now.*
2. *Even a small group of dedicated individuals can effect positive change in the world. The Big Green Bus aims to stimulate environmental action in communities across America.*
3. *We are all in this together. The Big Green Bus is a small community of motivated individuals reaching out to the Ultimate Frisbee community in the hopes that affected individuals will in turn work toward awareness and change in their greater communities.*

(2005 Big Green Bus website, Mission)

1. The Bus serves as a fully functioning example of the current viability of alternative energies to supplant fossil fuels, particularly in the field of transportation. The Bus has, with varying degrees of success, been able to complete the cross-country tour every year from 2005 to 2010, and as a result has been able to demonstrate that WVO powered vehicles are viable.
2. The phrase "stimulate environmental action" is difficult to define, and it is even more difficult to be able to quantify causal relationships between the Bus's influence in the towns and cities it has passed through during its tours. As a result, it is difficult to determine success in this regard.
3. In terms of communicating the idea that the Big Green Bus is a community of motivated individuals reaching out to the Ultimate Frisbee community, it is similarly difficult to measure awareness in the population of Ultimate Frisbee players that are aware of the Bus's existence.

However, it is important to note that the Bus's mission has changed from year to year as each successive crew seeks to develop its own specific goals and objectives to accomplish by year's end. For example, the Bus's shift away from a focus upon Ultimate Frisbee communities in 2006 demonstrate that the Bus's overall success as a program cannot be measured against the objectives set in 2005, but instead, an evaluation of the Bus's year-to-year success of if the goals of the Bus established in the fall term have been reached by the end of that year's tour in the following summer.

CONCLUSIONS

Throughout our case studies we have noticed that our initial criteria of objectives, actors, governance, and impact provide insight into the creation and implementation of these projects. In

this section we analyze if these categories result in significant factors for project success. We investigated each category to find any overall similarities or differences. As a result our criteria for studying these projects have provided significant input towards the success of future projects on the Dartmouth campus. These steps and considerations are a part of our "Recipe for Success."

Objectives

In our investigation into various student-run projects we found that the presence of definite objectives have been an important determinant of the project's overall success and evolution. We compared each project's initial objectives with their current objectives as to demonstrate and analyze how the initial objectives can create a needed foundation and how the modification of the objectives over time can greatly add to a project's success. The initial objectives for each project are summarized as follows:

Projects	**Big Green Bus (BGB)**	**GreenLITE (GL)**	**Dartmouth Organic Farm (DOF)**	**Sustainable Living Center (SLC)**
Purpose	*Educational space *Hands-on *Social space *Living space	*Educational purpose *Interaction through computer technology	*Educational space *Hands-on *Research	*Educational space *Hands-on *Social space *Living space
Actors	Student run		Student run	Student run

By observing the initial objectives we are given the essentials that helped create these various projects. Through interviews, we gained an understanding of each project's initial stage and later stages. It was important to understand the development process, to observe what the project is like today, and what past modifications have enhanced the overall project. In general, the initial objectives seem to characterize each project in accordance with their primary focus: i.e. the SLC provides housing for sustainable-minded students, the BGB travels around the US in a bus powered by alternative fuel, etc.

Today each project's objectives remain much the same from the initial implementation. However, some modifications have been developed as the projects evolved. For instance, the BGB was initially geared towards spreading awareness of alternative fossil fuels and sustainability through the game of Ultimate Frisbee and its community. The SLC was initially in its earliest form, supposed to house students who wanted to live closer to the organic farm. In order to achieve the initial objectives creative programming has also been utilized. For example, as to further develop its mission to provide information on the links between behavior and energy use GL was expanded into the business realm by starting TellEmotion, Inc. The spin-off business was founded in 2009 to extend the service to interested entities outside of Dartmouth. The SLC and DOF have implemented programming geared towards developing the social aspect, such as "Documentary and Dessert," or hosting musical performances, etc. This demonstrates that despite specific initial plans, projects can evolve as well as be enhanced to achieve objectives.

Another aspect is that three out of the four projects provide spaces for students to physically do activities related to sustainability. For example, students on the BGB learn how to use alternative fuel to run a bus; students on the DOF can learn to grow various produce, etc. In this sense these projects go beyond just discussing sustainability issues. The projects become well known on campus and this may have helped with the general survival of the various projects over the years. In addition to providing "learning by doing" projects, BGB and SLC have also become more energy independent by relying on alternative methods of energy production, such as using alternative fuel or solar panels. In contrast, GL has not generated participation by hosting events, such as some of the other projects have. Instead GL has accomplished fiscal independence through a business model and has successfully separated from dependence on Dartmouth. Such expansion has helped GL to achieve its goals, but mainly from outside of the Dartmouth campus.

Finally, while all the projects in some way involve students, from our analysis it appears that the BGB and SLC are generally considered the projects that students will actively interact with. The DOF has a history on campus, but due to the low rate of returning student helpers it is unclear how it will continue without more participation. Nonetheless, it is also the project that has a fairly successful academic aspect in that the Environmental Studies program has created a

class utilizing the farm's resources. GL, on the other hand, appears to be somewhat unknown to the student culture, which may continue to affect the amount of student involvement.

Overall it appears that there is no clear indicator for project success within aspects of project objectives, except that when creating the project, the objectives need to be met by both a mixture of programming and overall completion of the project's nature e.g. travel around talking about sustainability, organic farming, etc. Nonetheless what has helped has been:

- The uniqueness of a project does increase its chance of success, particularly when recruiting possible future student helpers. This helps ensure the project's stability and survival. The nature of the project may also bring attention despite its status amongst students such as in the cases of the DOF and GL. While these projects may both be lacking in student participation, they are surviving due to other external factors such as a central power figure, or other means, like a business model.
- The nature of the project affects its success: DOF, SLC, and BGB all require a change to a person's lifestyle while participating in those spaces, whereas GL is a tool that could lead to change. Therefore an emphasis on change may be a precursor for success.

Alongside the objectives in a project, other factors like student initiation, uniqueness and an emphasis on change determine the success of a sustainability initiative.

Actors

A key process to our case study methodology was identifying significant actors in the conception and realization of each sustainability initiative. These are the members of the Dartmouth community most directly involved in campus environmental improvement, by choice and/or by profession. As such, they have a great impact on the outcome of the projects: the community awareness of these and the continuation and development into the future. Detecting trends in the nature actors allows targeted institutional cultivation of potential actors for future sustainability initiatives.

The lack of direct administrative involvement in these projects was significant. Administrators were usually identified as supporting actors rather than main actors, publicly announcing their approval of a student suggested sustainability initiative, but actually doing little other than this. Other actors that were interviewed cited their concern regarding this gap in participation and accountability. This has contributed to the present health of the programs

involved – as in the case of both the Dartmouth Organic Farm and the Sustainable Living Center, whose funding has remained stagnant since inception.

Associated with this dearth of administrative support, faculty and staff directly involved in these projects were extremely limited in numbers. Regarding main actors, both GreenLITE and the Dartmouth Organic Farm involve only one main faculty/staff actor each (Laurie Loeb and Scott Stokoe, respectively). The Sustainable Living Center enjoys the support of Scott Stokoe as an advisor, but his major duties are at the organic farm. The Big Green Bus is wholly student-run, with only minor advising from members of Outdoor Programs.

An argument can be made that both the limited administrative and faculty/staff involvement in these four case studies may be an inherent quality of the student-run nature of the case studies we chose to examine (with the exception of GreenLITE, which is primarily run by Loeb and follows a business model). However, this argument is necessarily weak, especially when considered in light of the Dartmouth Organic Farm. The farm has been used as a selling point in College advertisements since shortly after its formation. Yet, with the ENVS-25 course and freshman trips, among others, dependent on its flourishing, it has only one full-time staffer. We find that this indicates lack of significant investment in such sustainability projects by Dartmouth, fiscally, culturally, institutionally, and otherwise. These projects must move beyond mere existence value for the College in order for them to expand and grow, and actually improve campus sustainability in a significant way.

More positively, we found the number of student actors involved in each project to be encouraging. GreenLITE had five core students involved in its beginnings. A core of 12-15 students founded the Sustainable Living Center. Similarly, 15 students started the Big Green Bus. The Dartmouth Organic Farm was founded with about 30 interested students. These numbers tend to vary, but it is evident that each project was not founded by individual actors, nor were they the result of large masses of students that would indicate temporary and unsustainable cultural shifts.

In this way, only a relatively small percentage of students – 0.125% to 0.75% of the student population, (assuming the undergraduate body to be an even 4000 students for simplicity)– need be mobilized and enthused to get such sustainability projects from original idea to fruition. We will admit, however, that all indications pointed to these core groups of students at the heart of each initiative undertaking tireless efforts in order to realize their projects, and that

these efforts must be perpetuated at a similar level in order for the projects themselves to perpetuate. Looked at another way, as small a proportion as one out of every 800 students can have a positive and significant impact on overall sustainability education, awareness, and realization at Dartmouth.

We find the data and observations collected on the actors in the campus sustainability initiatives suggest the following steps to improve the likelihood of success of such projects:

- Develop a method for identifying students who are passionate regarding sustainability matters, so that energies are not wasted on individual students that are less likely to contribute to sustainability initiatives.
- Create institutions that encourage these select students to pursue such initiatives. Their assistance to the College comes unpaid, and only requires specific project funding, representing a major economic advantage over professionally-generated projects.
- Increase administrative involvement in such projects. The current state of this involvement does not tend to represent a significant investment by the College in sustainability initiatives. Outspoken support is great; planning guidance, increased funding, and increased number of hours spent on the project are all more directly useful to project success and growth.
- Provide staff and faculty to guide and assist students in their sustainability projects. Student passion has its limitations, and due to the nature of required course loads, employment to pay for tuition, and other extracurricular activities, student actors will benefit from the involvement of dedicated individuals that do not experience these limitations.

Governance

Information on the governance structures both internal and external to each project included the regulatory and support mechanisms required for the initiatives to survive. However, due to the significant variations we observed amongst the governance structures in each of our four case studies, it was difficult to determine which, if any, structures specifically influence a given project's survival.

Scott Stokoe, the farm manager, heads internal governance at the Dartmouth Organic Farm. Reporting to Stokoe were student interns that vary by term. Next, in line are interns, are all

of the volunteers that travel to the farm in order to assist with its operations. The Sustainable Living Center is managed by two student heads-of-house. Under these two, the rest of the residents are each assigned various tasks of lesser authority. To student leaders also manage the Big Green Bus. Under these two are a few committee chairs, in turn followed by the rest of the student participants in the program. The GreenLITE program has of course deviated from the other Dartmouth sustainability projects, which was the result of a the donation it received requiring it to become a business interest. As such, it now follows a business model of governance. As CEO, Laurie Loeb runs the company, while two assistants assist her.

External governance is similarly variable between the four case studies. Stokoe of the Dartmouth Organic Farm works directly for the Outdoor Programs office, and reports directly to its director, Dan Nelson. The Big Green Bus also falls under the auspices of the Outdoor Programs office, specifically that of advisor Rory Gawler. However, Gawler reports to deputy director Brian Kunz, who in turn reports to Nelson. The Sustainable Living Center, was once housed under the same office, but has since been relocated to the Office of Residential Life under the guidance of affinity housing community director Joshua Hartman. Brian Reed, associate director, is next up the chain, and he then reports to ORL director Jeff DeWitt. GreenLITE again provides an exception to College governance, and it operates as an independent corporation.

Thus, each project has either two or three tiers of internal governance structure, and up to three tiers of external governance structure (in relation to the program office of which it is a direct part). The chains of command appear to vary by project. However, we can speculate about top tiers of internal structure. The existence of two authoritative heads in each of the completely student-run groups – the Sustainable Living Center and the Big Green Bus – may be significant. We can guess that this provides these groups with increased leadership resilience, as student volunteers are from time to time pressured by their commitments to their coursework, employment, or other extracurricular activities to temporarily forgoe their project commitments. This is in opposition to the professional-run Dartmouth Organic Farm and GreenLITE program, which each have one full-time head guiding their development.

Impact

How the four sustainability projects have impacted the Dartmouth community has been varied and diverse. The Dartmouth Organic Farm, a project with an expressed educational focus, and as such the Farm had led to the creation of ENVS 25, an Ecological Agriculture class offered every summer. The class conducts its laboratory sessions at the Farm and remains one of the most popular classes at Dartmouth. The Farm has inspired other sustainability projects such as the Sustainable Living Center, which was established in 2007 by a group of students involved with the Farm. The students were interested in creating a sustainable residence on campus. The Farm also provides fresh organic vegetables to the local community through its weekly co-operative, serves as a social space for students and provides an educational opportunity during the DOC Freshman Trips. The Farm also generates publicity for Dartmouth as an institution with an interest in agriculture.

Project GreenLITE initially led to a 14% decrease in energy usage in participating dormitories, as well as increased awareness by providing real-time, easy-to-interpret, accurate data on student energy usage. Furthermore, as a corporate institution that has extended beyond the range of Dartmouth College, it has spread this technology to outside institutions in addition to driving technology in the field of real-time energy usage monitoring systems.

The Sustainable Living Center, as an affinity housing program located within the Office of Residential Life, serves as an alternative residential option for undergraduate students seeking to live sustainably with like-minded students. Its physical presence on campus, along with the events that it hosts serves to increase awareness of sustainability issues on campus and provide social spaces for students to come together. Additionally, the Center reduces energy usage, water use, and waste flows when compared to conventional dormitory housing, and provides hands-on experience in sustainable living that students can utilize in the future.

As perhaps the highest-profile sustainability project studied, the Big Green Bus serves as one of the most nationally recognized waste vegetable oil (WVO) vehicles. It serves as a symbol of the viability of the alternative energy movement. It provides an important educational opportunity for the students involved (including engineering work/maintenance, outreach, etc.). Furthermore, the skills needed to acquire and maintain corporate sponsors contribute to corporate networking skills that can be instrumental in the professional world. It also serves as a source of campus prestige and culture.

The oldest project was started in 1997 (Dartmouth Organic Farm) and the most recent was instituted in 2007 (the Sustainable Living Center), many of these projects are all relatively new projects. They have all had significant impacts in a variety of different ways, and it remains to be seen what further impacts they may have in a future with a rapidly increased focus on sustainability. In addition, the possibility of further growth and expansion of each of these projects signify a new realm of possibilities within Dartmouth College in the context of the Sustainability Strategic Planning Process that will be completed by the end of 2011.

Recipe for Success

As a result of our analysis we have decided to compile a list of what we consider significant actions and/or considerations for future sustainability related groups to complete in order to become fully operational. Four of the recommendations are based on common themes that we observed from our analysis. First, we list information to support the theme then we list the recommendations in relation to that theme. These themes range from possible offices that future projects can be housed under to deeper considerations about how to connect the project with staff.

Outdoor Programs Office

Three of the four projects that we studied are in the Outdoor Programs Office (OPO). We do not conclude that a sustainability project will succeed if that project is administered under the OPO, but we do find that OPO supports a lot of student-founded initiatives related to sustainability. We did not interview any staff member from the OPO program but from the information we've gathered about the organic farm, the big green bus and the SLC, they all seem to agree that they get a good amount of support from OPO. Consequently, we recommend that future projects related to sustainability should seek to be administered under OPO. Nonetheless, we question if OPO can take on more projects or if some portion of their mission needs to be modified in order to accommodate more projects, if they so wish. Such adjustment may change how OPO views itself in terms of projects, thus other sources of support may be needed as well.

As part of a possibility that OPO may overlook too many projects that vary in focus, we contend that our suggestion to have future projects administered under OPO might limit OPO's resources. If this became the case, we suggest that future projects should consult with OPO for advice on project administration. GreenLITE, which is not administered by OPO demonstrated a

different path of implementation under the Computer Science department. This is mainly due to the project's programming nature, yet the project has shown that a different can be used for getting a project implemented and working is possible under a different administrative office.

Recipe Recommendations

- During the early stages of formation, the founders should have a good idea of what the program needs are, and which department would be most appropriate for the project to be housed in

- When planning a project it may be helpful to scope out the "scene" around the particular sustainability focus, in order to avoid overlap with other endeavors. It would also be helpful to identify other similarly focused organizations to explore future collaborative endeavors

Governance structure observations

In the Big Green Bus and the SLC projects, we observed that they have a common governance structure: two student leaders and a passionate group of about 15 students. The two student leaders are important because Dartmouth students are busy and often engage in multiple activities so having two student leaders gives resilience to a project – when one is busy, the other leader takes over responsibility. Additionally, we find that involving a passionate group of students is vital for the survival of a project. This group of students not only feels a sense of ownership to the project but they feel that they have a responsibility to keep the project growing.

With the student participation it appears that the social "prestige" status and general "busy" working nature of these projects requires that whoever is chosen to lead these projects must demonstrate a variety of skills in order to carry on the project. Most importantly, the leaders must demonstrate to their fellow peers the importance of their roles to accomplish the general mission of the project. Accountability to the mission is demonstrated by the continuation of the project to incoming classes. This is demonstrated by the abilities of students who have held leadership roles in the BGB and SLC. These projects reflect great student interest that reinforces "sustainability is important" (Joe's group).

Accountability can also be created by branching out from an original project to other projects; for example, Qian Qian Zhao sought the programming of GreenLITE for her project

that brought a different aspect of GreenLITE to a different audience, and on a more personal scale. Such branching out may help create more interest and bring more attention to the original project. Building on various student interests in various aspects of sustainability could also be attributued to the start of the other projects. The SLC was founded to satisfy the interests of a group of students who wanted to live as a community while learning about sustainability. The organic farm was founded because there was an interest from students to have a farm where students would learn sustainable agriculture.

Recipe Recommendations

- Before a project is started, its founders should first identify what the students are interested in, and then make sure the project satisfies that particular interest.
- The projects should use the two-man leadership structure with a support of a small group of passionate students in order to start projects.
- The projects should create and advertise opportunities (internships) that connect academic and practical participation i.e. data monitoring/computer programming with GL, being a DOF intern, etc.
- Encourage and support the student leaders' immersion with the existing sustainability project in order to create a resiliency, and develop a network of communication for sharing about the project both internally and externally.

Need for a project on campus

From our studies we found that there's a big demand from students to learn about sustainability. For instance, the SLC receives more applications than its capacity, while ENVS 25 consistently has a long waitlist. Future projects should try to find a sustainability project that will fulfill demand. The ongoing project organizers could petition the administration to increase support (e.g. in funding) for projects that have limited resources to fulfill existing demand. It is clear that the SLC could be expanded if the SLC had a bigger dormitory. ENVS 25, which is partially taught at the farm, could benefit from increasing the class size, or course offerings in multiple terms. It is also clear that the four projects have had some degree of success because of their novelty. For instance, GL has demonstrated this by providing a new approach to resource monitoring, and as a result has met demands beyond campus, and thus it has grown in it's own

way. By providing a project on campus that would benefit campus as well as fulfill a niche it would greatly increase the project's overall success and appreciation on campus.

Recipe Recommendations

- Develop a way to identify student needs/interests on campus, especially as related to sustainability, and design projects around those ideas:
    - What would students participate in?
    - What would they be willing to do?
- Demand for more attention and support from the administration for help with budgets, especially when demand exceeds capacity
    - If demand exceeds capacity within projects, consider designing a new sustainability initiative to involve less budget needs
    - If an increased budget is impossible, find other ways to achieve your results
        - If a new project is created, the project can merge or collaborate with another project
        - Consider resources/groups already existing on campus, and explore how they can be co-opted for sustainability initiatives (i.e., the student investment group could focus on alternative energy or green investments exclusively)

Consider the timeline of existing projects on campus

During our analysis of these four, fairly recognizable sustainability projects we realized that although each project has its own list of frustrations in relation to its role on campus, each project is still developing both internally and externally. Internally, each project is still learning how to sustain operations and how to recruit new people to the project. Externally, the projects are dependent on how the college's system operates and on the college's willingness to appropriate necessary resources, Basically, these projects did not happen overnight, they took a fair amount of planning. For instance, the organic farm had to be planned for in terms of location, facilities, staff, and academic department appropriation. A similar story is also seen in the implementation of the SLC. These projects require a balance of both student initiative and comprehension of the college's management structure.

Recipe Recommendations

- Realize that there are differences between a student's timeline (about four years) and the college's timelines when considering how things get done
- Learn how the college's bureaucracy works, in order to find out how to accelerate the process
- Consider every detail possible as to create a blueprint for future students to continue the implementation of a project

APPENDIX – Item 1

"Recipe for Success" Group – Interview Form

Introduction

My name is ____ and I'm a member of the Environmental Problems and Analysis Course, ENVS 50. In the class, students work in groups to formulate and justify policy measures that they think would be appropriate to deal with a local environmental problem. This year, our class is creating a tool kit that will support the efforts of the Learning and Culture working group of Dartmouth's recently initiated Sustainability Strategic Planning Process.

Our group is researching sustainability projects at Dartmouth that we believe have helped progress sustainability at Dartmouth in the past couple of decades. Among these projects are the Dartmouth Organic Farm, the Sustainable Living Center, the Big Green Bus and the Dartmouth GreenLITE project. Our goal is to eventually develop a "recipe of success" by drawing conclusions from the results of our research in order to help students in starting and implementing future projects from scratch here at the College.

We have been conducting research by reading past ENVS reports, correspondence, newspaper articles and other sources of information that is currently available. As part of our research, we are interviewing those who were instrumental in the early organization and implementation of these projects to develop an understanding of the circumstances surrounding each.

We intend to gather information from the following questions from Lorie Loeb (GreenLITE), Scott Stokoe (Organic Farm), Rory Gawler (Big Green Bus), and Jennifer (Sustainable Living Center). We plan to ask them to either fill out this survey or to meet with us in person to discuss these questions, whichever is most convenient for them. We will do our best to find answers to as many of these questions as we can on our own and ask the interviewees the rest. The following questions constitute a comprehensive list of the information that we'd like to gather by the end of our discovery period.

- Main actors: how many? What position did each hold?
- Supporting actors: how many? What position did each hold?
- Funding: how much? From whom?
- Length of Time: from project conception to realization
- Public Sentiment / Awareness: at time of project
- Relevant Governance Structures: at time of project
- Goal: objective(s) of each project? Objectives accomplished?
- Impact: on students? Other community members? Benefits?

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Chapter II: Sustainability within Dartmouth Sub-Culture

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I. Introduction

Dartmouth has a very specific set of cultures and communities, ranging from an influential Greek system to a top-notch academic population. The goals of the following section are to identify large Dartmouth communities and groups and to define what it means to be sustainable within them. In the end, the section is meant to give the Culture and Learning Working Group a better understanding of the structures and cultural attitudes of these campus

communities. With this knowledge, the working group will be given a recommended set of standards to follow when addressing sustainability within each "mini-culture" and will be able to create an effective sustainable solution to the problems identified.

The following section has chosen to focus on two of the largest campus communities: Dartmouth Athletics and the Greek system. While the Dartmouth campus cannot be summed up in two communities, of all the communities on campus, the Athletic Department and the Greek system encompass a breadth of people from all different corners of campus. The Athletic Department encompasses students and administrators alike. There are sixteen Division I Varsity teams, twenty-eight Club teams, and over twenty intramural leagues across campus. Over 75% of students participate in some form of athletics on the varsity, club, or intramural level ("Student Groups & Programs," 2010). In terms of the Greek system, over 60% of eligible students (those who are sophomores and older) choose to be affiliated with Greek organizations ("Frequently Asked Questions," 2010). The members of these groups are deeply involved in a wide range of campus groups and extracurricular activities outside of these two particular groups, and any sustainable change to these students' mentality and lifestyle might permeate positively into the other campus groups its members are involved in.

II. Methodology

II.a. The Athletic Department

We tried to capture both broad and specific views of the relationship between athletics and sustainability by using a combination of research methods. In order to capture the widest spectrum of different sports, we sent out a brief, anonymous survey to the team captains of all thirty-two Varsity sports. The Survey asked questions about team missions and values, current actions towards sustainability, and potential drawbacks of incorporating more sustainable practices into their organizations. We have rated the reported actions teams take towards sustainability on a scale of zero to three. Zero denotes no indication of any activity designated towards sustainability. We have based the other levels on the amount of activities each team participates in from the following self-reported list: picking up trash, recycling, reusing water bottles, consciously conserving electricity, moderating equipment use, and participating in car pools. Level 1 (Trivial) means the team contributes to one or two activities, Level 2 (Moderate) shows a commitment to three to five activities, most notably car pooling. As a baseline for future

use, Level 3 (Complete) means that the team operates under a guideline of sustainability. This last group would also potentially be willing to cut back on travel in the name of sustainability.

In order to get a more in-depth perspective from individuals at various levels within the athletic department, we conducted in-person interviews with a non-random, but diverse, set of individuals intricately involved with athletics. We chose to interview the athletic director, varsity head coaches and assistant coaches, facilities employees, and club and varsity student athletes in order to capture as wide a scope of the athletic department as possible. For these interviews, we felt that linking the response to the individual's position within the athletic department would be useful for gauging the potential impact of their responses; therefore, these interviewees are not anonymous. With these non-anonymous interviews, we were careful to respect the "human subjects" involved in our study by informing them that: their participation was completely voluntary, and we would respect any interviewee's decision to discontinue questioning at any time. While it would be useful to include all their names and positions with their responses, if anyone wished, his or her response could remain anonymous (Whiting, 2008, p.39). Before directly quoting interviewees, we would confirm their statements with them to make sure they were not misrepresented.

All of our subjects agreed to these conditions and we proceeded with our questions. When conducting the interview, we started by establishing a comfort level by asking questions about the person's role and the mission of his or her team or department. We then proceeded to introduce the concept of sustainability by asking straightforward questions about current practices before moving onto more complex questions about ideas going forward and potential drawbacks. We concluded the interview by giving the subject the opportunity to ask any questions he or she wished of us or to suggest any other information he or she wished to relay to the Sustainability Strategic Planning Process.

With the interview and survey results in hand, we aggregated the data to determine general trends about current sustainability practices within the athletic department, and attitudes towards change concerning sustainability. We also organized and presented sets of ideas and concerns and developed recommendations going forward.

II.b. The Greek System

As a majority of our research into the Greek system was based on interviews, our first step was to identify potential interviewees. As Siedman (1998) says, "How best to select participants who will facilitate the ability of others to connect if random selection is not an option? The most commonly agreed upon answer is purposeful sampling" (p.45). We specifically chose certain people for our interviews and therefore do not have a random sample for our research; instead, we spoke with people who would be the most relevant to our set of questions.

When choosing participants, we tried to speak with Greek house managers and sustainability chairs (if applicable) because they are the members that would be most aware of the actual sustainable actions within their own houses. For example, these actions could include how waste is disposed of, how the house operates in general, and so on. We preferred to speak to students in those positions who are now seniors, because they would have the most experience in those roles and have the most knowledge on the subject of sustainability within their Greek houses (Whiting, 2008, p.36). However, if those members were unavailable for interviews, we chose to speak to underclassmen with those positions. We also wanted to talk to other Greek members who were not involved in environmental issues, which included students who were not Environmental Studies majors or minors and were not members of any of the green groups on campus. We chose these interviewees from people we already knew who fit these necessary qualifications. We attempted to interview at least one member from each Greek house, although this does not include Greek organizations that do not have physical plants. The members of these organizations live in dormitories, but our study focuses specifically on whether Greek houses operate sustainably or not, and looks at the attitudes of the members of those Greek organizations. It should be noted that, while we only interviewed students from Greek organizations that had houses, some houses are college-owned, while others are not; the up-keep, repairs, and other issues concerning college-owned buildings are taken care of by the College.

During these interviews, we applied specific, uniform techniques in order to ensure that the interviewees were comfortable and were willing to speak truthfully with us. First of all, because these were semi-structured interviews, we made sure that we scheduled the interviews ahead of time and found quiet locations to speak with the participants. We also recorded the conversations (Whiting, 2008, p.36). Secondly, Nurs (2000) suggests that the "researcher should say as little as possible" (p.75) and that he "listens more than he talks, and listens with a sympathetic and lively interest" (p.77). We tried not to say too much when asking our

predetermined questions, but we did react appropriately to the participants' responses by engaging in relevant dialogue. Thirdly, when there is a "non-hierarchical relationship between interviewer and interviewee," the participant is more comfortable speaking with the interviewer, since they have equal social status (Ibid., 2000, p.76); we attempted to use this technique in our interviews. When interviewing people involved in athletics, it was difficult to establish a "non-hierarchical" relationship because we, as students, were speaking with coaches, facilities managers, and the like. However, when interviewing Greek members, it was very easy to eliminate the hierarchy because both the interviewer and the interviewee were students who were members of Greek organizations. In this way, we as interviewers were not outsiders and were actual members of the Greek sub-culture (Nurs, 2000, p.81). Along with social hierarchy, we tried to take into account the age and gender of our participants (Whiting, 2008, p.36). For the most part, male interviewers spoke with male Greek members, while female researchers spoke with female Greek members. Fourthly, before we conducted the actual interviews, we made sure to explain the purpose of the interview to our participants, as well as the purpose of the digital recorders, and we gave them the approximate length that the interviews would take (Ibid. 2000, p.37). Afterwards, we thanked our interviewees for their time, and made sure to "state that all participants have the right to privacy, anonymity, and confidentiality" (Ibid., 2000, p.39). A final technique concerning interviews is to start out the conversation with an open-ended question (Ibid., 2000, p.37) so that the participants are given the chance to speak freely about a topic that particularly pertains to them. The first question for our interviews was written in such a way that the interviewees could expand on their own thoughts about the subject at hand (See Appendix). By applying these techniques, our interviews were semi-structured and professional, and our participants were at ease when speaking to us and when answering our questions.

III. The Athletic Department

III.a. Introduction

The Dartmouth Athletic Department encompasses three-quarters of the Dartmouth undergraduate student body through thirty-four varsity sports – sixteen for men, sixteen for women, and two coeducational programs– along with thirty-four club and twenty-four intramural sports. All varsity athletic teams compete in NCAA Division I, some in the Ivy League conference and others in the Eastern Collegiate Athletic Conference; many teams travel to

compete mainly in the northeast, though some travel across the country for championship competitions. The Athletic Department acknowledges the campus visibility of the program and its students and is therefore dedicated to not only maintaining standards of conduct on the field, but also in all parts of campus. Because of the nature of this visibility, the department expects athletes to provide a strong example of good role models.[1]

There are twenty-two athletics facilities under the department, although only fourteen are directly on campus in the sports complex.[2] The college has dedicated $85 million to facilities improvements since 2000. With the exception of the new baseball complex, all of the spending has gone towards renovating existing facilities.

III.b. Results

III.b.1. Survey Results

We created a survey that was sent to all varsity team captains in an effort to find what the teams' missions incorporated and whether sustainability was a part of those missions. The survey also questioned what teams are currently doing, if they have any future plans for sustainability and whether they see any drawbacks to incorporating more sustainable practices in the Athletic Department.

The survey (see Appendix) was sent to sixty-seven people and we received fifteen responses (See Fig. 2.1). The teams that responded include eight men's teams, four women's teams and one co-educational team: Men's Squash, Tennis, Golf (2), Baseball, Swimming, Track and Field, Lacrosse, Lightweight Crew and Women's Swimming, Cross Country Skiing, Volleyball, and Field Hockey and Sailing.

Many of the missions of these teams point to the importance of excelling both on and off the field. Many interviewees state that they wish to win a title in their respective sports, have fun, maintain a high level of integrity and sportsmanship, and also balance their academics. Zero of the fifteen survey respondents stated that sustainability is a component of the mission of their teams. However, many of the athletes have pointed to the possibility and willingness to incorporate it.

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[1] Mission Statement: http://www.dartmouthsports.com/ViewArticle.dbml?DB_OEM_ID=11600&ATCLID=584939

[2] Dartmouth College Facilities Links, Accessed: May 15, 2011

When asked what the team is currently doing for sustainability, eight of the teams said that they do not do anything. In addition to the eight teams that received a score of zero, sever teams scored a 1, and no teams scored a 2 or 3. (See Fig 2.2) Most teams do not have any plans for implementing further sustainable practices. If they have stated in the past that they would like to implement something, such as shorter shower times, they have not followed through with their plans. Responses to the perceived drawbacks of implementing further sustainable practices fell into five categories: 1) No Drawbacks, 2) Unsure, 3) Difficulty of changing habits, 4) Competition Quality, and 5) No Response (See Fig. 2.3).

Five teams point to no drawbacks of incorporating sustainable practices. Three teams were unsure of whether there are drawbacks. Three teams pointed to the difficulty of incorporating new practices and changing habits, perceiving their teammates as being apathetic towards sustainability. Specific negative implications mentioned in the survey pointed to quality of competition, through a decrease in travel and management of facilities. Less travel means a decrease in exposure to the best competition. For the cross-country ski team specifically, they idle their bus in order to keep warm before and after races. The discontinuation of this practice could lead to a disadvantage in their ability to compete well. The golf team called attention to the necessity of the course upkeep; a low quality course could detract potential students and competition from coming here.

Figure 2.1: Captain's Sustainability Survey Results

Team	Sustainability in Mission?	Team Currently Doing?	Level	Future Plans?	Level	Drawbacks to Sustainability?
Baseball (M)	No.	Nothing.	0	No.	0	None.
Cross Country Skiing (W)	No	Recycle; Clothing swaps; turn lights off both in locker room and on trips.	2	Stop preheating the sauna.	1	Not flying to races and camps; not exposing to best competition Not idling = colder before and after races.
Field Hockey (W)	No	Team water bottles; use Blackboard instead of printing plays	2	No.	0	More effort; hard to start new habits.
Golf (M)	No	Equipment. Recycle older balls.	1	No? Points to course management; do best as community to conserve resource usage.	0	Quality of golf course; detract players from coming here.
Golf (M)	No	Nothing.	0	No.	0	None.
Lacrosse (M)	No	Nothing.	0	No.	0	Time, efficiency and comfort – team members are apathetic to sustainability.
Lightweight Crew (M)	No	Pick up trash; close windows; shut off fans/lights; recycle	2	No.	0	None mentioned.
Sailing (Co-Ed)	No	ISCA - no more plastic, non-reusable bottles at competitions. Deal with Klean Kanteen. Team enforces this rule.	1	Unsure.	0	On personal level. Changing habits. Increase in complaints.
Softball (W)	No	Question need of new equipment.	1	No.	0	None mentioned.
Squash (M)	No	Nothing different from any other team.	0	No.	0	Unsure. Not relevant.
Swimming (M)	No	Nothing.	0	No.	0	Didn't answer.
Swimming (W)	No	Nothing.	0	No.	0	Unsure.
Tennis (M)	No	Recycle Tennis ball cans and bottles.	1	No.	0	Unsure.
Track and Field (M)	No	Nothing; some team members incorporate.	0	No.	0	None mentioned.
Volleyball (W)	No	Nothing.	0	Possibly decreasing shower time; no follow through.	0	None.

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Fig 2.2: Actions Currently Taken Towards Sustainability (Captain's Survey)

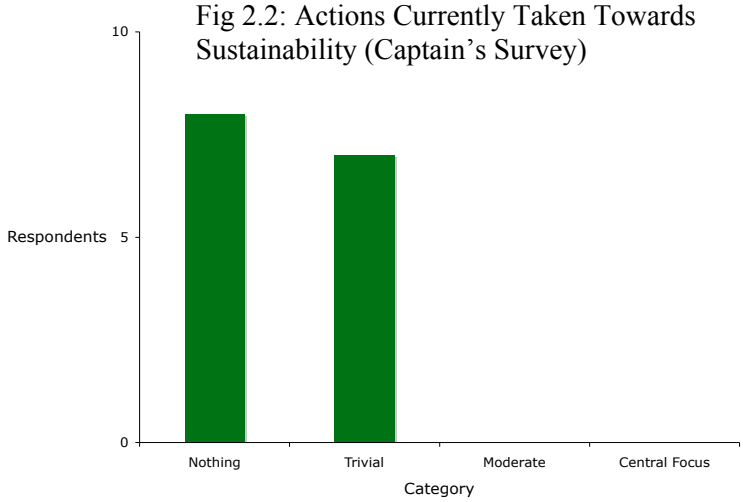
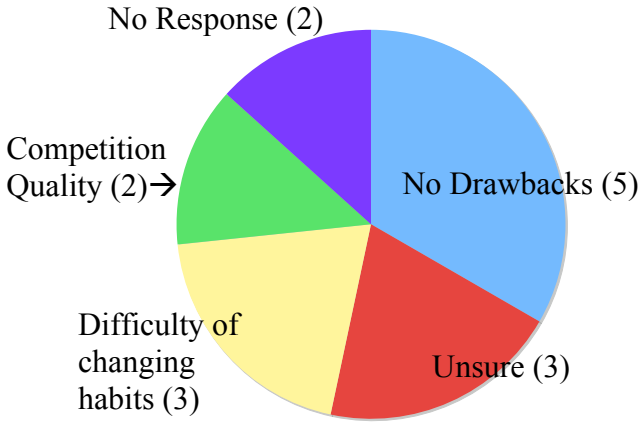


Fig 2.3 Drawbacks of Implementing Sustainable Practices (Captain's Survey)



III.b.2. Interview Data Summary

In order to contextualize the responses of our respondents and assess their potential contributions towards enacting sustainable change in the athletic department, we asked about the respondents' self-perceived roles within the athletic community. Coaches tended to think of themselves as leaders and educators. For example, Chip Knight, the coach of the women's alpine ski team, stated, "As a coach, I'm in a position of leadership of my team. I can have an impact

with regard to action and policies" (personal interview, May 2, 2011). Melissa "Mo" Wiggins, assistant coach of the women's lacrosse team, responded, "I'm an educator and a teacher. I teach not just lacrosse but also life lessons" (personal interview, May 9, 2011). The athletes likewise viewed themselves as leaders. Brett Gilson '13 of the track team described himself as "a role model" (personal interview, May 3, 2011). Athletic Director Harry Sheehy described himself as "a forward thinker" (personal interview, May 9, 2011). From these responses we can conclude that the respondents might potentially be actors for change in their roles as educators and leaders.

To determine the importance of sustainability to the mission of the athletic community, we asked respondents to share with us their teams' missions, or core values. Some teams have winning as their main focus. Knight says that the ski team's core values are "to be the best ski team. Skiing fast and winning" (personal interview, May 2, 2011). Jeff Keller '14, of the baseball team, says the team's mission is to "win the Ivy League Title as a team. As individuals, get to Major League Baseball" (personal interview, May 4, 2011). Other teams focus on broader goals that still include winning. Buddy Teevens '79, the head football coach, shares that the team's mission is to, "Win football games. Deeper than that, we want to develop leaders, good communicators, people that are supportive of others" (personal interview, May 6, 2011). Matt Nichols '13, of the club cycling team, relates, "It's about having fun, promoting cycling, getting new people involved; trying to be ambassadors for Dartmouth College to the community and Upper Valley. We do everything we can to make the sport affordable and accessible; to promote student leadership. And we want to win!" (person interview, May 6, 2011). According to Wiggins, the core values of the Women's Lacrosse team are: "Togetherness and Teamwork. Us as a group, not as individuals" (personal interview, May 9, 2011). While the Athletic Department also has a formal mission statement (See Appendix), Sheehy speaks of its core mission to "create a generation of leaders using athletics as a vehicle for leadership and accountability" (personal interview, May 9, 2011).

We also asked specifically whether sustainability was implicitly or explicitly part of their teams' missions. While some respondents acknowledged that sustainability ought to be part of their teams' values, only Knight recognized it explicitly. According to Knight, "The sustainability of our natural resources is vital for the future of our program. We rely on snow and cold temperatures to be able to ski. In recent years, without any artificial snowmaking at Oak Hill, there frequently hasn't been enough natural snow to host the Nordic races during Dartmouth

Carnival...But, no, we don't have any major sustainability initiatives in place right now."(Personal interview, May 2, 2011.) For the most part, respondents (ten out of eleven) said sustainability is not part of their teams' current missions.

In order to categorize what teams might be doing for sustainability even if it was not explicitly part of their missions, we asked what teams are doing now for sustainability. Some respondents said that their teams are involved with recycling and other conservation measures. Teevens says [of the football team], "We're pretty good about recycling; using local food suppliers and asking them to use less packaging. We have a 'green' building, and a turf field that doesn't require watering" (personal interview, May 6, 2011). Others acknowledged that their team has a large impact. Knight replied, "We drive a lot. We rely on Vox buses, Sprinters and vans that get 8-20 mpg. We do travel with the whole team together, however, so at least the carpooling effect is large" (person interview, May 2, 2011). Using the same rating system we used for the Captain's Sustainability Survey, three of the respondent's teams received a zero and eight received a one (See Fig 2.4).

Gilson addressed the issue of why teams, and student-athletes in particular, might not be involved with sustainability initiatives, remarking, "Sustainability isn't in people's minds as it should be. There's no incentive towards sustainability. Lots of it is not in our hands. The use of lights is not something that students can really control. It's not incentivized, people feel like they can't do anything. That's why people don't know about it or participate" (personal interview, May 3, 2011). Teams are not currently doing much for sustainability, and, apart from the cycling team's intention to get more involved with promoting bike commuting in the Upper Valley, there are no plans of implementing new initiatives in the near future.

While incorporating more sustainable practices into the athletic department will help make Dartmouth a "greener campus," certain initiatives have the potential to adversely affect the athletic community. In order to get a sense of what aspects the athletic community would worry about in terms of the implementation of more sustainable practices, we asked respondents about sustainability's perceived drawbacks. The consensus among respondents was that sustainability initiatives would potentially be time-consuming, financially costly and might reduce the competitiveness of the department both on the field and in recruiting. According to Sheehy, "Sustainability takes greater attention to detail; and can often involve costs [for example LEED certification]. In competitive athletics, it's hard to do anything unilaterally, because it impacts

recruiting. We need common sense solutions that don't result in competitive inequity" (personal interview, May 9, 2011). Knight is also concerned, noting that, "Cutting back on travel would be devastating. We need to drive and fly to get to training and races. It would be impossible to cut back on that without sacrificing competitiveness" (personal interview, May 2, 2011). Dan Hochman '11, of the Swimming and Water Polo teams, states, "I don't want to compromise the team…cutting in the name of sustainability is always a risk. We need to be progressive, not draconian" (personal interview, May 6, 2011). In light of these concerns, it is important that potential changes be evaluated in terms of their expected impact on costs and competition. Among the eleven respondents personally interviewed, three cited travel and competitiveness as potential drawbacks to implementing more sustainable practices, three cited cost, and five respondents did not identify any drawbacks (See Fig. 2.5).

In order to develop a sense of the role the athletic community might play in making Dartmouth as a whole more sustainable, we asked respondents whether they felt athletics could be a leader in greening Dartmouth. The overwhelming response was "Yes." Respondents commented on the department's size and visibility as reasons why it could be influential. Wiggins remarked that, "Athletics are a big entity on most campuses; I'm certain we could provide a lead on sustainability efforts. Beyond that, administrators and coaches should take the lead on it" (personal interview, May 9, 2011). Teevens notes that, "We have direct access to so many people on campus. If every coach says sustainability is important it could have a big impact" (personal interview, May 6, 2011). Even from this limited sample, the fact that ten out of eleven respondents felt the athletic community could be a leader in greening Dartmouth makes it clear that the athletic community is positioned to have a visible role in campus sustainability.

We also gave the respondents the chance to provide us with any sustainability related general feedback. While most had no comment, Knight commented that, "I don't see a lot of stuff going on. I think it should be more of an issue, more prevalent on campus" (personal interview, May 2, 2011). Sheehy remarked that, "In order to become more sustainable, we need help. We need people who have really put thought into it to give us input" (personal interview, May 9, 2011). Coming from the athletic director, this indicates that the department is eager to play a role, but is uncertain as to how to best accomplish this.

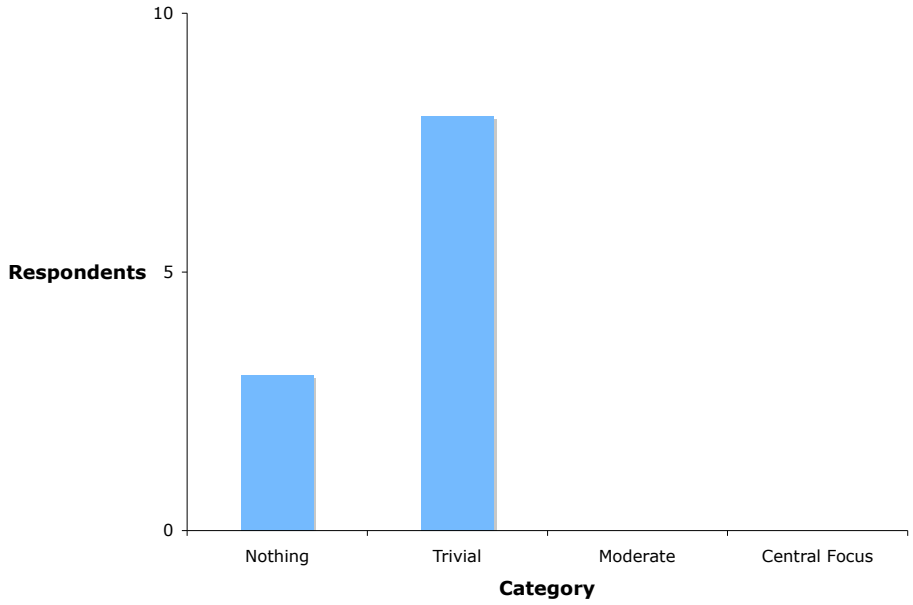
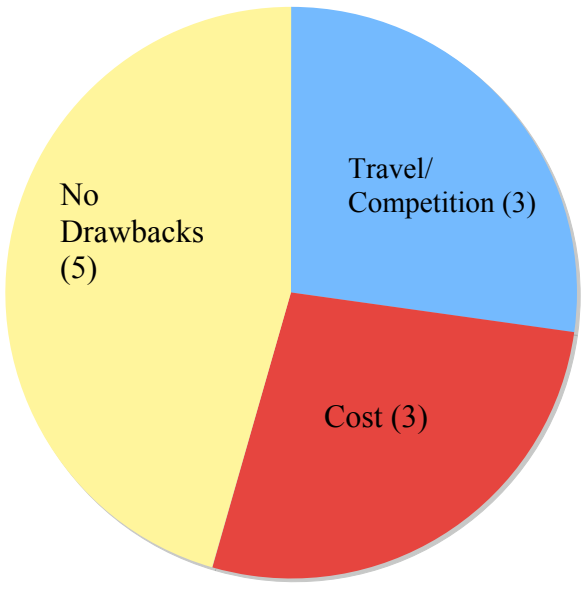


Fig. 2.4: Current Actions Towards Sustainability (Personal Interviews)

Fig 2.5: Potential Drawbacks to implementing sustainable change.



III.c. Recommendations

Perhaps the most direct question was what ideas respondents had for making the department more sustainable. Most ideas revolved around making team travel more efficient and putting on events to showcase sustainability. More extreme suggestions include putting up wind turbines at the Dartmouth Skiway, the purchase of renewable offsets, and a 'Big Green Bus' with bike racks for the cycling team. Knight remarked that, "the Skiway consumes a lot of power, which is an important consideration for sustainability. Sourcing more of our energy from renewable sources, like a wind tower for example, wouldn't take away from the Ski Team at all. There's potentially a big bang for our buck there" (Knight, Chip. Personal interview. May 2, 2011). Teevens suggested "working with vendors to reduce packaging and adjust class and practice schedules to reduce the use of lights" (Teevens, Buddy. Personal interview. May 6, 2011).

A member of the baseball team pointed to the need for making sustainable practices more mandatory. He believes that "if it is voluntary, then teams (and players who think sustainability is not important) will not participate or have a positive attitude for it." He believes that if it is mandatory, then following the notion of cognitive dissonance, players will succumb to this and change their attitudes towards sustainability (Anonymous. Personal Interview. May 3, 2011).

From the responses we received, it is evident that, at all levels, members of the athletic community feel that the department could be a leader in greening Dartmouth. At a basic level, we could make a huge difference in implementing practices to promote a more sustainable lifestyle, such as increasing recycling rates, reusing water bottles, and turning off lights; we can make a large impact in changing the attitudes of student-athletes. It is highly advised to do so in a fun and exciting way. The athletic teams currently participate in a program where they record how many games each team member has attended, and then at the end of the year the top teams are given an award for their school spirit. While it is uncertain as to whether this program is effective, it provides an example of how a competition could be conducted and an effective means of making sustainability a key principle within the athletic community. Another example that other teams participate in is an awareness day, or even season, at games where sustainability and recycling are promoted.

While many individuals have pointed to the potential of the athletics department being a leader in sustainability, this principle is not explicitly a major point of emphasis within team

values or the mission of the department as a whole. It would be worthwhile to explore the implications a mission of leadership has on sustainability, as leadership appears to be a big component of the missions of various teams, as well as to explore the inclusion of sustainability in department and team mission statements.

Numerous respondents expressed concerns with the effect of team travel on sustainability. We therefore suggest that athletic travel practices warrant further, in-depth review in order to both accurately catalog its extent as well as suggest ways to reduce travel and its inherent impacts. We encourage the working group to collaborate with the athletic department administration in order to infuse sustainability knowledge into the department's practices while remaining cognizant of potential drawbacks with regard to cost and competitiveness.

IV. Greek Life

IV.a. Fraternities

A lone trash bag sits bulging at the base of a dumpster. Cups and cans are visible through the clear plastic liner. The occasional food scrap and the grime of the basement mar what would otherwise be a perfectly recyclable bag of plastic cups and cans. The entire dumpster behind it is filled to the brim with similar bags, all filled with recyclable material destined to go to the dump. Above the dumpster in the windows of the fraternity hang A/C units on full blast even though its residents sit idly in class. Light bulbs, left on, quietly hum in an empty room. One does not have to look far to realize the Greek system, and in particular the fraternities within them, has a sustainability problem.

In order to further understand these issues, a series of interviews, each with a representative fraternity member from a different house, was conducted. The purpose of the interviews was to identify problems concerning sustainability within the Greek system, and to see if common themes would arise when talking about sustainability, no matter the house being represented. Ideally, these common themes will help to identify the key factors hindering sustainability efforts within the Greek system. Once aware of these factors, proper solutions can be formatted to address them. Throughout a large majority of the interviews, four themes always stood out: incentives, priorities, a distrust of administrative programs, and potential individual enthusiasm.

The largest and most obvious problem with the fraternity system is waste. When it comes to the problem of waste, the fraternities' waste can be divided into two groups: personal waste and community waste. Michael Katz '12, the sustainability chair of Zeta Psi fraternity, says, "Personal waste largely occurs upstairs and is mostly the brothers' of the fraternity individual waste. Community waste largely takes place in the basement, which is a social space often occupied by people other than the individual members of the fraternity." (personal interview, May 3, 2011). According to him it is easier to recycle the personal upstairs waste as it is often treated as a living space and one's own residential area. However, in the basement, recycling is much more of a challenge as the community waste is often contaminated, making it unrecyclable, and sustainability does not often mesh with the Greek scene. However, according to Bernard Haskell, the Assistant Director of Residential Operations at Dartmouth College, about 90% of the waste produced in a fraternity basement is recyclable (personal interview, May 3, 2011), meaning a lot of the community waste generated in the basement is recyclable material that often gets thrown out. However, the culture surrounding this waste is often discouraging. Jasper Hicks '12, a brother of Psi Upsilon, brings up an interesting point in his interview: "Sororities are more likely to be sustainable because they are not open to campus. It's not just Psi U's trash the brothers are taking care of but most of campus' and we get blamed for it…People are under the assumption that we are now accepting responsibility for other's waste. If the entire campus as a whole came Sunday morning to clean up maybe it would be different" (personal interview, May 6, 2011). On the whole, fraternities are often met with a fatalistic "don't care" attitude towards this waste. Deep Shah '12, the House Manager of Kappa Kappa Kappa says, "Their [the brothers'] main concern is to just get rid of the mounds of trash so we can have a clean basement and pass inspection" (personal interview, May 4, 2011). While eliminating the inherently wasteful nature of the social scene within fraternities is unlikely, if that waste were handled sustainably, then it would not be such a problem.

Another recognized area of concern in fraternity sustainability is energy and water use. At the same time, these are aspects of sustainability that can be easily controlled by the brothers. However, many fraternity representatives believed this was more of an administrative issue. They believed water and energy efficient improvements such as sensor lights and low flow showerheads should come from the College, putting the onus on the administration and not on the brothers themselves. Haskell has admitted that this is on the docket of things to do for

Dartmouth's Sustainability Director, Rosi Kerr; it is not at a top priority right now (Haskell, personal interview, May 3, 2011).

In order for people to recycle and be sustainable, many fraternity members are calling for tangible incentives for recycling. According to Hicks, "Getting people to be sustainable cannot be based on these high minded ideals of sustainability and environmentalism. Some kind of benefit is needed to incentivize desired behavior" (personal interview, May 6, 2011). Of all the fraternities on campus, Sigma Alpha Epsilon (SAE) has one of the leading recycling programs. Nick Devonshire '11, the Social and Programming Chair as well as Sustainability Chair of SAE, attributed the creation of their effective recycling mechanism to the monetary incentive they received by cutting down their garbage pick ups from once a week to twice a month, resulting in a savings of $230 per month. By using the College's much cheaper recycling program, they were able to cut down on the amount of trash placed in the dumpster, which translated to fewer pick-ups and lower costs. In order to get other brothers to realize the potential monetary savings in recycling, this program was sold to them in "frat terms." SAE did the calculations on how much they were saving per month and presented it in tangible forms the brothers could understand, for example, mapping out how many more cases of beer they could buy, or how many more parties they can hold. "It's a coarse way of doing it but it helps put the incentives into terms brothers can understand" (personal interview, May 2, 2011).

However, in an interview with Joey Anthony '12 who attempted to start a recycling program at Alpha Chi Alpha (AXA), he mentioned that no such monetary incentive to cut down waste is available to the fraternity. Since they are college-owned, there is no money saved through higher recycling rates (Joey Anthony, May 4, 2011, personal interview). Since the college controls the fraternity's waste pick-up, the brothers cannot negotiate cutting down the pick-up rate and therefore cannot cut costs. Many fraternities, including SAE, manage their trash pick-ups through Casella Waste. However, college-owned houses, a few privately owned fraternities, and all the sororities run their waste through the college (Haskell, personal interview, May 3 2011). While making fraternities that run through Casella aware of the savings they could incur by recycling could give them incentives to do so, it is not a viable solution for the majority of the Greek System as a whole.

Another problem to incentivizing recycling is that, in the state of New Hampshire, there is no bottle refund for recycling as there is in many other states. Shah states, "I'm shocked there

is no bottle deposit in the state of New Hampshire. If cups and cans translated to dollars, you bet recycling rates would go up within Greek houses" (personal interview, May 4, 2011).

In the past, the College and green groups have tried to enact competitions amongst fraternities in which the house with the most recycling at the end of the designated time-frame wins a monetary prize. These competitions, according to the interviews, have not been very successful. Many houses were apathetic to the cause and barely participated. Others houses claimed to participate but afterwards there was a lack of follow-up and all sustainability efforts tapered off.

When asked about attitudinal barriers to greening the Greek System, all of the interviewees unanimously answered that apathy is the main hindrance. However, some said it goes beyond disinterest. "It's more that just indifference. Sustainability is just not that high on the list of students' priorities" (Chad Hollis '12, personal interview, May 8, 2011). Students at Dartmouth College juggle a rigorous academic schedule while trying to balance that with a plethora of extracurricular activities and an active social life. Most of the time sustainability does not fit or rank highly on the list of priorities. "When a student enters a fraternity basement, it's to blow off steam. He or she does not want to have to worry about things such as sustainability" (Shah, personal interview, May 4, 2011). Even more than that, students often lack the adequate knowledge about recycling and sustainability. Since it is such a low priority for students, they will also rarely bother to remedy this problem.

There is hope for a potentially green Greek system, however. A lot of potential lies in the individual enthusiasm of a brother within the Greek house to design and enact a recycling program within his own house. Interviews have revealed that an over-arching administrative program will not solve the problem. "People just don't want to be told what to do. It would be much more effective if a group of people inside the system brought it up, formed by students to benefit the students" (Hicks, personal interview, May 6, 2011). "While programs such as zero sort and cheap recycling helps, if green initiatives were going to take root," Devonshire states, "they have to come from within, from a brother within one's own fraternity" (personal interview, May 2, 2011).

As shown by the previous statements, sustainability and green initiatives are more readily accepted and adopted when they come from in-house. Affiliated members of the Greek system often voice concern at any initiative handed to them by the administration. There is often a view

that the administration has no real understanding of student life or the student's actual desires; 44% of the students interviewed who are affiliated with fraternities mentioned their distrust for the administration, stating that they were unsure if the College had the fraternities' best interests in mind. This perspective is a huge barrier when asking students to adopt new programs. If a program is introduced by an individual member in the house, it is not viewed with the same perspective as an administrative mandate. Other members have confidence in the fact that the brother who initiated the program has an understanding of house and student culture, and that the program is not designed to radically alter it.

Thus, programs such as Green Team, a student created and run bystander intervention program designed to reduce alcohol-related harm on campus, have been apparently successful. Green Team members, who are in fact students themselves, monitor parties and attend to any alcohol related problems (Rauschenfels). In the weeks following its creation, the Green Team initiative has been largely praised and welcomed by many members and leaders of the fraternity system, largely in part due to trust between students.

There are many advantages and disadvantages to placing the creation of a green initiative in the hands of an enthusiastic brother. Besides the program being more readily adopted, it takes a unique solution and some creative ingenuity for each individual house to become sustainable. SAE raises some of its trashcans with bungee cords and a piece of wood on the wall to prevent vomit (which might be crude to say in an academic piece, but unfortunately is a harsh reality when it comes to contaminating recyclables in the basement) and other potential basement grime from ruining the recycling. It might not seem as official or look as good as an administrative enacted program, but it works well for SAE. Unfortunately, this does not mean the administration can go around installing raised trashcans in order to enhance recycling. Anthony said they tried installing raised trashcans but that it was unsuccessful (personal interview, May 4, 2011) and Max Goldberg of Phi Delta Alpha, concluded that the layout of the fraternity's basement is not conducive to installing raised cans. "However, other options and ingenious programs could be created by someone who has extensive knowledge of the basement, its layout, and its dynamics, namely a brother" (Goldberg, personal interview, May 5, 2011).

There are some drawbacks to a recycling plan made in house. Programs and initiatives have often faded and disappeared, in large part due to the D-plan or because enthusiastic students graduate. "Every once in a while an individual brother comes along and changes the waste

culture for the better, but as soon as he takes an off-term or graduates, the system tends to revert back to its old ways" (Devonshire, personal interview, May 2, 2011). Anthony echoed the same sentiment as he tried to enact a recycling plan in AXA in the fall; the program disappeared during the winter as he was off, and there was no one enthusiastic enough to run the program (May 4, 2011 personal interview).

IV.b. Sororities and Co-eds

While fraternities have constituted Dartmouth's Greek community since 1841 (Dartmouth Greek Leadership Council, 2005), sororities and co-ed Greek organizations are now a large part of that community, too. There are eleven sororities on campus, although only six of them have physical plants, and there are three co-ed Greek organizations, all of which have houses. Of the sororities that do have houses, three are local sororities, which means their houses can be open to campus for parties; national sororities have limited events in their houses, and there must be no alcohol at those events. The sororities are all part of the Dartmouth College Panhellenic Council, the umbrella organization that oversees the activities between sororities and organizes sorority rush every fall and winter (Anna Sonstegard '11, personal interview, May 4, 2011). The co-ed Greek organizations can hold events much like local sororities and fraternities do, and they are part of the Co-educational Council on campus. Within the organizations that have physical plants, there is at least one house manager who organizes the up-keep of his or her house; many of the organizations do have environmentally-focused positions such as Sustainability Chair or Recycling Chair, though the responsibility for these positions differs from house to house, similar to the fraternities. All members interviewed reported that their houses have multiple recycling bins, and now they are zero-sort due to the College's new recycling program. The members of sororities and co-ed Greek houses on campus have similar thoughts on sustainability within the Greek system to those of the brothers of fraternities on campus. They, too, feel that the lack of incentives, the number of different priorities students have individually, and the inherent nature of the party scene on campus are all barriers to making Dartmouth's Greek community sustainable. However, they are optimistic that Dartmouth could make the Greek system more eco-friendly in the future.

For many of the students interviewed, the fact that recycling and reducing waste is not rewarded is definitely an issue. This particularly refers to the sorority houses: since they are

college-owned, sorority members do not have to pay the utility bills directly, similar to students who live in dormitories. Because of this, sorority sisters do not lose money by using more electricity or water, and they do not reap the benefits of conserving those things, either. Sarah Bromley ’11, a sister of the Kappa Kappa Gamma national sorority, says, “ It’s sort of harder to [tell houses that they] have to pay for this stuff, but having some tangible way to say, ‘Oh, we’re doing this better’ or ‘Oh, we’re not doing this so well’ might be helpful” (personal interview, May 4, 2011). While asking sorority members to pay for their utilities in a different way than other college-owned buildings might not be feasible, if there were some reward for conserving energy or reducing water use and the like, these women might change their behavior to be more sustainable since they would be compensated for their actions. When interviewees were asked if a sustainability competition could encourage Greek houses to be more environmentally-friendly, the responses were mixed. Catherine Suarez ’11, a member of the Kappa Delta Epsilon local sorority, says, “In general, people at this school can be kind of competitive; we always like to compete over our houses. [A competition] would be a good way to motivate people who, even if they aren’t necessarily interested in sustainability, they’d want to win” (personal interview, May 3, 2011). This sort of enthusiasm is quite the opposite compared to the responses of fraternity brothers, who did not believe a competition would promote sustainability within their Greek houses. Corbin Burstein ’12, one of the House Managers of the co-ed organization The Tabard, states that the prize for such a contest would need to be “something that could get the attention of frat boys, sorority girls, and everyone in between” (personal interview, May 5, 2011), since this possible competition would need to appeal to all Greek members if it were to be successful. However, there are those who feel that incentivizing sustainable actions may not be the best way to promote sustainability as a whole. The House Manager of the Alpha Xi Delta national sorority, Kim Betts ’12, says that incentives may not be the solution because, “the end goal is to have people want to recycle and want to turn off the lights” on their own (personal interview, May 4, 2011). If rewards were received only temporarily, people’s behavior may not be permanently changed, and they could revert to their past mind-set of not thinking about sustainability. If incentives were established to encourage sororities and co-ed Greek houses to reduce, reuse, and recycle, they would have to be continuous, tangible and enticing to have Greek members become excited about living sustainably.

Priorities are another theme that frequently arose in interviews with sorority and co-ed Greek members, not unlike those with fraternity brothers. Individual students on campus tend to be involved in many different activities, from their classes to their Greek organizations, from clubs to sports, and the list goes on. Many interviewees mention that, with all of the other commitments that students have, sustainability seems to have been placed on the back burner. Anna Sonstegard '11, the former president of the Dartmouth College Panhellenic Council, says, "Sustainability is not as much of a priority as other things…At Dartmouth, we're bombarded with issues that we should and want to care about and raising awareness on a multitude of things. And so, people often feel like they have to pick and choose what they're dedicated to…" (personal interview, May 4, 2011). Students' activities, both within and outside of the Greek community, tend to be hierarchical, and sustainability is usually not at the top. "It [sustainability] is almost drowned out by the many other causes that are being pushed for on campus and it's just another one of them…it's sort of just neutral, not for any reason except for the sheer number of other things" (Bromley, personal interview, May 4, 2011). While sorority and co-ed members might be interested in environmental issues, other concerns seem to take precedence simply because students have so many other pursuits. For those individuals who are dedicated to sustainability, that interest frequently does not translate to their Greek organizations. 45% of all of the students interviewed mentioned that an interest in sustainability is on a more individual basis than that of an entire Greek house, and they are aware that the enthusiasm for environmental concerns "varies from person to person" (Tabard '12, personal interview, May 2, 2011). Rebecca Hellerman '11, the former House Manager of the Kappa Delta Epsilon local sorority, mentions that there are "individual Greeks who are passionate about sustainability" in her sorority, but if a cause were to be associated with her Greek house, "sustainability would not be it" (personal interview, May 8, 2011). Kelly McGlinchey '12, Programming Vice President and the former co-Sustainability Chair of the Alpha Xi Delta (AZD) national sorority, says the same thing for her house: "Myself [sic] and a few other girls in the house are into sustainability and recognize its importance, so I think that in that way there's a presence in the house, but I don't think it's ingrained in AZD as something that's part of the house itself…" (personal interview, May 3, 2011). So, even though there may be individual Greek members who are concerned about the issue of sustainability, many Greek houses as a whole do not share the excitement of being sustainable as those green-minded few.

Just as individual Greek members have many priorities and interests, the same goes for the Greek houses themselves. Samantha Epstein '11, a member of the Delta Delta Delta national sorority, says, "I think the priorities of Greek houses and their concerns are just focused elsewhere. It's more of a social thing and a recreational thing" (personal interview, May 6, 2011). Betts also recognizes this outlook of the Greek houses, in that there is a "more laid-back attitude or connotation associated with Greek houses [and there is] more focus on fun and chilling out so people aren't thinking about being sustainable" (personal interview, May 4, 2011). Suarez agrees, explaining that most people think of their time in a Greek house as "a time to relax and be carefree", so it is "the last place they want to be very responsible [and the] last time that they are going to think about turning off the lights in a room they're not using or reusing the same cup…" (personal interview, May 3, 2011). The Greek houses certainly are an important part of Dartmouth's social scene, and when students attend a party at a Greek house, they are there to enjoy themselves and unwind, and usually are not thinking about the things they 'should' be doing. If recycling and performing other eco-friendly acts is not automatic behavior for someone, he or she may not think of taking sustainable actions on a Friday or Saturday night inside the basement of a Greek house.

Similar to the fraternities, local sororities and co-ed Greek organizations hold parties, and the culture surrounding beer pong is inherently wasteful. "The Greek system could be a lot more sustainable in terms of how many cans of beer and cups are used. All of that can be recycled; everything in a basement can essentially be recycled. That's a lot of trash" (Member of the Tabard '12, personal interview, May 2, 2011). While the Greek scene's nature can be unsustainable, there are Greek houses that are trying to limit this waste. Chris Bilger '11, former Sustainability Chair of the Epsilon Kappa Theta local sorority, says that the members of her sorority reuse their cups when playing water pong, and states that it is "ridiculous" that many cups and cans are thrown into the trash cans instead of into the recycling bins (personal interview, May 1, 2011). Members at The Tabard also reuse their cups and even wash them out to prolong the lives of the cups; not only is this sustainable, but it saves the house money (Burstein, personal interview, May 5, 2011). If similar actions were taken by other Greek houses on campus, the Greek community could become much more sustainable, and beer pong would not have to be the antithesis of 'green.'

There are many other common themes throughout the interviews with sorority and co-ed members. For one thing, many of the House Managers and those members with positions such as Sustainability or Recycling Chair admit to feeling that they do not have much control over the operations of their own houses, particularly concerning water usage and heat. Hellerman says, "When I was House Manager, I really could only encourage people to follow whatever guidelines we established…I [could] just make recommendations…" (personal interview, May 8, 2011). Along similar lines, Bilger states that, when she was Sustainability Chair, she could mainly "give them [sisters] information and suggestions" regarding sustainability (personal interview, May 1, 2011). Because sorority houses are college-owned, it does make sense that these women in these house positions feel they have little power in changing house operations; in the dormitories, students usually cannot control the heat in their rooms or change their shower heads to water-efficient ones, and the same tends to apply to sorority houses. Evelyn Flint '07, one of The Tabard's Eco-Reps, says that one of her position's main responsibilities is to email sustainability tips to her Greek organization to give members ideas about how they can go green (personal interview, May 8, 2011); this is another form of encouragement, but does not directly change people's behavior. While these Greek members in these positions wish to educate their Greek sisters and brothers about sustainability, they do not have the control to make substantial changes in their houses regarding sustainability.

Another issue that arose in quite a few interviews was the subject of Dartmouth's "D-plan" quarter system. Almost a quarter of the students interviewed, from the fraternities as well as the sororities and co-eds, mentioned that the D-plan is a hindrance to making the Greek system, and Dartmouth in general, more sustainable. McGlinchey states: "One of our biggest issues is the D-plan and transitioning and continuity. We've got great campaigns and students with amazing drive with these wonderful ideas, and then they go away. We just keep starting over and over and over again, so no progress is made" (personal interview, May 3, 2011). Environmental programs usually are started by enthusiastic students, but when they leave for their off-terms, their efforts seem to disappear. There is a lack of stability in green movements because the leadership of those endeavors is not continuous. Flint mentions that The Tabard did not have an Eco-Rep last term, so she felt like she was starting from scratch: "With a position like Eco-Rep that theoretically is turning over every term since it's not a year-long exec position, every term you have a new person coming in having to learn the ropes before they [sic] get to the

point where they [sic] can move forward and add new initiatives" (personal interview, May 8, 2011). This issue also makes it difficult for green ideas to "gain momentum" since the students involved are moving on and off campus so frequently (Sonstegard, personal interview, May 4, 2011).

One other hindrance to greening the Greek system is the attitude of many Greeks towards sustainability. Lucas Sanford-Long '12, House Manager and Sustainability Chair of the co-ed organization Alpha Theta, speculates that, "Greek members [and other students on campus] might be ambivalent [towards sustainability]" and the problem is "some amount of laziness and not really knowing exactly what they need to do. It's a combination of the two" (personal interview, April 29, 2011); Bilger is in agreement with Sanford-Long's comments (personal interview, May 1, 2011). Some Greek members simply may not be interested in sustainability, while others might not take environmentally-friendly actions because they just do not know what they need to do or where they should start. Greek members as well as students at large have to know how to be sustainable before they can change their behavior, and perhaps making that information more approachable would help students live more greenly. There is also the issue of making recycling and other sustainable actions simpler for students. Hellerman mentions that the reason the basements of Greek houses may not be sustainable could be because being unsustainable is just easier. "It's probably cheaper to buy cans of Keystone than it is to get a keg. It's easier, it's more efficient time-wise; you can hand someone a can a lot faster than you can pump out a cup of beer. And so, for them [the Greek houses], it just seems easier, and it makes sense for the types of event that they're holding…The mentality is such that they care more about convenience than sustainability…There's still such a general sense of apathy" (Hellerman, personal interview, May 8, 2011). There seems to be an attitude that being wasteful and simply throwing everything away is easier than taking the time to be sustainable, and that could be generated from the indifference some Greeks have towards environmental issues. Attitudes clearly affect behavior, so before any steps are taken to green the Greek system, the students' outlook must be changed first.

But, if that mind-set could be changed for all Greeks, many interviewees believe that this sub-culture of Dartmouth could be a leader in greening the whole campus, especially since Dartmouth has such a high percentage of students involved in Greek organizations. Betts states that "the Greeks could be a role model for freshman and for underclassmen when they go

through rush, especially for people who are more interested in these issues…We're not just a social group; we want to do something while we're here" (personal interview, May 4, 2011). The Greek system could play a greater part in Dartmouth's culture as a whole than simply being the foundation for the College's social scene; Greek members would have the power to influence other students to be sustainable if the Greek system were greener. Burstein agrees, saying, "Frats and sororities are looked up to by [underclassmen]. If they experience sustainability in a Greek house, it's going to pass over…" (personal interview, May 5, 2011). There are those, though, who are not as optimistic. Raelee Conrad '12, a member of the Epsilon Kappa Theta local sorority, feels that "there's still a distinct divide [between underclassmen and Greek upperclassmen]," so the Greeks may not have much authority in affecting the behavior of other students (personal interview, May 2, 2008). And again, there is the issue of priorities. Sonstegard says she believes that the Greek system has the "potential" to be a leader for greening Dartmouth's campus, but that "house presidents are completely overwhelmed with their in-house responsibilities [and they feel that they] have to attend to immediate issues which are often regarding their own houses instead of expanding their view of their leadership" (personal interview, May 4, 2011). If houses are more interested in being individual leaders rather than coming together and leading as an entire community, then the Greek system may not be able to change how the campus at-large treats environmental concerns. But maybe the Greek houses would be interested in joining one another as long as the right frame of mind were there. Bilger says, "If you could get everyone really on board with [greening the Greek system], it would improve Dartmouth's sustainability considerably, and then we'd have that reputation even in the country. I think that would be a really great thing" (personal interview, May 1, 2011). President Jim Yong Kim wants to make Dartmouth the greenest campus in the United States ("Dartmouth Moves to Improve Recycling Rate," 2010), and perhaps the Greek system would be a good place to start.

IV.c. Recommendations for Greek Life

When we look at the Greek system as a whole, it is interesting to see the similarities and differences between the fraternities, sororities and co-eds, both attitudinally and culturally. During the interviews, there are many similarities between fraternities and sororities that can be addressed by the administration. 55% of the Greek students interviewed mentioned that Greek

houses would be more likely to recycle and perform other sustainable actions if there were rewards for those actions. Currently, there is no concrete incentive to recycle and be sustainable. Often the incentive is non-existent as in the case of sororities and fraternities that use the college's waste system. Also, the incentives to reduce waste by using the college's cheaper recycling pick-up program is often vague and requires a lot of number crunching and work on the part of an enthusiastic member of the house. It is yet another feat to try to sell the idea to his or her fellow sisters or brothers and have them participate. Furthermore, sustainability it is not a high priority on many students' agendas; almost 60% of student interviewees named priorities as a major hindrance to a sustainable movement both within the Greek system and campus at large. Piling another rule or difficult program on top of students who are unconcerned with sustainability often just entices frustration and anger.

Despite the similarities in a desire for incentives, a deep cultural divide does exist that will come to hamper any unified sustainability policy concerning the Greek system. In that sense, the administration must be aware of this and treat fraternities and sororities differently. Fraternities tend to have a more defeatist attitude when it comes to sustainability. This poses a problem when people try to incentivize sustainability through competitions, as most fraternities give up before they even start. On the other hand, a few sorority members praised the recycling and sustainability competitions of the past. The optimistic versus pessimistic attitude may stem from the fact that fraternities produce much more waste since they are open to campus and are responsible for community waste and not just personal waste, to which most sororities are generally limited. In particular to fraternities, where a majority of the community waste is produced, it seems as though programs enacted by the administration are often met with distrust, hesitation, and a lack of enthusiasm from the fraternities especially. This theme did not appear in any of the interviews with sorority members.

Therefore, if the administration was to truly create an effective sustainability policy for the Greek system, there will need to be a serious perspective shift when interacting with fraternities in particular. The members of the administration must accept the culture for what it is and realize that they will never know enough of the inner working and unique basement quirks of each individual house like the brothers do. Once they accept the constraints and cultural barriers of the system instead of trying to change them, the members of the administration can create an adaptable solution that works within the constraints of the system.

If change within a house must come from within, then the enthusiasm and passion of an individual member are often the catalyst of a program's creation within a Greek house. Therefore, the best course of action on the part of the administration is not to create new invasive initiatives or even try to solve the problem within the houses themselves (besides efficiency upgrades). Instead, the administration should strive to create a system that encourages the enthusiasm of that individual member and helps to take his or her project far with relative ease. Some recommendations from students include a sustainable keg policy which would remove cans from the basement and have the added benefit of slowing alcohol distribution (Devonshire, personal interview, May 2, 2011). By reducing the use of cans, a considerable amount of waste will be removed. If the system were designed so that an individual member could easily create a lasting sustainability or recycling program within his or her house, then we would see a large increase in Greek house sustainability. Perhaps then affiliated students would see recycling as easy and as the norm within their houses, and we may begin to see an unconscious social shift as brothers and sisters become more aware of the impact their Greek houses have on Dartmouth's sustainability as a whole.

V. Conclusion

This section has focused primarily on two core groups of students across the Dartmouth College campus; while we acknowledge that this study does not cover the entire diversity of the student body, it does include a wide variety of visible students who we believe are capable of enacting change on this campus. Through the athletics department, the utilization of the visibility of this community could be highly beneficial for a sustainable movement across campus as long as it is in line with the department's mission, which could potentially include sustainability. The Greek system on campus is another area highly capable of creating a change at Dartmouth if the administration supported individuals within Greek houses in their pursuits towards a more sustainable social culture.

In both areas, we face the problems of apathy and difficulty of changing current trends. What we have aimed to accomplish through this section is define students' current views towards sustainability and what it would take to create a change in those perspectives. Through the recommendations suggested above, we believe there are ways for the school to assist students in changing attitudes about sustainability and creating lasting programs.

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VI. Appendix

Dartmouth College Athletic Department Mission Statement:
http://www.dartmouthsports.com/ViewArticle.dbml?DB_OEM_ID=11600&ATCLID=584939

Dartmouth College and its Athletic Department are committed to providing an extraordinary variety of athletic opportunities that meet the talents, interests and needs of a broad range of individuals. The spectrum of programs and activities available for men and women includes "drop-in" recreation, physical education, intramural and club sports, and broad array of competitive intercollegiate athletic teams. At all times, the department strives to adhere to the basic tenets of the Ivy League as they relate to the representativeness of athletes, financial aid based on need rather than athletic ability, the limitation of sport seasons, and institutional autonomy in managing programs. The purpose of all Athletic Department activities is to foster and compliment the overall academic and intellectual growth of Dartmouth students and provide experiences that will enable them to interact in a special way with other students, test their own personal limits, and gain from the demands and realities of athletic competition and the success and adversity that go with it.

In attempting to work with students to create a safe, healthy, socially stimulating, educational residential community, our goals are to enable the students to be involved wherever possible in the governance and management of their teams and activities, and to make available, as appropriate, to all those who participate advice and information regarding the College's basic principles and expectations.

With respect to affirming and maintaining standards of conduct for responsible student behavior within the College community, our goals throughout the department are to encourage the highest level of deportment and performance not only in athletic endeavors but in all phases of campus life, particularly because many of our participants are very visible representatives of Dartmouth and, in many respects, important role models.

In attempting to do our part in sponsoring a rich variety of opportunities for students to grow intellectually, physically, socially, emotionally and morally, our goals are to make available high quality coaching, support services, scheduling, facilities and equipment; and to encourage excellence and meaningful interaction, no matter what the level of participation. Furthermore, we

aim to strive continually to make sure there is equity among the genders in all our programs and reasonable access to our facilities and our activities so that engaging in them is not overly complicated or difficult.

Regarding resources, in order to maintain overall support for our programs, and make sure that our participants are enriched individually and by one another during their recreational and athletic experiences, our goals are to structure a realistic budget and develop appropriate sources of revenue, and to foster effective communication between our coaches and the Admissions Office so that a diverse, talented pool of athletes is identified and favorably acted upon to enable us to achieve the greatest degree of success for our teams and our athletes, thereby bringing pride and positive recognition to the College, the community and Dartmouth graduates. As we work with our athletic prospects and our students encouraging them to exercise self-awareness and make well informed decisions that shape their college years and their subsequent lives, our goals are to have a thoughtful, thorough recruitment approach developed by our coaches and an on-going interaction with student-athletes on the part of the coaches, who so frequently act as mentors on matters beyond athletics, helping them to establish appropriate priorities, manage their time effectively and make difficult choices.

Finally, we feel it is our responsibility to foster, for employees and students alike, an environment that enables continuous learning, professional development, career preparation, the integration of personal and professional commitments, opportunities for advancement, and attainment of maximum performance. Constant attention to the full menu of goals and objectives described above is the only way they can be realized on an on-going basis and insure that the mission of the Athletic Department blends with the overall mission of the Office of the Dean of the College and the purposes of Dartmouth College.

Interview questions for Athletics
Disclaimer:
Before we start, I want to let you know that if you wish, we are more then willing to keep your results anonymous, however, including your name and title will add to the effectiveness of the information and ideas we gather today. We're not trying to judge how sustainable you or your program is, we just want to get some information and ideas to help guide the planning process. If at anytime, even in the future you decide you want to make your comments anonymous let us know, and we will do so.

Background:
The college, as part of its Sustainability Strategic Planning Process has engaged us, as members of ENVS 50, to help them gather information and develop their plan. We have been tasked with researching the Athletic Department, a large and extremely visible component of the college, in order to ascertain its current relationship to sustainability and also to explore directions in which that relationship might grow, both to target gains within the department and to serve as a model for improvements in other areas. While many folks have varying definitions of sustainability, the one most applicable to Dartmouth and this process is, **"Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."**

1. Tell me a little bit about how you see your role within the Athletic Department and the larger

Dartmouth Community: (Facilities; coaches); (what about their view of "problem areas")
2. What is the Mission of your community? How about values (community and personally)?
    -Is sustainability a part of that? Why or why not?
    -If Yes, what are you doing now for sustainability (Even if you think of it in different terms, such as waste reduction, or efficiency, concerning travel, water, energy, etc.)
3. Does your department have any specific plans to implement further sustainable practices?
If so please explain. Do you personally have any ideas that could be used to target sustainability?
4. What are some of the drawbacks, if any, of incorporating more sustainable practices?
- give examples if they can't think of any
- watering less could lead to fields drying out / harm turf quality
- cutting back on travel could reduce level of competition
- If so, how great would those impacts / drawbacks be?
5. If sustainability was your primary goal, above costs, win-loss records, or alumni input, how do you feel it could be implemented, how would you go about achieving that? (Imagine you have a "magic wand" and could make any changes you wanted.)
6. Do you feel the Athletics community / department could be a leader in 'greening' Dartmouth's campus?
7. Do you feel there is anything else you would like to relay to the committee?

Interview Questions for Greek organization members

1. Tell me about your Greek house operations. To what extent do you have control over operations? (i.e. heat, electricity, water use, insulation, recycling)
2. Is sustainability part of the mission of your community? Why or why not?
Does your Greek house interact with green groups or green initiatives on campus?
3. What do you think the Greek system is already doing to be green/sustainable?
4. What is the attitude of the Greeks relating to new initiatives concerning sustainability? Are there attitudinal barriers to greening the Greek system?
5. Why do you think green initiatives have failed in the past? KEY WORDS
6. BLANK school's Greek system is doing BLANK. Do you think something like that could be applied here at Dartmouth?
ex. Northwestern has a competition among dorms and the Greek houses concerning electricity and water use. Do you think a competition like that could be implemented here? Would it be successful? Why or why not?
ex. There is a group of students at the University of Chicago that go through the trashcans at Greek houses and separate out the recyclable items. Do you think any Dartmouth students would be willing to do this? Why or why not?
7. Do you think the Greek system could be a leader in 'greening' Dartmouth's campus?

Chapter III: Assessing Student Environmental Knowledge and Curricular Integration of Sustainability

Marshall Bartlett
Joseph Coleman
Thomas Flynn
Jenna Musco

I. Introduction

The Dartmouth College Sustainability Strategic Planning Process is tasked with laying out a high level road map towards sustainability leadership. A starting point for this project is assessment of the College's current "sustainability status". Outside of the Strategic Planning Process and the work of our group, Dartmouth has already undergone energy and resource use assessments, a student environmental attitude assessment, and a number of more formal assessments from outside organizations. These formal assessments and evaluations have aimed at grading the college's progress towards sustainability in relation to the progress at other colleges and universities nationwide. These assessments include the Sustainability Tracking Assessment and Rating System (STARS), the College Sustainability Report Card (Green Report Card), and an independent SCORE report conducted by a hired consultant. Before developing our own assessment method, we reviewed these evaluation tools and screened them for any metrics that specifically assessed the integration of sustainability teaching into college curriculums.

STARS is a transparent, self-reporting assessment framework for colleges and universities to gauge relative progress toward sustainability" (STARS). It was developed by the Association for the Advancement of Sustainability in Higher Education (AASHE), of which Dartmouth is a member. STARS attempts to evaluate sustainability initiatives in four broad categories: Education and Research; Operations; Planning, Administration and Engagement; and Innovation. The metrics that fall under the Education and Research category, in particular those under the curriculum sub-category (sustainability-related courses, sustainability learning outcomes, graduate programs in sustainability, sustainability immersive experiences, sustainability literacy assessments, and incentives for developing sustainability courses) extensively examine the degree to which sustainability is integrated into the college-wide curriculum. However, this assessment fails to sort these scores by department, which is particularly important for gauging student exposure. For example, while a college may receive a higher score for offering a number of "Sustainability-Focused Courses," if a few students choose majors that require these courses, only a low percentage of students may actually be exposed to these courses.

The Green Report Card specifically states that it does not include "teaching, research, or other academic aspects concerning sustainability" as part of its assessment (The College Sustainability Report Card, 2011). It evaluates schools on sustainability in the following

categories: administration, climate change and energy, food and recycling, green buildings, student involvement, transportation, endowment transparency, investment priority, and shareholders engagement (The College Sustainability Report Card, 2011). Perhaps the only possible indicators of sustainability teaching and student attitudes are the number of sustainability-themed residential communities, the integration of sustainability into new student orientation programs, the number of available internships/outreach opportunities in sustainability, the number of green student organizations, and the participation in sustainability challenges/competitions occurring on campus. None of these metrics examine the specific role of sustainability in department curricula. While these campus-wide, student-focused sustainability initiatives can be important for raising awareness and changing student attitudes, it has been found that these sorts of initiatives fail to result in large-scale, campus-wide behavioral changes (Owens and Halfacre-Hitchcock, 2006). For this reason, we felt it was particularly important to focus not on the Green Report Card metrics, but on concrete sustainability teaching via courses and curricula and the degree to which such teaching has an effect on students' specific sustainability or environmental knowledge.

A final formal assessment was conducted in December of 2009, when Dartmouth College hired outside consultant Maureen Hart from Sustainable Measures to conduct an extensive survey of the extent to which Dartmouth College has incorporated sustainability practices into its activities (Hart, 2009). In addition to using STARS assessment criteria, the report also made use of the Sustainability Competency & Opportunity Rating & Evaluation (SCORE). The evaluation focused on gauging sustainability in the following categories: facilities, purchasing, food and dining; green buildings; environmental affairs; transportation; information technology; senior management; human resources; marketing and public relations; and finance and accounting. In the conclusion, the report acknowledges "Dartmouth needs to instill a culture of sustainability into the policies, practices, and everyday activities of all members of its community" (Hart, 2009). Addressing this need must be one of the goals of the Learning and Culture Working Group of the Sustainability planning process.

Along with these formal sustainability assessments, past ENVS 50 Reports have also added to the body of literature with specific primary survey data of Dartmouth students. The 2010 ENVS 50 Report, for example, focused on attitudes towards sustainability and questions related to the Dartmouth Green Loan Fund. While their survey effectively reached a

representative group of the Dartmouth undergraduate student body, its questions primarily addressed student attitudes towards the potential implementation of sustainability initiatives at Dartmouth College and less on curricular integration of sustainability and student environmental knowledge. They did, however, demonstrate the relationship between the number of Environmental Studies courses taken and reported sustainability values (see **Appendix I**). We aim to build on these findings by surveying knowledge, rather than attitudes, in order to gain a more nuanced sense of the relationship between departments and sustainability.

Even with all these formal assessments and past ENVS 50 reports, no recent study has looked specifically at the environmental knowledge of Dartmouth students. Our student survey and evaluation of the integration of sustainability teaching into academic departments will fill this gap. Our results will give the Culture and Learning Working Group insight into the way environmental knowledge and sustainability teaching are distributed amongst the College departments. We hope that this insight will help the Working Group identify and support recommendations for curricular and cultural changes.

We believe that the Culture and Learning Working Group will benefit from an understanding of students' environmental knowledge, and that this metric will be a particularly useful way to measure change over time as sustainability initiatives are instituted. While the link between environmental knowledge and pro-sustainability behavior may not be well understood, there is undoubtedly some connection and an understanding of this knowledge as it relates to students' majors will help the working group make more informed recommendations. We hope that our finding will be useful as the Culture and Learning Working Group begins its "Gap Analysis."

Amongst many researchers who seek to understand why people take pro-environmental or pro-sustainability actions, an important consideration is the prerequisites for such actions. If we can understand the steps towards these actions, be they knowledge, attitude, or other factors, we can find effective ways to target these prerequisites and ultimately raise the awareness of environment and sustainability in our societies.

One popular model that seems logical but has received some criticism is the KAB model. This framework is based on the assumption that environmental knowledge (K) affects environmental attitude (A), which in turn affects environmental behavior (B) (Digby, 2010). This framework does seem to describe one way we progress to a certain behavior. However, to date,

the link between a person's knowledge about the environment and their pro-environmental attitudes or behaviors is not entirely clear (Digby, 2010). Some studies show a significant, but weak, positive relationship between environmental awareness and knowledge and environmental attitudes and behavior (Coyle, 2005). However, despite some evidence, there are some who reject this model because it assumes too linear a path from knowledge, to attitudes, to environmental behavior. These critics argue that while there may be correlation amongst knowledge, attitude and behavior, this correlation is weak and may, of course, not suggest causation at all (Coyle, 2005).

Overall, despite some critics, the evidence warrants cautious support of the KAB model, especially for certain applications. Based on a review of ten years worth of studies administered by the National Environmental Education and Training Foundation and Roper Research, Kevin Coyle argues that "a higher level of environmental knowledge correlates significantly with a higher degree of pro-environment behavior" (Coyle, 2005). This connection does have limitations. Most notably, it works best for simple knowledge and simple actions, such as consumer decisions about saving water. For such simple actions, there is significant correlation; people with basic environmental knowledge are 10% more likely to save energy at home and purchase environmentally safe products, as well as 50% more likely to recycle and avoid using chemicals in yard care (Coyle, 2005).

Despite the uncertainty about the correlation and causation between K, A, and B, this model seems to be useful, and a number of studies have sought to measure environmental knowledge and attitudes towards the environment. One way to measure environmental attitude is the New Ecological Paradigm (NEP). In a study at the University of Maine, Teisl et al. (2011) used the NEP as a metric to measure environmental attitudes before and after students had taken an environmental course. While they admit that there are many different instruments to measure environmental attitudes, they chose the NEP because it has been tested for validity and used frequently (Teisl et al., 2011). Their survey consisted of fifteen statements to which respondents indicate their agreement, including statements like "Humans were meant to rule over the rest of nature" (Teisl et al., 2011). Questions like this seem to assess religious ideology rather than just attitudes towards the environment. Some argue that the teaching of environmental attitudes, especially those concerning sustainability, can be prescriptive and overly ideological (Wals et al., 2002). In order to avoid this contested issue, we choose not to use the NEP, or any other similar

metrics for environmental attitudes. Instead, our focus will be on an assessment of environmental knowledge. It is probably impossible to describe all of the factors that determine whether or not people adopt pro-environmental or pro-sustainability actions. The KAB model is almost certainly inadequate for the task. However, there is some significant correlation between K and B, so environmental knowledge must play some part in determining actions and is therefore worth studying. Besides playing some part in determining the success of actions taken by the working group towards sustainability, environmental knowledge is also much easier to assess and measure over time than environmental attitudes.

There are a large number of studies designed to assess basic or general environmental knowledge (Digby, 2010). One such example is the Environmental Attitude and Knowledge Scale (EAKS) used by Benton (1994) to compare undergraduate business students to non-business students. While his results are interesting, the knowledge questions he selected were already 20 years old in 1994, so we looked elsewhere for a current environmental knowledge survey. Ultimately, we chose the survey designed and administered at Michigan State University as well as nationally by Michael Kaplowitz and Ralph Levine (2005).

II. Methodology

Administration of Environmental Knowledge Survey to Student Body

In order to assess Dartmouth students' environmental knowledge, we used the survey designed and administered by the National Environmental Education and Training Foundation (NEETF) and Roper Starch Worldwide (Roper). This set of questions "has become a generally accepted measure of levels of environmental knowledge in the United States" (Kaplowitz and Levine, 2005). Over a ten-year period ending in 2001, NEETF/Roper administered 12 environmental knowledge questions to a nationwide cross-section of 1500 adults (Coyle, 2005). Along with Kaplowitz and Levine, other studies have used these questions because they "have been found to be a valid and reliable measure of environmental knowledge" (Teskoz et al., 2011).

The NEETF/Roper survey consists of one question asking respondents to self-report their level of environmental knowledge, followed by 11 questions assessing their actual level of knowledge. Each question was designed to have one correct answer, one plausible but wrong choice, two implausible choices, and a "Don't know" choice (Kaplowitz and Levine, 2005). In

addition to these standardized questions, we designed four Dartmouth specific questions. We closely followed the format of the NEETF/Roper questions and sought to cover a wide range of issues related to sustainability at Dartmouth, including heating, waste, the administration of sustainability initiatives and sustainability policy. Like the NEETF/Roper questions, these questions should have been correctly answerable with basic knowledge of sustainability at Dartmouth. The complete list of the NEETF/Roper and Dartmouth specific questions may be found in **Appendices II and III**.

We administered this survey using SurveyMonkey, a popular online survey collection company. The survey consisted of three distinct pages, the first asking demographic information, including gender, class year, and affiliation with a fraternity, sorority, or with an athletic team. Each respondent was also asked to select his or her major from a list of the top ten most popular majors, plus an option for "other/undecided". Students with multiple majors were instructed to select more than one major. For more introductory information, respondents were asked, "Would you be interested in taking a class that addresses environmental sustainability if it were offered as a part of your major?" Each student could indicate that he or she had already taken such a class, or choose between answers of "yes," "maybe," or "no." The second page of the SurveyMonkey survey presented the 12 NEETF/Roper questions, and the last page presented the four Dartmouth specific questions.

The survey was distributed using Dartmouth's Blitzmail system. The campus e-mail lists were obtained from the 2011 Class Council account, and approximately 4100 undergraduates received the survey on April 24, 2011. Within a few days, we had received approximately 400 completed responses. After examining the breakdown of responses, we discovered fewer responses from members of the classes of 2012 and 2013, and decided to send the survey to these groups again on May 5, 2011. A total of 842 responses were collected over the course of eleven days before the survey was closed.

Ranking Curricular Integration of Sustainability in Academic Departments

In order to assess the integration of sustainability teaching into various academic departments, we decided to conduct a series of structured interviews with department heads. In keeping with the methods used for survey collection, we decided to focus on the top 10 academic departments by major for our assessment (see Dartmouth "Fact Book"). Rather than eliciting

surveys to staff members, we concluded it would be more appropriate to conduct structured interviews. Given time constraints for both faculty and our research group, we initially sought to interview only the Chairs from each academic department. In the event that we received no response from the Chair, we attempted to seek out any available department members or administrators who were willing to speak with us. Additionally, we asked each Chair if there were others in his or her department who would be better-suited to answer questions regarding the integration of sustainability education into certain academic disciplines.

The structured interview process consists of asking numerous individuals a set of questions with the same set of possible responses (ERIC/AE Digest). This method reduces the influence the interviewer may have on the interviewee's responses (control for interviewer effects) and also allows the interview to yield more quantitative rather than qualitative data (Melia, 2000; Whiting, 2008). In order to design our structured interview, we followed the steps listed below, which are outlined in "Designing Structured Interviews for Educational Research" from the ERIC/AE Digest:

1. Formulate broad overall questions that the survey is intended to answer
2. Translate these questions/Identify into measurable elements
3. Identify Target Population
4. Develop pool of questions designed to elicit desired information

(ERIC/AE Digest)

We designed the survey to illicit a better understanding of the correlation between popular student majors and the specific environmental knowledge of students revealed by our survey. In addition, the interview questions were designed to assess the degree to which different departments are open or able to incorporate sustainability teaching into their current curricula. Based on our initial examination of the 2010 ENVS 50 report, "From Rhetoric to Realization: Bridges to Sustainability at Dartmouth College," as well as conversations with Sustainability Office Director Rosi Kerr and Professor Anne Kapuscinski, a leading creator of the Sustainability Minor at Dartmouth College, we hypothesized that students majoring in departments with limited curricular components focused on sustainability will have less sustainability or environmental knowledge than students majoring in departments with more integrated sustainability teaching. Along with this correlation, we anticipated that students involved with departments with multiple classes that fall into the Sustainability Minor framework will have a better understanding of sustainability values and knowledge.

After laying out our broad goals and hypotheses, we formulated a final pool of questions aimed at achieving two concrete goals. First, several questions were designed to reveal quantifiable metrics regarding present integration of sustainability into department curricula. These include the number of students or professors engaged in research related to sustainability, the number of department faculty involved with the Dartmouth Sustainability Strategic Planning Process, and the number of courses currently focused on sustainability. Additionally, several of our questions were aimed at understanding the possible outlets for integration of sustainability education into curricula and gauging the receptiveness of departments to college wide sustainability initiatives. A complete list of questions is available in **Appendix IV**.

Information about departments that was acquired in our interviews was supplemented with course data collected by the Sustainability Minor Working Group, which we obtained from Professor Anne Kapuscinski. Last year, a working group was formed to develop a new Sustainability Minor at Dartmouth College. The working group evaluated curricula from a variety of departments, including Environmental Studies, Anthropology, Engineering, Studio Art, Native America Studies, Geography, and Earth Science. The working group developed a sustainability course track that focuses on 1) identifying and analyzing the forces that lead to unsustainable trends, and 2) the design of innovative approaches to achieving sustainability ("Undergraduate Sustainability Minor at Dartmouth College," 2010). The minor is led by the Environmental Studies Program. Our group reviewed this information and was particularly interested in the number of courses in each academic department that had already been reviewed and pre-approved by the Sustainability Minor Working Group as being applicable to the minor. While there may be additional classes that have been overlooked by the working group and which students may petition to have included in the minor, the data from the Sustainability Minor gives us a base-line statistic that can be used to quantify the degree to which sustainability teaching has been integrated into a particular department.

To quantify our interview data, we selected discrete information based on the faculty's responses. We created metrics to evaluate each department's data in four categories: 1) number of courses offered that count toward the sustainability minor, 2) number of undergraduates engaged in sustainability research, 3) number of faculty members engaged in sustainability related research, and 4) the opportunity and interest to integrate sustainability education in the future. Each individual metric was rated on a 0-2 scale, making the range for total scores 0-

8. For example, a department with a total score of 0 would have the lowest potential for or current integration of sustainability education into its academic curriculum, whereas 8 would indicate a high level of integration and opportunity for expansion. The complete description of the metrics can be found in **Appendix IV**.

III. Results

Student Environmental Knowledge Survey

Out of the target population of approximately 4100 undergraduate students, 842 took our environmental knowledge survey, giving us a response rate of 20.5%. Amongst those who started the survey, 718 (85.3%) completed the entire survey. For this study, both completed and partially completed surveys were scored.

We are extremely satisfied with the demographic characteristics of those who responded to the survey. While our student sample is not assumed to be representative of the general public, the sample is representative of the Dartmouth undergraduate student body. The class years of respondents closely reflects the equal populations in each of the class years, with 24.3%, 24.6%, 24.9%, and 25.7% of respondents being members of the classes of 2011-2014, respectively. As **Figures 1 and 2** illustrate, students majoring in our ten departments of focus, participated in the study proportionately. The only discrepancies are that slightly fewer English majors (6%) and slightly more Engineering majors (13%) participated than are represented in the student body (9% and 7%, respectively). Of the respondents, 63% were female and 37% were male, which also approximates the roughly 50% female, 50% male gender make up of the student body.

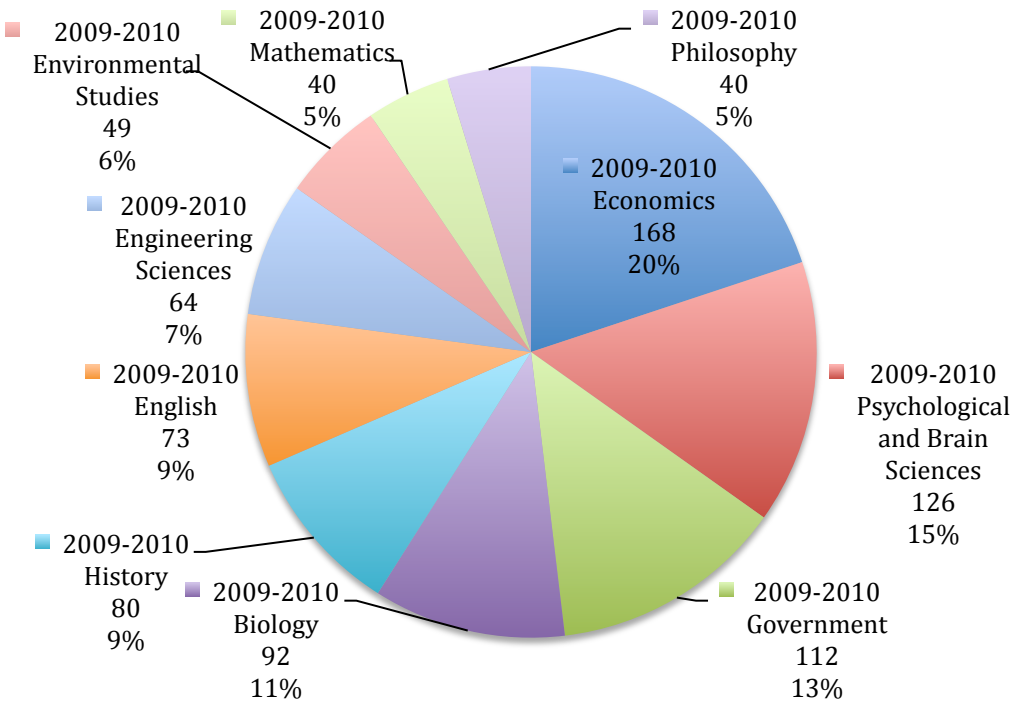


Figure 1. Relative distribution of most popular majors by department in the 2009-2010 academic year

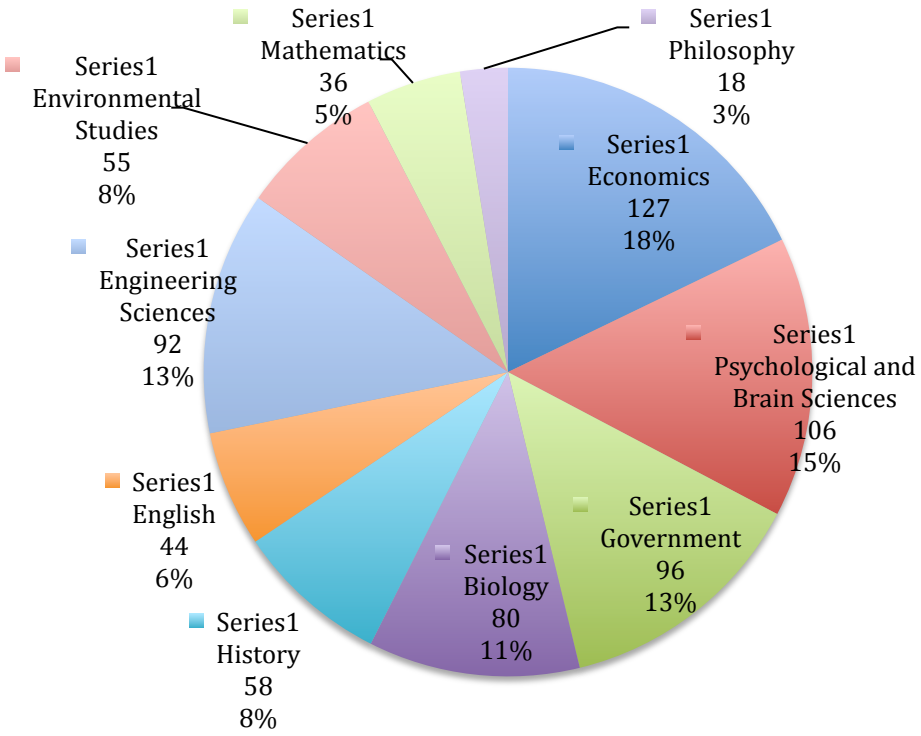


Figure 2. Relative distribution of majors of respondents to 2011 ENVS 50 Environmental Knowledge Survey

The last demographic-type question on the first page asked respondents whether or not they had already taken a class that incorporated sustainability, and would they take such a class if it were offered as a part of their major. Of the 836 people who answered this question, only 78 individuals (9.3%) reported that they had already taken such a class. The highest percentage of Dartmouth students, 39.7%, reported that they would be interested in taking a class on sustainability if it were offered as a part of their major.

The 12 NEETF/Roper survey questions, excluding the first question asking respondents to self evaluate their environmental knowledge, were scored as correct or incorrect. Some respondents skipped some questions, and it should be noted that questions were more frequently skipped towards the end of the survey. The most skipped question was number 11 (concerning species extinction), which was skipped by 16.6% of respondents. Amongst those that answered the questions, question 2 (biodiversity) was most often answered correctly, while question 5 (water pollution) was most often answered incorrectly. 97.7% of Dartmouth students knew the definition of biodiversity (Question 2), while only 49.3% of them knew that more pollution comes from surface water run off than factory waste (Question 5). Overall, the average score of those that answered the questions was 80.3% . This average knowledge score for Dartmouth students may be compared to scores of 74% at Michigan State University (MSU) and 58% for the nation (Kapowitz and Levine, 2005).

Most Dartmouth students either accurately assessed their own level of environmental knowledge or underestimated their knowledge. Despite the high average knowledge score, only 6.4% of respondents thought they knew “A lot” about environmental issues and problems, while the vast majority (86.6%) thought they knew “A fair amount” or “Only a little.” This self reported information may also be compared to the national and MSU data, where the general population over estimated their level of knowledge, while MSU college students were “fairly realistic” about their level of knowledge (Kaplowitz and Levine, 2005).

For the Dartmouth-specific environmental knowledge questions, students’ knowledge scores were noticeably worse. Of those that answered all four of these questions, only 47.4% of students answered every one correctly. The most correctly answered question was about the end point of Dartmouth’s trash, and the most incorrectly answered question was about the source of Dartmouth’s heating. Interestingly, 36% of Dartmouth students reported that they did not know that a pledge to reduce green house gas emissions was a part of Dartmouth’s sustainability

policy.

Following compilation and tallying of the survey results, statistical analyses were conducted on our data to determine the significance of the correlation between environmental knowledge and student majors, as well as several other factors. For the purposes of the following analyses, if an answer was skipped, it was treated as though the respondent had selected "Don't know," and was therefore counted as incorrect. If none of the knowledge questions were answered at all, the respondent was not included in the analysis.

An ANOVA statistical analysis of respondents' majors and answers to the 11 national survey question (**Appendix V, Figure 1**) revealed higher variation among majors than within them. After deleting respondents that skipped all the questions, the survey yielded 734 responses. With 12 degrees of freedom, the test yielded a p value of .003 and an F ratio of 3.0547. This means that a respondent's major *significantly* influenced his or her level of general environmental knowledge. Unsurprisingly, the test found significant variation in survey scores between Environmental Studies and Engineering majors versus Psychology and History majors. Environmental Studies majors have the highest mean of correct answers of 11, scoring 9.8 or 89%, while History majors have the lowest at 8.25 or 75%.

The same ANOVA test conducted on the 4 Dartmouth related question shows an even higher level of variation across majors (**Appendix V, Figure 2**). With the same 12 degrees of freedom, the p value is less than .0001 and the F ratio is 5.0. This indicates that the respondents of the various majors varied more in their answers to the 4 Dartmouth survey questions than they did on the questions on national environmental knowledge. It is important to note that this part of the survey contained only 4 questions, while the national survey included 11 questions, and this could account for some of the increased variation. However, such a low p value supports *significant* variation among majors despite the discrepancy in number of questions for these parts of the survey. The overall mean of correct answers of 4 is 1.89 or 47.25%. Again, Environmental Studies majors had the highest scores with a mean of 2.83 or 70.75%, while Psychology majors scored lowest at 1.4 or 35%.

Trends in Curricular Integration of Sustainability Across Academic Departments

Following interviews, each academic department reviewed was ranked on a scale of 0-2 for four metrics, allowing for an overall total score ranging from 0-8. 0 reflecting little to no curricular integration of sustainability in a department; 8 reflecting extensive potential for/already existing curricular integration. Findings from interviews were also supplemented with information from the "Undergraduate Sustainability Minor at Dartmouth College." **Table 1** (below) summarizes the scores of each department for each metric as well as total scores assigned to each department.

Department	Sustainability Minor Course Offerings	Undergraduate Sustainability Research	Faculty Sustainability Research	Opportunity to Incorporate Sustainability Teaching	Total Score (0-8)
Economics	0	1	1	1	3
Psychological and Brain Sciences	0	0	0	1	1
Government	0	0	0	1	1
Biology	2	2	1	2	7
History	0	0	0	0	0
English	0	0	0	0	0
Engineering Sciences	2	2	2	2	8
Environmental Studies	2	2	2	2	8
Mathematics	0	0	0	1	1
Philosophy	2	0	0	1	3

Table 1: Summary of scores by department, reflecting their current and future ability to incorporate sustainability education into their academic disciplines

The bar graph displayed in **Figure 3** (below) ranks the total scores received by each department. Engineering Sciences and Environmental Studies received the highest sustainability integration score (8), while History and English received the lowest scores (0).

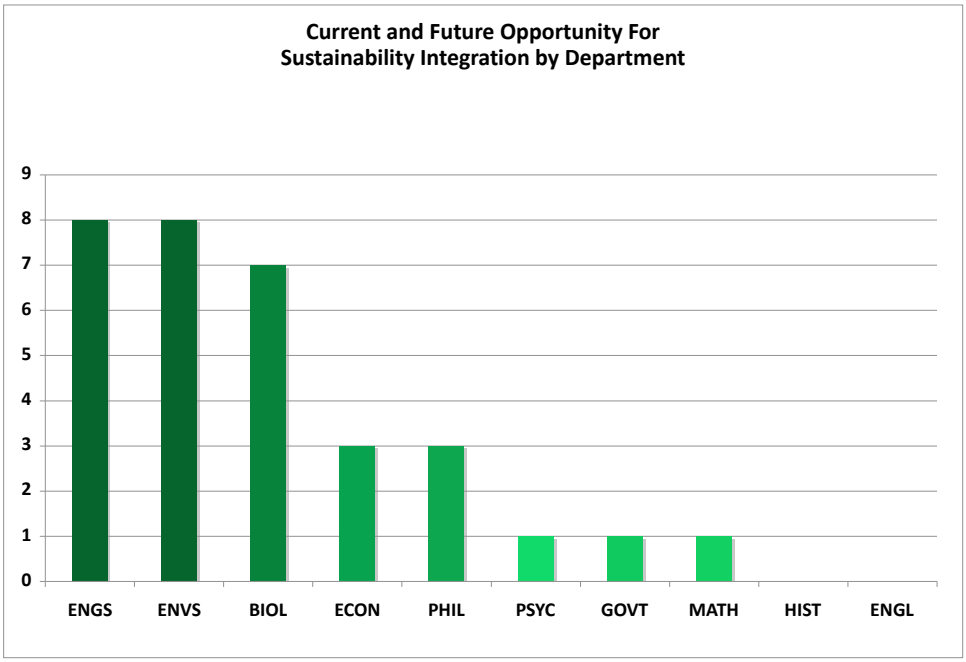


Figure 3. Total scores for current and future opportunity for the top ten most popular majors to implement sustainability education.

The results of the department review for curricular integration of sustainability provide insight into current and future opportunity to expand the role of sustainability concepts in the curriculums of the most popular departments (identified by # of declared majors). Analysis of these results is discussed below and they are used to make a number of important recommendations about sustainability in curriculum at Dartmouth College.

IV. Discussion

Student Environmental Knowledge Survey

We may draw a number of possible conclusions from the survey results. First, surprisingly, few people reported having already taken a class on sustainability, while the majority of respondents reported that they would be interested in taking such a class if it were offered as a part of their majors. This indicates that expanded curricular or distributive requirements that include sustainability teaching may be a change that students would support.

The success of this survey (and last year's ENVS 50 survey) at capturing a large, representative sample of Dartmouth students makes a strong case for the usefulness of such surveys offered by SurveyMonkey. However, looking at the number of respondents who skipped questions towards the end of the survey, it seems as though "survey fatigue" did play a part in

even this short survey. Survey fatigue is a phenomenon describing the tendency of respondents to skip more questions as any survey progresses, even when the survey is only about 20 questions long. As the Sustainability Planning process continues, we hope that the working groups remember the utility of such surveys, as long as the surveys are kept short and are not offered too often.

It bears mentioning that there is no direct connection between sustainability and environmental knowledge. As discussed, environmental knowledge is simply a likely precursor for pro-environmental or pro-sustainability behavior. Sustainability at Dartmouth will require sustainable behavior at a number of levels, from students to faculty to administrators, and the correlation and causation between this behavior and environmental knowledge is debatable. However, it is our contention that increased student environmental knowledge will give students the tools to make more informed decisions relating to the environment and sustainability. Presumably, more environmental knowledge will mean more successful sustainability initiatives.

We were pleasantly surprised with the level of general environmental knowledge amongst all respondents. A score of 80.3% compares very favorably to both scores from other colleges, and especially to scores from the national survey. For individual questions, there was a wide range of scores per question. The ANOVA tests support the conclusion that Dartmouth students' environmental knowledge significantly depends on their fields of study, especially concerning sustainability issues related to Dartmouth. The overall score for the Dartmouth questions, 47%, is alarmingly low. In fact, the raw data shows that of the 713 respondents who answered at least three of the 4 questions, 109 answered all 4 questions incorrectly. This means that 15.3% of those surveyed were unable to answer correctly any of our basic questions about sustainability at Dartmouth. The question answered correctly most often was only answered correctly 53% of the time. Also, only 42.8% of respondents know how our buildings are heated and only 50% know the name of the department that oversees our sustainability initiatives. Together, these low scores reflect a short-coming in the learning and culture of sustainability at Dartmouth.

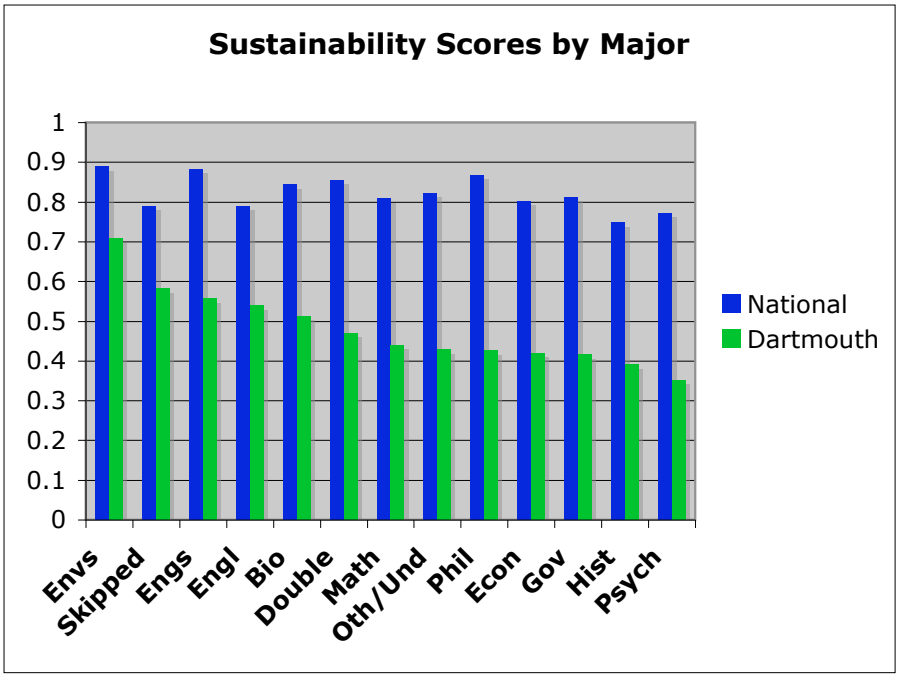


Figure 4: Percent of National and Dartmouth-specific questions answered correctly by major.

Figure 4 gives a visual picture of the variation presented in the ANOVA test discussed above. There is much less variation among Dartmouth students' scores on the national survey than among scores on the Dartmouth section (See Environmental Studies vs. History). It also appears that this knowledge is more concentrated in the Environmental Studies department.

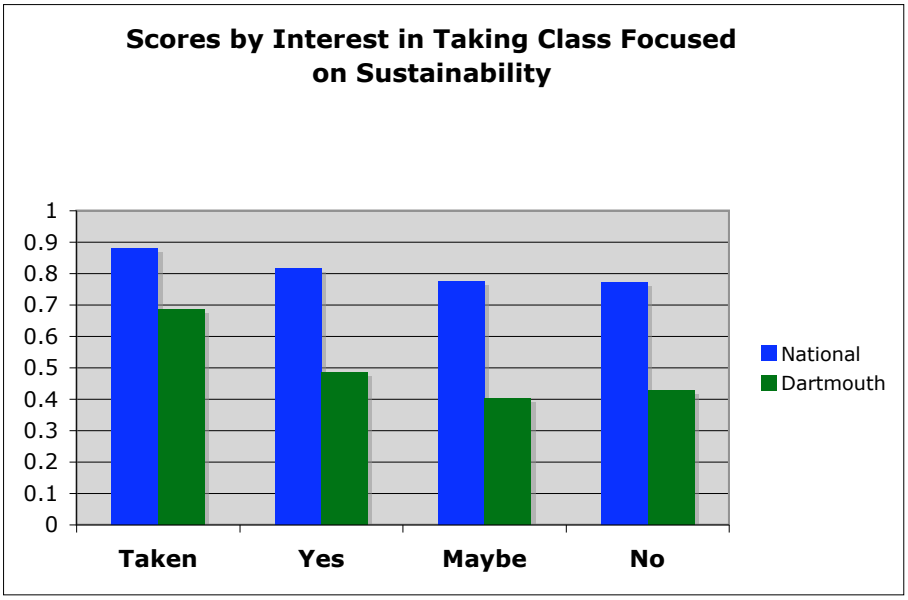


Figure 5: Percent of National and Dartmouth-specific questions answered correctly related to whether respondent had already taken or would like to take a sustainability-focused class offered for their major.

We conducted another ANOVA analysis comparing scores among answers to the following survey question: "Would you be interested in taking a class that addresses environmental sustainability if it were offered as a part of your major?" The test revealed a high level in variation, with those answering "Already Taken" scoring considerably higher on the National questions than those that answered "Yes" and "Maybe" or "No". **Figure 5** suggests that students who have taken a class focused on sustainability know considerably more environmental knowledge at both the national and local level. This is supported by our statistical analysis (**Appendix V, Figure 3**). One could argue that students who have taken a class about sustainability are more likely to have a past interest and therefore a greater background base of environmental knowledge, which accounts for their higher score. However, if we assume that all students that are interested in sustainability have a similar background level of environmental knowledge, then according to this argument, those who answered "yes" should have comparable score to those who answered "already taken." Figure 7, along with the ANOVA test, proves that this is not the case, and that students who have taken a class focused on sustainability score significantly higher than students who are merely interested in the topic.

The number of respondents who answered "already taken" versus those who answered "yes" to this question demonstrates student demand for more widespread integration of sustainability into Dartmouth's curriculum. Only 78 of 842 (9%) respondents answered "already taken," while 332 of 842 (39.2%) answered "yes;" 44% of those who responded "already taken" are Environmental Studies majors. Clearly the supply of sustainability-oriented classes across Dartmouth's most popular majors is not meeting the demand. Of respondents majoring in Psychology, 50% of respondents answered "yes", demonstrating interest in taking a sustainability-related course, while 0/106 psychology majors answered "already taken." These students also have the lowest average score on the Dartmouth environmental knowledge section of the survey. This implies that mere interest in sustainability does not translate into knowledge and that where there is student interest in sustainability, the college is not meeting the demand in the curriculum.

Figure 6 (below) shows a near linear increase in interest in sustainability with each new class at Dartmouth. The numbers on the top of the bars represent the number of respondents from each class. The negligible differences in these numbers supports the accuracy of the data. The Dartmouth curriculum has not responded to this salient increase in interest.

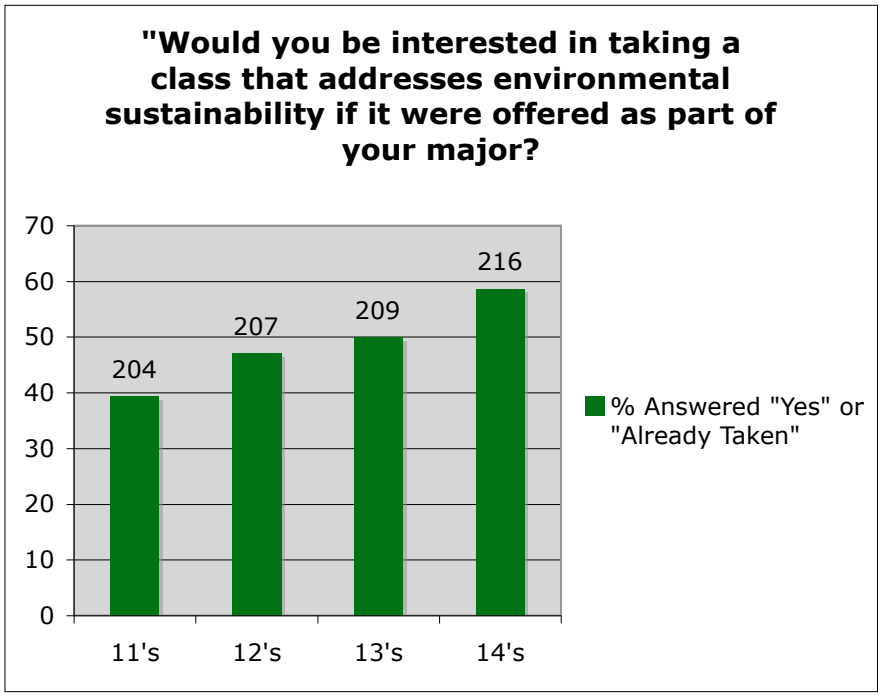


Figure 6

The survey question addressing Greek and athletic affiliation allows us to compare differences in environmental knowledge among members of these popular student sub-communities (See Chapter 2). Our ANOVA tests revealed no statistical difference in knowledge among the 4 categories of respondents: athletes, members of Greek organizations, members of both athletic and Greek organizations, and those who reported neither athletic nor Greek affiliation (**Appendix V, Figures 4 and 5**). We surmise that the diversity of both athletic and Greek organizations, and the high level of student participation in both explain the varied levels of knowledge across the groups of respondents. To further explore this topic, we would need to alter our survey to break down the Greek and Athletic organizations into smaller groups, allowing respondents to claim specific affiliation with Fraternities, Sororities, Co-Educational Greeks, male varsity sport, female varsity sport, club sport, etc.

Overall, analysis reveals that students know markedly less about issues related to sustainability at Dartmouth than they do about national environmental issues. While the Dartmouth questions do not have an extensive history of use and editing, they are very close in format and were also vetted by a number of students and faculty. Assuming these questions were not misleading in any way, it is astonishing that only 12.2% of students answered every question correctly. Notably, the most missed question was about Dartmouth's pledge to reduce green

house gas emissions; this pledge represents a major achievement towards improved sustainability by the college that many students are unaware of.

Curricular Integration of Sustainability in Academic Departments

Based on the scores generated for each department using our Faculty Survey Metrics, we can conclude that Environmental Studies and Engineering already expose the majority of their declared majors to sustainability concepts, and show the most potential for integration of sustainability into their curricula. Each of these departments received a score of 8. As the Environmental Studies department chair Professor Andrew Friedland notes, "sustainability is an integral part of a liberal arts education" (personal interview, May 6 2011). Both Environmental Studies and Engineering departments teach about sustainability issues directly in a number of courses. Within the ENVS department, these issues include global population, concepts of carrying capacity and atmospheric carbon concentrations. Within the Engineering department, these issues include green engineering, management of natural resources, closing energy and waste loops, and building infrastructure. Additionally, these departments already have faculty engaged in sustainability research that are available to teach courses that address sustainability and advise students interested in exploring sustainability research within the department. The addition of additional curricular material related to sustainability could easily occur and integration already does occur within each department's introductory courses to which most majors are exposed: ENGS 21: "Introduction to Engineering" and ENVS 3: "Environment and Society: Towards Sustainability."

Following Environmental Studies and Engineering, the Biology Department also demonstrates significant potential for the curricular integration of sustainability concepts and received a score of 7. Within the Biology Department, Ecology, the study of ecosystems, is the primary research focus of a number of faculty members and students, and this field is naturally linked with issues of sustainability. However, unlike courses in Environmental Studies and Engineering, these linkages to sustainability are not necessarily highlighted or discussed directly in every Ecology course. Only one professor within the department explicitly teaches about sustainability issues. Biology 11, the introductory course that is required for all majors, is offered in various sections. While some sections do integrate sustainability, there is significant curricular variation amongst the many sections offered. For both Biology 11 and Ecology courses, a more

consistent focus of sustainability would be a great opportunity to insure that all majors, not just those in certain sections, are exposed to key concepts of sustainability. Overall, Environmental Studies, Engineering, and Biology majors scored highest on the Dartmouth specific questions of our environmental knowledge survey.

The Economics, Philosophy, Government, Psychology, and Math departments received curriculum integration scores ranging from 1-3, indicating limited integration of sustainability into these fields of study. For these departments, there is either a peripheral, indirect link between sustainability and the department's discipline that limits integration, or limited resources preventing sustainability from becoming a more featured component of their curricula. Within the Government Department, sustainability is a component of the environmental law course but is not necessarily highlighted. Similarly, according to Professor Erin Mansur, the Economics Department engages with sustainability indirectly through courses on environmental and public economics and their discussions of externalities. Within the field of Psychology, interest in sustainability falls under the study of Social Psychology, which examines how people relate to structure and the environment and how we use scarce resources. Unfortunately, the Psychology Department does not a have any faculty focused on research in this area and the concept is only briefly touched on in a survey course of Social Psychology. Similarly, the issue of resource limitations is a concern in the Government Department where Professor John Huber, who has specialized in teaching environmental law, is leaving the department, and there is no plan to replace him with another environmental law specialist.

Both the History and English Departments received a score of 0, indicating lack of cohesion between sustainability and the departments as well as limited opportunities for curricular integration of sustainability. The English Department Chair, Gretchen Gerzina, pointed out that the department is focused on literary study and that the integration of sustainability into this particular curriculum would not be beneficial for students. Similarly, the History Department is divided into various foci depending on time period and region of study. The department reported that it would be difficult to integrate the concepts of sustainability into such a wide variety of curricula.

A preliminary Strengths, Weaknesses, Opportunities, and Threats (SWOT) Analysis of our above discussion is an efficient way of summarizing our overall findings:

- *Strengths:* Integration of sustainability into the curricula of departments where it is clearly compatible would allow exposure of increasingly important sustainability concepts to a growing percentage of students. Expanding student knowledge and understanding of sustainability would improve the Dartmouth liberal arts education in several ways. First, understanding sustainability allows students to improve their interdisciplinary and multi faceted approach to solving real-world problems. Sustainability concepts equip you with the knowledge and practical skills needed to understand diverse perspectives on sustainability and to work collaboratively with peers and experts from different fields. Many of the environmental problems we face today, and their relation to current social, political, and economic systems are presumed to stem form unsustainable practices in which the current global population fails to consider the long term impacts of their actions on both the environment and future populations.
- *Weaknesses:* Curriculum structure, discipline focus, and limited faculty may make it impossible to integrate sustainability teaching into popular departments. Psychology, for example, has the second highest number of declared majors who demonstrated a clear interest in taking a sustainability related course in our survey, but lack of a faculty member focused on research in Social Psychology may prevent these students from being exposed to sustainability concepts in their Psychology courses. Additionally, the integration of sustainability teaching into department curricula would detract from other subjects addressed in department curriculums. Students may also be overwhelmed by new sustainability concepts and thus hesitant to take upper-level courses addressing the subject.
- *Opportunities:* Our interviews revealed a number of opportunities for integration of sustainability teaching into current department curricula without major restructuring or expenditure of resources. Integration could increase by adding or enhancing the sustainability component of various introductory courses in departments with the most major enrollment, such as Biology, Engineering, and Environmental Studies (**Table 1**). Additionally, given demonstrated student interest in sustainability and faculty perception of its benefits, a number of interdisciplinary courses on sustainability could also be offered.
- *Threats:* Resistance to change and failure to view various disciplines from an interdisciplinary perspective could cause some departments to exclude linkages to sustainability from a definition of their discipline. Generating faculty enthusiasm about

sustainability is an important tool for encouraging the integration of sustainability into the courses faculty members teach. In our interviews, it was clear that some departments maintain a more traditional understanding of how their disciplines integrated within a student's broader education. These departments were less open to including sustainability in their disciplines and were hesitant to acknowledge the benefits of doing so. Additionally, faculty members may prioritize space in their curriculums for teaching other interdisciplinary topics such as global health, public policy, or ethics.

Admittedly, our process for evaluating academic departments contains a fairly wide margin of error. First. the term "sustainability" itself has various meanings. This confusion was echoed during our interviews with faculty members when we opened our conversation with: "How would you define sustainability in the context of your academic discipline?" Professor Erin Mansur from the Economics Department referenced Robert Solow's technical definition of sustainability, whereas Professor Andrew Friedland, from the Environmental Studies department, discussed how a basic education in sustainability would include specific topics such as the global population, carrying capacity, and atmospheric carbon concentrations. From yet another perspective, Professor Jay Hull, Chair of the Psychology department, discussed the limited cognitive ability to prioritize long-term well-being over immediate reward. Despite the term's controversy and the various components of its definitions, it seems that most academic departments emphasize sustainability in the context of humans' interacting with the environment in a way that is not detrimental or limiting to future generations. While this broad consensus definition is valuable, it must be kept in mind that there are many conceptualizations of sustainability.

A second source of error is our limited sample size of department representatives. For most departments, 7 out of 10, we were able to speak with the Department Chair, who is supposed to represent the entire department. Nonetheless, there are inherently personal biases in responding to structured interview questions. Additionally, personal biases of interviewers can play an influential role in that cues from the interviewer about the acceptability of responses being presented can alter interviewee responses (Melia, 2000). There was also concern with information asymmetry, in which the Department Chair does not always have enough information to answer all of the questions. In some cases, we were able to consult others in the

department, but a more complete review would require thorough conversations with the entire department faculty, particularly about their individual research interests.

Our analysis of the top ten most popular major departments also fails to capture a comprehensive view of a Dartmouth education in its entirety. Driven by Dartmouth's diverse set of distributive requirements, most students take the majority of their classes outside their major departments; of 35 required credits, only 10 are needed for most majors. Furthermore, the number of students who declare multiple majors or minors has grown significantly over the past few years (Dartmouth "Fact Book"), potentially suggesting that students are increasing their exposure to departments outside their majors that may incorporate sustainability education.

After analyzing the metrics used for evaluating current and future sustainability integration by department (**Table 1**), it is clear that our fourth indicator, "Potential opportunity to implement sustainability education within department in the future," contained some interpretive bias. This was the only indicator that did not rely on objective data. However, the two interviewers discussed each response and are confident that the answers are relatively consistent. We concluded that departments would receive a score of 2, or "definitely," if the respondent specifically answered in the affirmative and gave examples of how sustainability concepts could be/already were incorporated into existing courses. Respondents who thought that these concepts could be incorporated, but lacked the faculty to support its integration received a score of 1, or "possibly." Again Professor Huber's departure from the government department is an example of this loss of expertise. Lastly, respondents who did not feel that these concepts could be integrated at all received a score of 0, or "no." **Figure 7** separates out this forth metric from the total scores given to each department.

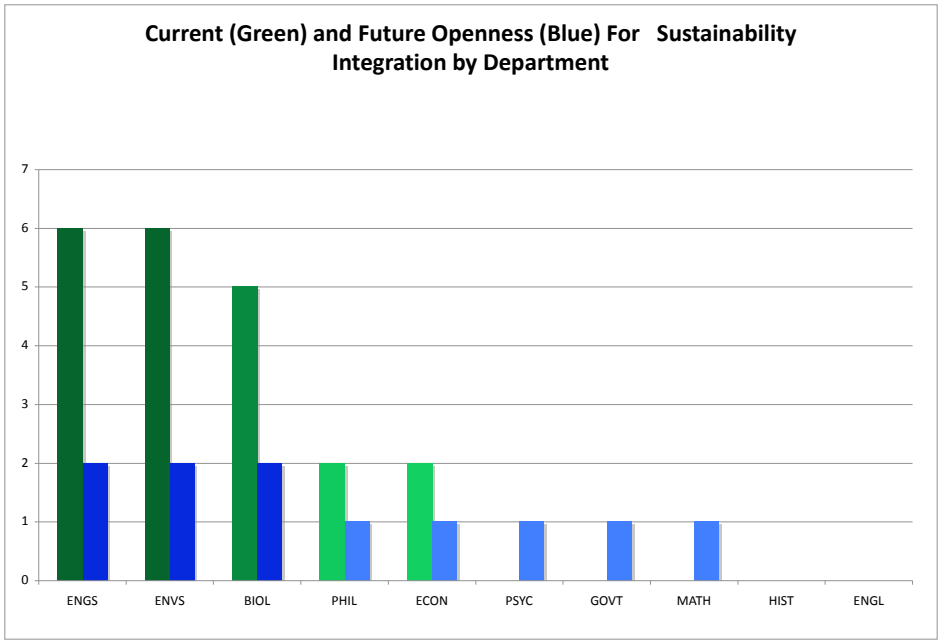


Figure 7

Finally, some of our indicators shift annually. For example, the Economics Department currently has only one undergraduate working on sustainability research. However, Professor Mansur plans to take advantage of more undergraduate research opportunities (eg. Presidential Scholar Program) next year. Similarly, faculty changes would alter our results. For these reasons, it will be important to continue this analysis at least annually.

V. Conclusion

After analysis and discussion of our results, our group has developed several recommendations for the Culture and Learning Working Group. We hope these recommendations will lead to increased student body environmental knowledge and continued assessment of the student body's understanding of sustainability. In particular, we have identified several areas of further research that would be beneficial for continued assessment and understanding of sustainability at Dartmouth College.

Recommendations

1. Re-evaluation of current distributive requirements and development of a 'sustainability' distributive requirement.

Our group believes that integrating sustainability into the current distributive requirement

structure would be valuable for continued understanding of sustainability by Dartmouth students. Currently, according to a survey done by the National Wildlife Federation's Campus Ecology Program, only 8% of higher education institutions have an environmental literacy undergraduate requirement (Rowe, 2002). If Dartmouth were to institute a distributive requirement for sustainability or environmental literacy, it would certainly make the College one of the leaders in the sustainability field. Development of such a requirement would both promote the creation of new interdisciplinary courses that discuss sustainability concepts and insure that all Dartmouth students are exposed to the important lessons surrounding sustainability. According to Professor John Carey, the chair of the Government Department, his department is open to the discussions about incorporating a sustainability requirement for undergraduates, albeit with some hesitations. He stresses that "the deliberative process is important in discussion of distributive requirements for students, but the requirements will likely be reviewed in the near future" (personal interview, May 6 2011). The recommendation of a sustainability distributive requirement is supported by further research done by Rowe (1999). Rowe (1999) found that students who took an interdisciplinary course with a focus on creating a more humane and environmentally sustainable future increased their concern for the future of society, increased their belief that their actions can make a difference, and increased their willingness to help solve societal and environmental problems.

2. Incorporate at least one lecture about the integration of sustainability and the department's discipline into the introductory course for each major.

As discussed by Professor Cushman-Roisin from the Engineering Department, this strategy allows sustainability teaching to touch the maximum number of students (personal interview, May 10 2011). The study of sustainability is interdisciplinary, and students would benefit from greater understanding of how sustainability links their studies to a number of issues concerning the environment and society. While integration of a sustainability lecture would mandate the need to reduce emphasis on other introductory material, the long run benefits of using sustainability thinking to problem solve complex interdisciplinary problems should outweigh this cost.

3. Annual or bi-annual administration of both the structured interviews and student environmental knowledge survey.

This periodic assessment would provide the Culture and Learning Working Group with steady feedback about how well Dartmouth College is doing to integrate sustainability concepts into students' attitudes and everyday learning experiences. Additionally, our group found that just the administration of our interview questions encourages department heads to think more critically about their departments' curricula and how sustainability teaching could be further incorporated. Similarly, just the administration of the survey led students to think about basic environmental knowledge, and many of them contacted us to receive the answers to the knowledge questions.

Areas for further research

1. A more in-depth curricular review of department courses to better identify any components related to sustainability.

As noted in the above discussion, our inability to interview more than one professor in each department made thorough understanding of the extent to which curricular integration of sustainability was occurring difficult. Extension of the work done by the Sustainability Minor Working Group, such as reviewing course syllabi, talking to individual professors, and reviewing course descriptions would be beneficial for developing a more complete picture of sustainability learning at Dartmouth College.

Together, the results of the knowledge survey and the faculty interviews make the case that the integration of sustainability into the curriculum at Dartmouth must be improved. We found that a student's level of environmental knowledge depends significantly on his or her major. Moreover, a student's knowledge of issues related to sustainability at Dartmouth depends even more significantly on his or her major. This data, together with the findings of the faculty interviews, which demonstrates a significant need and opportunity to incorporate more sustainability teaching into certain popular departments, suggests that sustainability teaching and increasing environmental knowledge must be a priority of the Sustainability Planning process and the Culture and Learning Working Group in particular.

Appendix I: ENVS 50, 2010 Findings

Figure 1

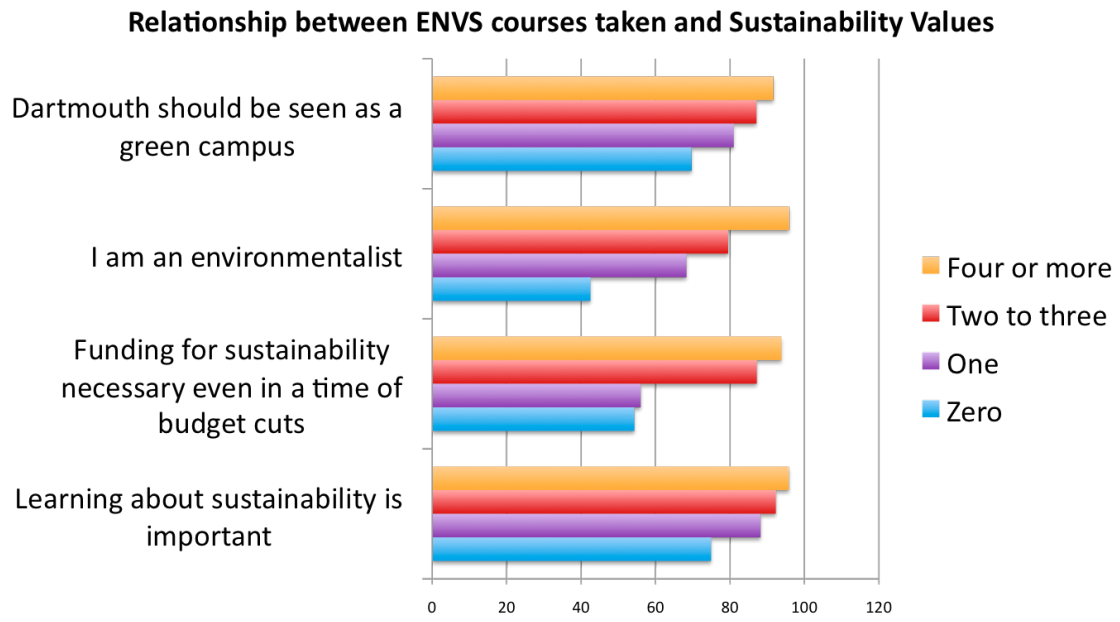


Figure 1: The number of Environmental studies courses taken by respondents related to reported sustainability values, as indicated by agreement with the listed statements. Source: ENVS 50 Report, 2010

Appendix II: National Environmental Knowledge Survey

NEETF\Roper National Survey Questions, correct answers in bold.
From: Kaplowitz and Levine (2005) "Environmental Knowledge at a Big Ten university"

H) PLEASE ANSWER THE NEXT 12 QUESTIONS. IF YOU DON'T KNOW THE ANSWER, PLEASE MARK 'DON'T KNOW.'
(Mark one response for each statement.)

H1) In general, how much do you feel you know about environmental issues and problems?
1 ☐ A lot
2 ☐ A fair amount
3 ☐ Only a little
4 ☐ Practically nothing
5 ☐ Don't Know

H2) There are many different kinds of animals and plants, and they live in many different types of environments. What is the word used to describe this idea?
1 ☐ Multiplicity
2 ☐ Biodiversity
3 ☐ Socio-economics
4 ☐ Evolution
5 ☐ Don't Know

H3) Carbon monoxide is a major contributor to air pollution in the U.S. Which of the following is the biggest source of carbon monoxide?
1 ☐ Factories and businesses
2 ☐ People breathing
3 ☐ Motor vehicles
4 ☐ Trees
5 ☐ Don't Know

H4) How is most electricity in the U.S. generated?
1 ☐ By burning oil, coal, and wood
2 ☐ With nuclear power
3 ☐ Through solar energy
4 ☐ By hydro electric power plants
5 ☐ Don't Know

H5) What is the most common cause of pollution of streams, rivers, and oceans?
1 ☐ Dumping of garbage by cities
2 ☐ Surface water running off yards, city streets, paved lots and farm fields
3 ☐ Trash washed into the ocean from beaches
4 ☐ Waste dumped by factories
5 ☐ Don't Know

H6) Which of the following is a renewable resource?
1 ☐ Oil
2 ☐ Iron Ore
3 ☐ Trees
4 ☐ Coal
5 ☐ Don't Know

H7) Ozone forms a protective layer in the earth's upper atmosphere. What does ozone protect us from?
1 ☐ Acid rain
2 ☐ Global warming
3 ☐ Sudden changes in temperature
4 ☐ Harmful, cancer-causing sunlight
5 ☐ Don't Know

H8) Where does most garbage in the U.S. end up?
1 ☐ Oceans
2 ☐ Incinerators
3 ☐ Recycling centers
4 ☐ Landfills
5 ☐ Don't Know

H9) What is the name of the primary federal agency that works to protect the environment?
1 ☐ Environmental Protection Agency (the EPA)
2 ☐ Department of Health, Environment, and Safety (the DHES)
3 ☐ National Environmental Agency (the NEA)
4 ☐ Federal Pollution Control Agency (the FPCA)
5 ☐ Don't Know

H10) Which of the following household wastes is considered hazardous waste?
1 ☐ Plastic Packaging
2 ☐ Glass
3 ☐ Batteries
4 ☐ Spoiled Food
5 ☐ Don't Know

H11) What is the most common reason that an animal species becomes extinct?
1 ☐ Pesticides are killing them
2 ☐ Their habitats are being destroyed by humans
3 ☐ There is too much hunting
4 ☐ There are climate changes that affect them
5 ☐ Don't Know

H12) Scientists have not determined the best solution for disposing of nuclear-waste. In the U.S. what do we do with it now?
1 ☐ Use it as nuclear fuel
2 ☐ Sell it to other countries
3 ☐ Dump it in landfills
4 ☐ Store and monitor the waste
5 ☐ Don't Know

Appendix III: Answer Key for Dartmouth Specific Environmental Knowledge Questions

Correct answers in bold.

How are most of Dartmouth's buildings heated?

- Geothermal facilities
- Using natural gas
- **By burning fuel oil**
- Through solar energy
- Don't Know

Where does most Dartmouth's garbage end up?

- Recycling centers
- Incinerators
- **Landfills**
- Oceans
- Don't know

What is the name of the primary College department that oversees sustainability initiatives for facilities and operations at Dartmouth?

- **Office of Sustainability**
- Environmental Conservation Organization (ECO)
- Sustainable Dartmouth
- Environmental Studies Program
- Don't Know

Which of the following is part of Dartmouth's sustainability policy?

- Sustainability is mentioned in the Mission Statement
- **A pledge to reduce green house gas emissions**
- A plan to offer all organic food by 2050
- Don't know

Appendix IV: Materials for assessment of curricular integration of sustainability in academic departments

Structured Interview Questions

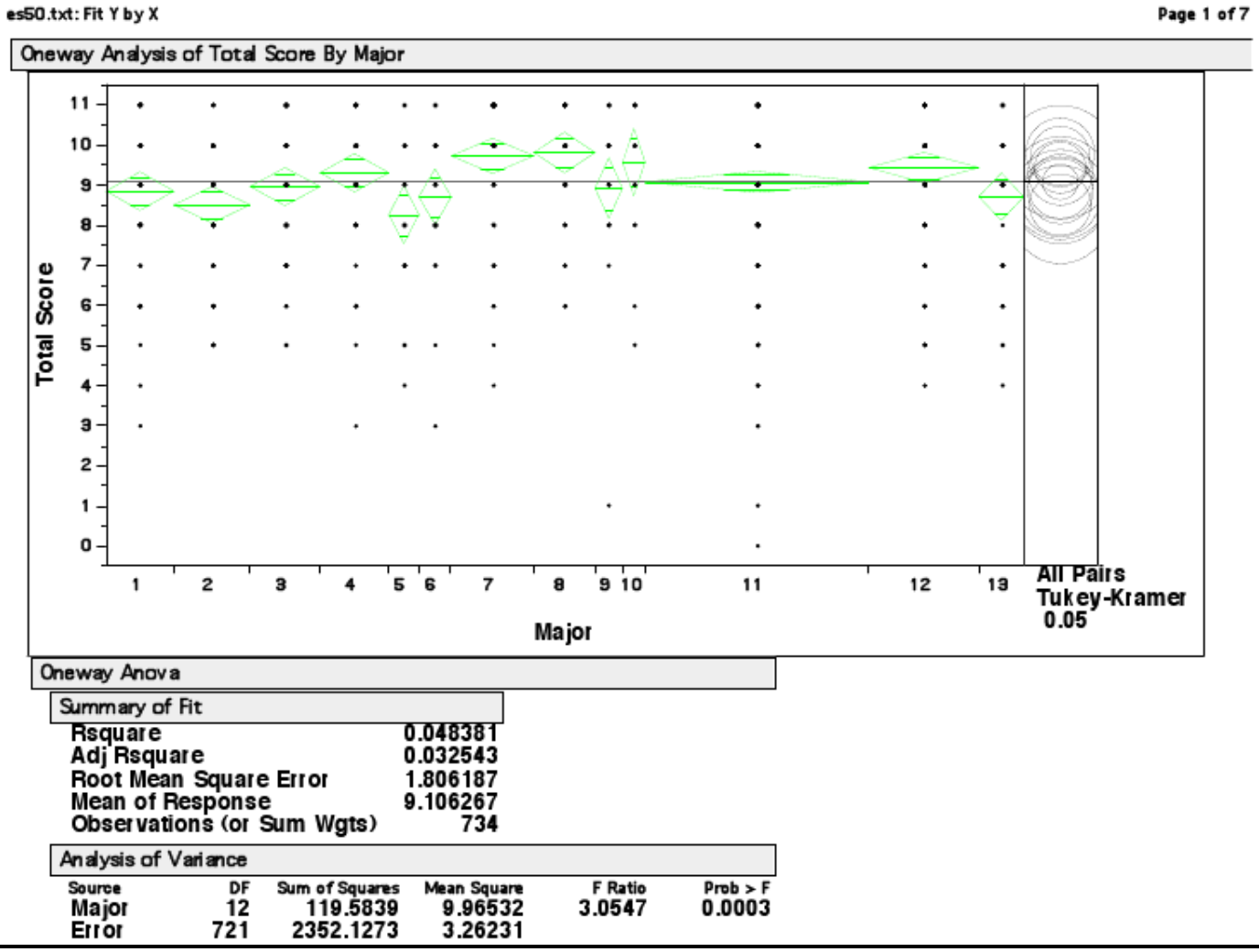
1. How would you define sustainability in the context of your academic discipline?
2. How could your department integrate sustainability education into your department's current curriculum?
3. Do you think students/the College as a whole would benefit from having sustainability teaching integrated into the curriculum of your major department?
4. Are there any professors in your department that are/have been engaged in research related to sustainability issues? Other environmental issues?
5. Are there any students pursuing research/theses/independent projects related to sustainability/other environmental issues in your department? Are there other ways in which students in your department express their interest in sustainability?
6. Are any members of your department involved in the college's new Sustainability Planning Initiative (part of working group/on steering committee or sounding board)?
7. We've heard that many departments have struggled with the new "bin and bucket" system transition. How do you think the Office of Sustainability could better support your department?
8. Do you think there is anyone else in our department who would be interested in talking with us about our project?

Sustainability Integration Metrics

1. Number of classes in department offered towards Sustainability Minor (0 = 0, 1 = 1, 2 = multiple)
2. Number of students engaged in sustainability or environmental research (0 = 0, 1 = 1-3, 2 = >3).
3. Number of faculty engaged in sustainability or environmental research (0 = 0, 1 = 1, 2 = multiple).
4. Potential opportunity to implement sustainability education within department in the future (0 = none, 1 = possibly, 2 = definitely).

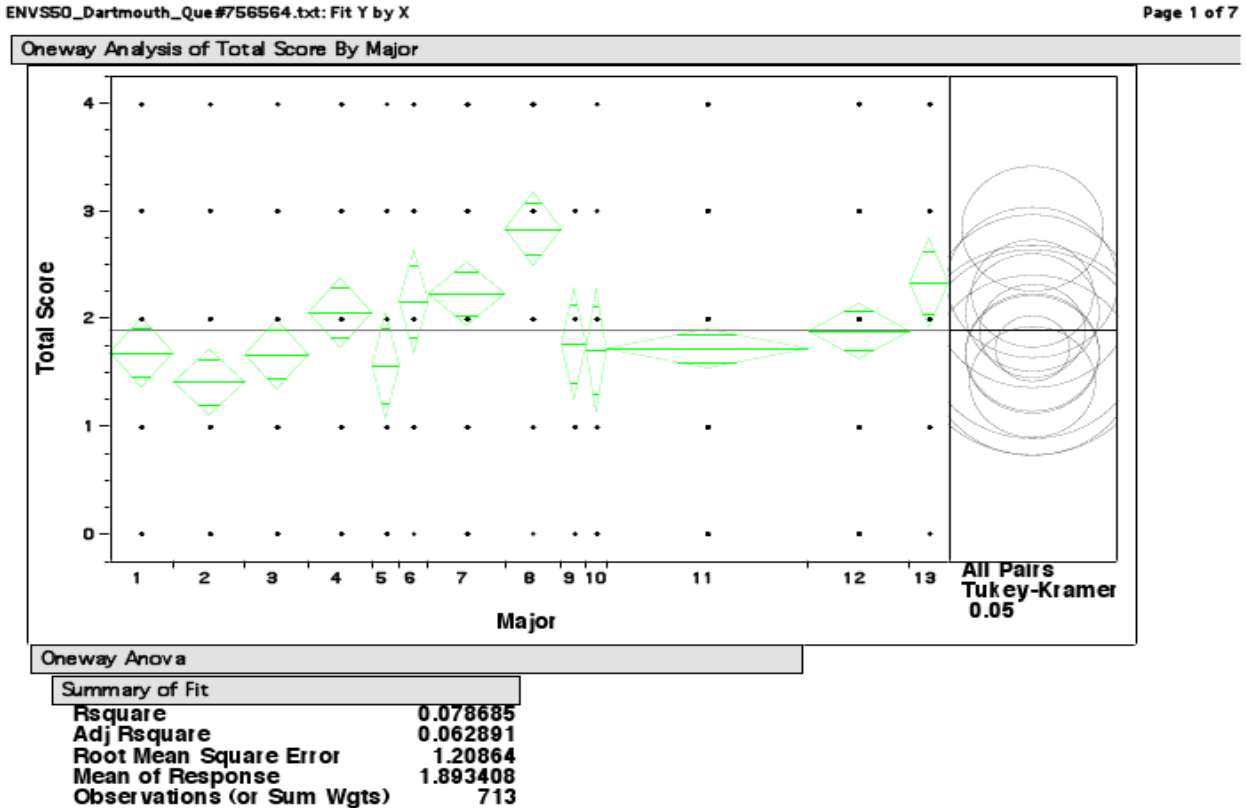
Appendix V: ANOVA Statistical Analysis of Environmental Knowledge Survey Results

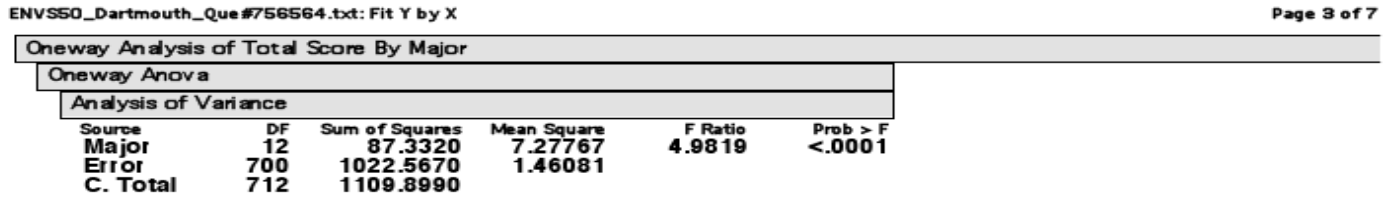
Figure 1. Variation in Scores on National Environmental Knowledge Questions Among Majors



*Key for Majors: 1=Economics, 2= Psychological and Brain Sciences, 3= Government, 4= Biology, 5= History, 6= English, 7= Engineering, 8= Environmental Studies, 9= Mathematics, 10= Philosophy, 11= Undecided/ Other, 12= Double Majors, 13= Skipped Question

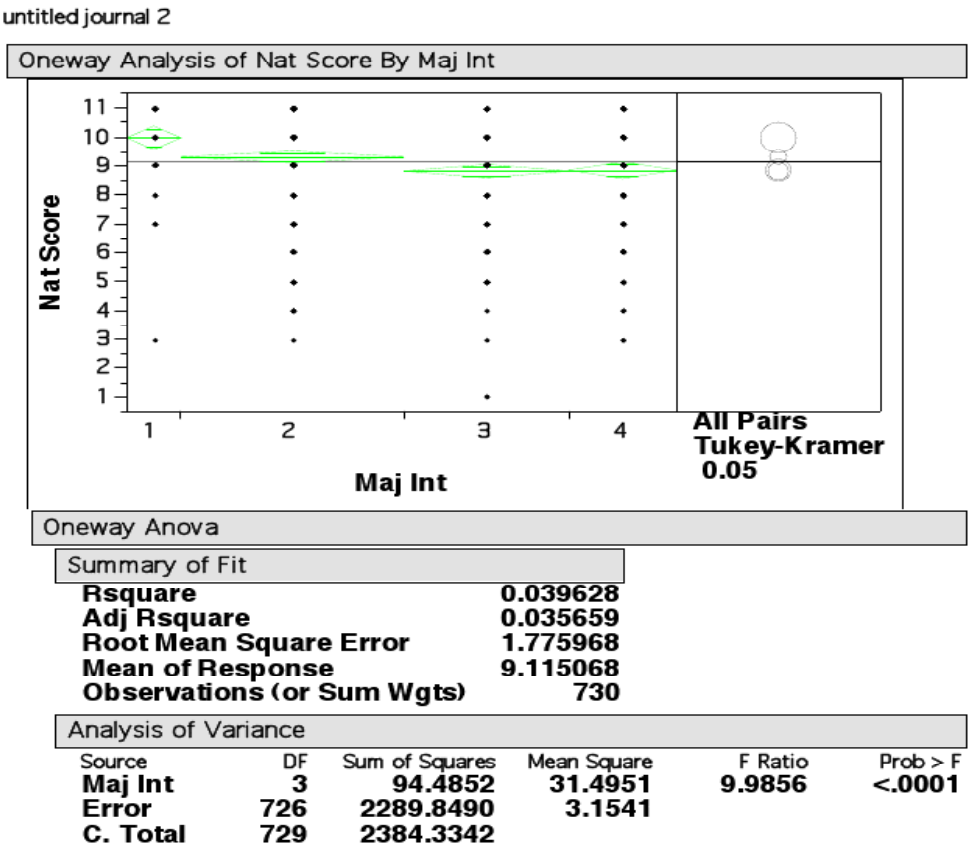
Figure 2- Variation in Scores on Dartmouth-Specific Questions Among Majors





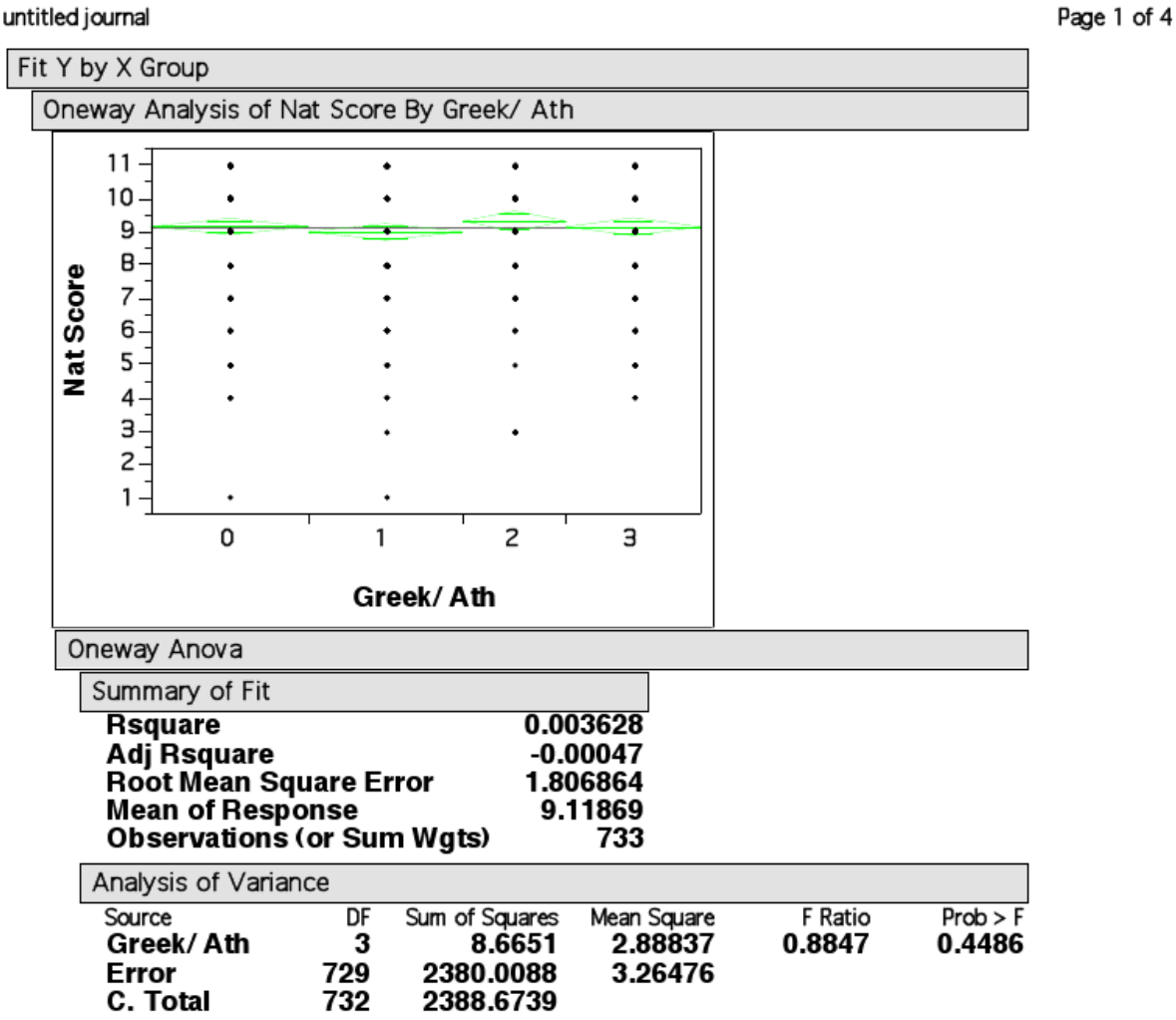
*Majors same as Figure 1

Figure 3- Variation in Scores on National Questions Among Interest Levels in Taking a Sustainability Focused Class



*Answer Key: 1= Already Taken, 2= Yes, 3=Maybe, 4= No:

Figure 4. Variation in National Scores Based on Greek and Athletic Affiliation

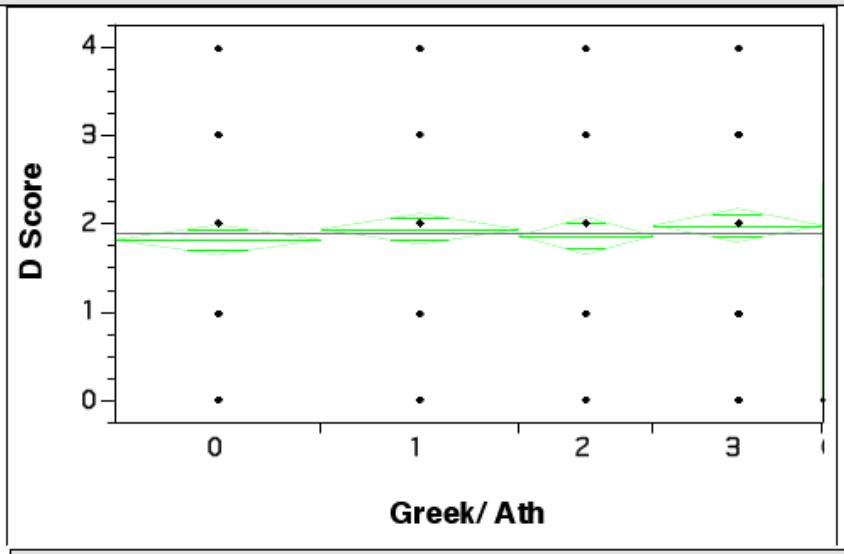


*Key: 0= Neither Greek nor Athlete, 1= Greek, 2= Athlete, 3= Greek and Athlete

Figure 5: Variation in Dartmouth Scores based on Greek and Athletic affiliation.

Fit Y by X Group

Oneway Analysis of D Score By Greek/ Ath



Oneway Anova

Summary of Fit

Rsquare	0.005945
Adj Rsquare	0.000328
Root Mean Square Error	1.249898
Mean of Response	1.892006
Observations (or Sum Wgts)	713

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Greek/ Ath	4	6.6144	1.65359	1.0585	0.3761
Error	708	1106.0701	1.56225		
C. Total	712	1112.6844			

*Key same as Figure 4

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Chapter IV: Improving Student Group Communication

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Travis Price
Zach Schwartz
Virginia Selden

INTRODUCTION:

Although numerous student groups self-identify as being primarily concerned with sustainability issues ("green groups"), previous efforts to institutionalize sustainability at Dartmouth have fallen short due to inadequate student and administrative commitment, a lack of outreach, and ineffective communication among student sustainability groups. This chapter will focus on the third impediment to the successful implementation of sustainability programs on campus: communication within and between campus groups.

In order to develop a model for effective communication at Dartmouth, we will examine both effective and ineffective methods of communication within and between a variety of campus groups. In this chapter, we will attempt to address the following questions:

1. How do student groups at Dartmouth successfully communicate within their organizations?
2. What sort of communication system would enable green groups at Dartmouth to more effectively collaborate?

The goal of this project is to provide the Sustainability Planning Steering Committee with an effective system for implementing and maintaining green initiatives at Dartmouth. Through an examination and analysis of existing forms of communication methods at Dartmouth College, a viable model for sustainability group communication is developed.

Although the focus of this report is undoubtedly on sustainability and green groups, we chose to examine additional sectors of Dartmouth student culture in order to gain a better understanding of overall student and department communication methods. We interviewed student members and administrators at the Tucker Foundation, the Athletic Department, and the Collis Student Center, in addition to those involved with green groups, so that we might obtain information about four diverse umbrella organizations. Throughout the interview process, we attempted to determine how the members of these aforementioned groups communicate with each other. In order to provide a realistic and thorough model for the Learning/Culture working group, we examined not only the successes of these umbrella groups but also the shortcomings in communication identified by their members. As Dartmouth's commitment to sustainability continues to develop and evolve, it will be essential to keep both the shortcomings and positive attributes of campus communication in mind during the implementation of the Steering Committee's proposed sustainability initiatives.

As we conducted interviews and collected information about group communication at Dartmouth, we also researched the academic discourse surrounding group organization, collaboration, and communication on college campuses in general. We approached these topics through the lens of sustainability and found a number of studies that detailed various barriers to the implementation of environmental management schemes or sustainability initiatives at colleges and universities (Herremans and Allwright, 2000; Vasquez et al., 2005; Viebahn, 2002).

One of the most common shortcomings of the successful implementation of sustainability programs is ineffective communication within organizations at a hierarchical level. For example, Schild (2010) cites fragmented communication as a pitfall of the institutionalization of sustainability initiatives at Colorado College. She notes an issue at Colorado College that is also common at Dartmouth and thus especially relevant to our research: "The manner in which the campus communicates internally can be ineffective. The daily listserv is visually unappealing and can be easily glazed over without the reader ingesting all of the information" (2010, p. 53). Although information about sustainability programs is "communicated" at Dartmouth through Blitzmail, students, faculty, and staff are not necessarily reading or absorbing the provided information and applying it to their respective Dartmouth communities. Schild also notes data visualization as a more effective way to communicate information (2010, p. 67). We will similarly develop a visual representation of both effective and ineffective communications at Dartmouth in order to provide student sustainability groups with a potential model for organizational communication.

Overall, there are many barriers to the implementation of sustainable practices in colleges and universities. The classification and analysis of these barriers found in our research will serve as a guide for our interview findings, which we will ultimately present to the Learning/Culture Working Group. Of the numerous impediments to the implementation of environmental education and sustainability initiatives on college campuses included by Vasquez et al. (2005), the identified categories of "organizational structure," "lack of communication and information," and "designated workplace" are particularly relevant to our group's research.

Although we encountered extensive academic literature concerning barriers to successful implementation of sustainability initiatives in higher education institutions, we noted a lack of literature focusing on effective means of communication among campus sustainability groups. We will subsequently acknowledge and avoid these barriers as we develop an original roadmap

to effective group communication and successful program implementation at Dartmouth. Although we can all agree that being the "greenest campus in America" would be desirable, that concept doesn't constitute a sustainable vision that we, as students and members of the surrounding community, can act on. As we move forward, it would be helpful to categorize some of the common problems cited by interviewees and to research those individual issues in the environmental management literature.

METHODS:

Personal interviews were conducted to provide a qualitative analysis of how communication flows both internally and externally within a number of Dartmouth College organizations. Campus groups were divided into three prominent umbrella groups: student life groups (centered in Collis), the Athletic Department, and service and spirituality groups (in Tucker). Within each group, at least ten individuals from relevant sub-groups or departments were interviewed. Throughout the interview process, communication methods were explored both within the groups and between these groups and other campus organizations. Existing green groups were also interviewed in order to get baseline data of how communication currently flows within these groups and to identify how communication methods might vary among different umbrella groups.

The nature of this project dictated that the survey questions be qualitatively oriented. We felt that examining the experiences of organizations through individual interviews would be more enlightening than a generic quantitative survey based on traditional communication methods. Surveyors asked group representatives about the nature of communication within the group and with other groups, and also asked about effectiveness of current methods and the potential for improvement. (For a full list of questions, see Appendix B.)

The data from the surveyors was collated into two main categories: assets to existing communication and obstacles to existing communication. An analysis of data identified the groups that currently communicate in an effective and efficient manner. Methods utilized by these successful model groups were adapted to propose a system of communication that can be implemented by Dartmouth sustainability groups. In order to provide a visual representation of effective versus ineffective communication, we mapped out an organizational hierarchy for two model groups, namely the Dartmouth Outing Club and the Pan-Asian Council. We also created a

visual image of the ineffective communication of green groups (See Figures A, B, and C). From these visuals, conclusions were developed on how to improve green group communication so as to make it structured like the model groups.

FINDINGS:

OBSTACLES

Interviews revealed significant trends across each of the four umbrella groups. Several common factors were cited as major obstacles to communication. We have divided these factors into five broad categories: Issues with Blitzmail; Student Culture; Administration and Administrative Structure; Coordination; and Media other than Blitzmail. The identification and analysis of these factors provides valuable information in our proposal for an effective communication structure.

Blitzmail

Issues with Blitzmail	**47**
Unresponsiveness	*10*
Miscommunication	*5*
Time Delay	*8*
Limited Design Capabilities	*3*
Overuse	*13*
Other	*8*

Blitzmail (or Blitz) is a unique and characteristic element of Dartmouth culture. Because members of the Dartmouth community use the email program as a primary form of communication, it was no surprise that issues surrounding blitz surfaced in almost all of our interviews. The prevailing sentiment suggested that blitz comes with drawbacks and frustrations, but is very much ingrained in the Dartmouth culture of communication. Dartmouth's reliance on Blitz for communication, especially in planning events, is a characteristic distinct to the college, according to Kate Petcosky, Tucker's Volunteer Coordinator. At other universities where Kate Petcosky has worked, New York University and Boston University, she noted that in-person meetings were more common and that email was used infrequently. However, students and administrators from all four umbrella groups showed dissatisfaction with Blitzmail in several ways. Because Blitz is used as a component of nearly every manner of exchange across campus, students are inundated with emails each day, a factor pointed to as a way of explaining the general lack of responsiveness. Sy Mukherjee, former Vice President of the College Democrats, explained that blitzes must be concise and relatively infrequent or else people tend to merely gloss over them. Greg Goldstein,

Student Director for DREAM, admits that not everyone reads every blitz, and not everyone who reads the blitzes responds when they should. Shadara MacNicol, Assistant Athletic Director for Facilities Scheduling and Event Planning, also stresses the potential for miscommunication "born out of quick reads and quick responses."

Another concern voiced by many of those interviewed, from the green groups in particular, is the lack of Blitz lists that include all interested students. Freshmen tend to be particularly critical of Blitz because they have neither the comprehensive lists nor the access to blitz accounts that upperclassmen have gained in their time at Dartmouth. Freshman Sarah Alexander organized the Power Shift 2011 youth environmental conference in Washington, D.C., this past winter, but she described how frustrating it was for her to try and get the movement organized at Dartmouth using Blitz. Once she found her way to Sustainable Dartmouth's Tuesday meetings, she asked the Head Intern at Dartmouth Office of Sustainability, Sarah Frostenson, to blitz out from the well-established Sustainable Dartmouth account. However, the process was inefficient and "exhausting." Nick Devonshire, a member of the Big Green Bus (BGB) and several other environmental groups, noted that Blitz worked well as a means of communication within the BGB, but only because the group was so small. He said that use of Blitz in larger environmental groups makes people "filter it out," meaning that uninvolved recipients of mass Sustainable Dartmouth blitzes are not likely to read information distributed within these groups blitzes or even to open the email. Jenna Musco and George Thorman, both members of the Organic Farm, agreed that Blitz works well when it is used within the group as a follow-up to the Farm's structured Tuesday meetings. Thus, there is a delicate balance between leaving no interested person out, and at the same time using restraint and not bombarding too many people with too much information. Many of those interviewed enumerated other problems with Blitz. Some lamented the limited design capabilities, including its inability to contain graphics, special text, and other frills common to most email carriers today, and its lack of a feature comparable to AOL's Instant Messenger (Shin Kyu Park). Hannah Kim, treasurer of the Korean Student Association, also mentioned that Blitz does not offer a comfortable venue that allows people to open up about personal issues.

Student Culture

Student Culture	45
Apathy/Shallow Involvement	*9*
Over-commitment to Multiple Groups	*7*
Lack of Continuity (D-Plan)	*7*
Student Turnover	*3*
Fractured/Insular Student Groups	*15*
Unclear Leadership	*1*
Other	*1*

Certain inherent elements of student culture at Dartmouth pose obstacles to efficient and effective communication within and amongst groups. Although many of these elements are a large part of what makes Dartmouth unique, they often also inhibit the flow of information throughout campus. All colleges have a large turnover each year, as one-fourth of the student body graduate while a new group of students replaces those departing. More so than at other colleges, however, Dartmouth experiences a higher level of student turnover in group membership and leadership as a result of its unique D-plan. Each term sees students come and go according to their D-plan. As a result, Kurt Nelson, Tucker's Assistant Chaplain, says, there is a constant community-building effort that needs to take place. According to Kurt Nelson, long-term stable relationships are the goal between different groups on campus, but too often student leaders are not aware of or in touch with one another. This problem is exacerbated by the frequent changes that take place in the leadership of a group. Members of several green groups noted that the D-Plan results in a significant lack of continuity over long periods of time. Cristina Pellegrini, a member of Ecovores and former Head of House of the Sustainable Living Center, mentions that the methods of communication change from term to term as the active members of the group change. Kelly McGlinchey, an intern at the Office of Sustainability, talks about how it is difficult to achieve a "mentality of sustainability that pervades [campus]," because people come in every term with great ideas and then leave before they can really get their footing. Staff can serve an important role in this regard because they are often fixtures while student leaders come and go, and can thus work toward continual progress by reminding groups of past actions and future goals.

Another student culture issue that surfaced was the tendency for students to be extremely busy and overcommitted. Varsity track and field captain Christina Supino notes how lack of commitment, due to either disinterest or over-involvement in other organizations, can impede effective communication. Cristina Pellegrini says that when someone steps up to take a leadership role in a group, they get burnt out quickly because they are often also involved in so

many other things on campus. She believes that it is this lack of effort and energy – not an ineffective communication system – that prevents groups from functioning efficiently. Not only are there many different activities and events continuously happening on campus, but also there are many students trying to initiate new student organizations that have very similar interests to existing groups. Maya Granit, Co-President of the Inter-Community Council (ICC), mentioned a recent group of students who contacted the ICC looking to start a group. The ICC members denied the students' request because there were already three existing groups on campus that had similar goals.

George Thorman and Jenna Musco raise a different commitment issue, explaining the prominent divide that exists between students who are very committed to the Organic Farm and those who are just there to "hang out." Eric Ramsey, director of the Collis Center for Student Involvement, explained that the make-up of campus is much more non-traditional than in the past. International students, veterans, transfer students, and other factions make it more difficult to create an effective message that will reach everyone.

Administration

Administration and Administrative Structure	**19**
Lack of Funding	*4*
Lack of Administrative Support	*8*
Other	*7*

Though a somewhat nebulous concept for many groups, the administration and administrative structure at Dartmouth drew criticism from interviewees for posing a barrier to communication amongst groups.

Dean of Tucker, Rickard Crocker, alludes to one of the biggest administrative obstacles on campus: too much concern with autonomy. Different groups want to maintain funding and independence, but the result is a lack of communication. As multiple student life groups noted, there are multiple groups with similar goals and if these groups were better able to coordinate, they could likely receive more money. Within green groups, funding comes from a multitude of different sources: Sustainable Dartmouth receives its funding from the Office of the Provost, the Ecovores receive theirs from COSO (Council on Student Organizations), the DOC and Organic Farm use the DOC's endowment, and the Big Green Bus uses private outside sources. Temporary groups like Power Shift obtain funding from various sources such as the SPEC (Special Programs and Event Committee). This fractured organization inhibits the free flow of

information ideas amongst similar groups and stratifies groups even more. Sarah Frostenson believes that centralizing funding will be a huge step in increasing communication. It is interesting to note that the various sub-groups of the DOC report efficient communication and all groups obtain funding from the same source. Generally, however, when it does exist between similar groups, communication is on a case-by-case basis. For instance Student Director of Big Brother Big Sister, James Kim states: "Our goal isn't to collaborate. Our goal is unique to us."

Additionally, there is a general lack of administrative organization. Recently, the office of the Dean of the College has been in upheaval, due to a rapid turnover of deans in the past few years. This office used to hold monthly meetings to bring together disparate parts of campus. Helen Damon-Moore, Tucker's Director of Service and Education Programs, looks forward to the renewal of these meetings. Meanwhile, there is also some uncertainty regarding the avenues of communication with the new administration of President Jim Yong Kim. An anonymous source notes it is difficult to contact people in the higher administrative offices. One student interviewed mentioned that there is not an administration or faculty listserv to supplement the new student body listserv. Within the green groups, Annie Laurie Mauhs-Pugh, member of the Ecovores and the Organic Farm, Joe Pearl, Education Leader at the Organic Farm, and Cristina Pellegrini all feel that the administration does not provide green groups with enough support. Cristina mentions that there is "no one for students to go to if they want to do a project," and so it becomes easy to get lost. Joe Pearl recommends that having "more administrative positions" would make administrators much more accessible to students.

However, with the exception of a few complaints, both athletics and student life groups tended not to evoke obstacles at the administrative level. The Athletic Department has strong administrative support, and there are many paid positions within athletics that are geared towards communication between students and the college. Similarly, most student life groups have an administrative advisor or director that they can contact for support, and who oversees and facilitates meetings.

Coordination

Various issues relating to coordination hinder communication between groups on campus. Most of

Coordination	**50**
Low Attendance at Meetings and Events	*10*
Lack of Suitable Space	*5*
Time Constraints	*9*
Inefficient/Ineffective Meetings	*8*
Lack of Face-to-Face Meetings	*5*
Lack of Follow-Up After Meetings	*4*
Other	*9*

these issues are the result of poor organization and inefficient meetings.

Face-to-face communication is the next most popular alternative to blitz at Dartmouth, but it is evident that in-person contact is problematic as well. In Tucker, Kate Petcosky emphasizes how face-to–face communication doesn't happen enough. One of the main reasons for this inefficiency seems to be time constraints. Student Athletic Advisory Committee (SAAC) President Katie Horner suggests a reason for this is that "it is hard to get a group of people together in one room at the same time on different schedules."

Blitz is a much quicker and more convenient method of communication. Within the Athletic Department Anne Hudak, Assistant Athletic Director for Student Enhancement, Joann Brislin, Assistant Director of Physical Education and Recreation for Intermural and Club Sports, and Shadara MacNicol also suggest that there aren't enough face-to-face- meetings, and that having more of them would improve communication in the department. When meetings do occur at Darmouth, they are often under-attended and not as productive as people would like. Karen Orrick, Student Director of Religious and Spiritual Life at Tucker, estimates that her Student Religious Leader meetings on a good day only attract about 20% of the people they target. In the Athletic Department, Barry Harwick, Head Coach for Varsity Track and Field, specifically highlights that the 10A x-hour, 2As, and lab periods often conflict with practice time or scheduled team meetings. As a solution, multiple student groups interviewed suggested that having a large campus calendar would be helpful for organization of such meetings.

Helen Damon-Moore emphasizes the importance of "effective meetings": those that are purposeful, tightly run, and have a follow-up. James Kim seconds Helen's inclusion of follow-up as being an integral part of a productive meeting, arguing that, "communication is important before, during, and after meetings." Kate Petcosky notes how there are too many meetings about meetings. Although there have been recent attempts to bring together green groups in periodic all-inclusive meetings, many people we spoke to felt that these meetings were inefficient. One example of an attempt to bring green groups together were the "green group dinners" in Fall 2010 which included members of all green groups on campus. While some people felt these meetings were helpful and like the idea of having all the green groups come together, others found the meetings unstructured. Specifically, Annie Laurie Mauhs-Pugh describes them as "intimidating," Cristina Pellegrini feels they were "disastrous" because there was little mutual understanding and organization, and Sarah Frostenson says they were not successful because it

was "impossible to please everyone." The inefficiency of these meetings in the past has hindered communication today.

Administrative Assistant Kathy Boivin characterized Tucker's physical plant as "very important" to communication. As a central physical space, the Tucker Foundation makes communication possible by way of office visits, and is also available as a group meeting place. Hillel is one part of the Tucker Foundation that is physically removed from the South Fairbanks headquarters of the Foundation. This separation has consequences, according to Karen Orrick. Not all groups see themselves related to Tucker, she says, citing in particular Hillel's independent social space as a cause of such a perception. Additionally, because the Athletic Department does have a physical space, few in the department articulated the problems associated with not having such a space in which to meet with one another. Unlike some other umbrella groups, green groups lack a physical place where they can gather. Sarah Alexander thinks a central location is the first step towards generating inter-group communication. Cristina Pellegrini acknowledges that the Sustainable Living Center was introduced with this idea in mind, but it has not served that purpose. She thinks green groups need a place that they can use as both a social space and as a resource. Sarah Frostenson agrees, and believes that the new Sustainability Resource Room (Robinson Hall 108) is a small but significant first step towards that goal. Groups need to demonstrate to the college that they are taking advantage of this room, she says, so that they can ask for a larger, more permanent space in the future.

Another barrier to effective coordination is fragmented student populations. Helen Damon-Moore, Tucker's Director of Service and Educational Programs says that Dartmouth is "a pretty territorial or segmented place," which is perhaps unexpected given the school's relatively small size. Adds Helen Damon-Moore, "You have to really want to communicate across lines." One student mentions that the Korean Student Association and the PAC in general could benefit from more events hosted by umbrella organizations such as OPAL or Council on Student Organizations (COSO). She feels that this could help bring different student groups closer together. A member of COSO also mentions that the process by which students can create groups and receive funding could be more streamlined and accessible.

Other Media

Media Other than Blitzmail	22
Outdated Websites	*7*
Lack of Poster Space	*4*
Lack of Non-Blitz Communication Channels	*9*
Other	*2*

Although Blitzmail was the most commonly identified obstacle to effective group communication at Dartmouth, various other forms of media are used as avenues for communication on campus and thus carry their own obstacles to the flow of information between groups. These media include, but are not limited to, websites, posters, volunteer fairs, Hinman Box mailings, chalking, forums, social media, clothing, events calendars, and newspaper advertising.

The general consensus among Tucker, the Athletic Department, student groups, and green groups was that reaching out to the greater campus population can be difficult and ineffective due to the lack of established communication channels. Websites, for example, are often outdated, unreliable, and difficult to maintain. "Websites are a whole job unto themselves," Kurt Nelson explains. Kurt Nelson is affiliated with the United Campus Ministries, and adds that it's hard to represent twenty-five disparate groups on one website. Karen Orrick confesses that she is not sure if the Multi-Faith Council, with which she is involved, has a website or not. Student groups with existing websites said that keeping a website up to date is difficult and time consuming, while several groups without a website cited time constraints as a barrier to creating a group website. The ICC, for example, is paying someone to create a website for them rather than expending the group's time creating their own. Because The Dartmouth, the primary campus newspaper, has limited and sporadic coverage of varsity athletic results and highlights, most people search for athletic information on the department's website rather than in the College's newspaper. Barry Harwick stresses, however, that websites need to be improved in order to become more informative and reliable.

Besides websites and Blitzmail, posters were a frequently cited form of communicative media in student organizations. Within Tucker, every interviewee mentioned posters as one of the first methods for outreach to campus about events or meetings. It is not surprising then that Brian Freeman considers posters over-used. It's hard to find poster space, he adds, "You're just one poster among hundreds there." A general complaint from many of the student life organizations in particular was that Dartmouth does not offer enough suitable venues for posters, and posters that are put up often go unnoticed. The Ecovores have also used posters and food to

attract people at events like the Dimensions Fair and the Earth Day block party. These methods seemed to be effective, but large events are so few and far between that they do not do much to get the group's message out to the student body. The Organic Farm uses tabling and banners from time to time, but again, not often enough to make a substantial impact. Eric Ramsey mentions that, because successful methods of communication are neither established nor identified, students often stop advertising after sending a blitz and making a poster. He says that the most successful advertising campaigns involve many different types of media with a common, noticeable theme.

Social Connections/Personal Relationships	**46**
Strong Personal Relationships	*7*
Personal Outreach	*14*
Involvement in Multiple groups	*13*
Reputation/Status	*19*
Centralized Campus	*1*
Other	*1*

EFFECTIVE METHODS

As in the the proceeding "Obstacles" section of this chapter, we identified several significant trends across the four identified umbrella groups with regard to effective group communication methods. These similarities were divided into three broad categories, which will be detailed in this section: Social Connections/Personal Relationships, Existing Group Communication, and Group Organization.

Social Connections/Personal Relationships

Interviewees in all sectors of campus emphasized the boost that social relationships and personal connections can have on communication, both within the group and among other campus groups. Kate Petcosky, Volunteer Coordinator at Tucker, highlights the fact that unless a pre-existing rapport links individuals within two different groups, one group may find it is difficult reaching out to another if those particular groups have not communicated in the past.

On the flip side, subjects note that the overlap and participation of one individual in two or more groups can contribute to effective communication between groups. For example, Katie Horner advises individuals to "find groups you have your hands in already [and] try to get involved in [their] organization". This allows individuals to tap into resources they normally wouldn't have available to them, she says. Nora Yasumura, OPAL's Asian and Asian American Advisor, mentions that one reason the PAC has exceptional communication is that it encourages

students to participate in multiple Asian organizations. Karen Orrick credits these "social structures" with the building of responsive networks.

Within green groups, Cristina Pellegrini highlights how the overlap between members allows ideas to be passed from one group meeting to another. Sometimes, however, these informal linkages are all that exist. Jenna Musco, Logistics Leader at the Organic Farm, states that a "handful of members, especially freshmen" are connected to other groups, but that these links serve as the most formal ties between the Organic Farm and other environmental groups.

Interviewees also discussed the advantage of personal, individualized outreach. Katie Horner suggests that the athletic department develop personal relationships with members of other groups so that when contacted, these members can put a name and face to the department, a strategy also endorsed by Karen Orrick of Tucker. James Kim says, "if [students or others] know us Chairs personally, it helps." Specifically, Brian Freeman, President of Hillel, advocates person-to-person advertising for events because, he says, people are more likely to go if they think a friend is going. Associate Athletic Director for External Relations Samuel Hopkins agrees, arguing that an email is "as effective as the person who sends it."

Members of green groups also agree that personal outreach is one of the most efficient communication tools. Sarah Alexander explains that in order to get any traction for her group, she had to personally blitz someone who she heard was very involved in sustainability. Joe Pearl says he tries to communicate by asking friends in other groups to list his events in their weekly blitz. Personal outreach to leaders of groups in particular is one of the most effective ways of communicating.

Another important consideration related to social connections is the reputation of a group, or the perceived social status of its members. DREAM is a mentoring group whose members have traditionally been well-known and visible around campus, according to Greg Goldstein. It was featured as a "cool" volunteering opportunity in an edition of The Dartmouth sent to all the members of an incoming class before matriculation. James Kim describes Big Brother Big Sister (BBBS) as a lesser-known mentoring organization. Even though both groups have approximately the same number of student mentors, far more students apply to DREAM, which results in the much lower acceptance rate.

Elsewhere, the College Democrats also rely strongly on their name and reputation to rally support. Nick Devonshire believes that the main reason the Big Green Bus communicates well

with the student body is because it is tapped in to the "pop culture" of Dartmouth. This explains why the Bus is one of the few instances where interest in sustainability transcends to the wider student body.

Apart from group membership, the reputation of a specific event can significantly affect attendance. Brian Freeman stresses how the Passover Seder and the Shabbat 400 generate large audiences because they have become an established tradition for Jewish students on campus. Samuel Hopkins states, "there is no bigger event in the Upper Valley than a Dartmouth Football game." Christina Supino on the other hand says that in spite of the track and field team being "one of the largest on campus," attendance is not as high as the team would like, and more interest could be generated if there was a way to increase publicity and the track team's reputation.

Though informal methods of communication based on friendships and social status are unscientific, groups can take concrete steps to foster these connections. For example, Ahmad Nazeri has instituted a termly dinner, retreats, and other social events among the Tucker student directors.

Existing Group Communication

Existing Group Communication	**103**
Blitz as an Accepted Form of Communication	*24*
Centralized Physical Space	*6*
Consistent Weekly Blitz	*9*
Scheduled Group Meetings	*28*
Banners	*1*
Inter-group Meetings	*11*
Other	*24*

Though the drawbacks of Blitzmail and in-person meetings were highlighted earlier in this chapter, interviewees also had plenty to say about the upside of these and other forms of communication.

Scheduled, face-to-face meetings are perhaps the most effective form of communication in Dartmouth Athletics, endorsed by many interviewees within the department. As Anne Hudak states, it's hard for "a face-to-face meeting…not to be effective." Shadara MacNicol adds that "you can also get all of the information at one time instead of it being segmented, which is usually the case with e-mail."

Green groups felt similarly. Annie Laurie Mauhs-Pugh states that "people who are the most active have informal meetings all the time," but formal, group-wide meetings certainly serve a purpose because they get people talking. Cristina Pellegrini, a past member of the student SLC advisory committee, describes SLC meetings as being very effective and enjoyable, and one

of the few times when tangible progress was made. Agendas were blitzed out beforehand and people left with assignments for the next meeting. Sarah Frostenson is also pleased with the way Sustainable Dartmouth meetings are organized every other week. Though the top three interns meet privately with the Director of Sustainability, the larger group meetings with all eighteen interns are evidence of coordination throughout the entire group.

The availability of space is important when it comes to face-to-face meetings. Student life has capitalized on the fact that Collis offers rooms that can be reserved. Furthermore, COSO and OPAL, which oversee most of the student life organizations, are located within Collis, so students have an easy time reaching administrators in most cases.

Some interviewees talked about targeted in-person meetings that unite groups that normally do not encounter one another. Within student life, these meetings are facilitated by outreach coordinators who have the job of contacting other groups and people. Helen Damon-Moore has a similar job in the Tucker Foundation. Through outreach, she has helped to organize the Council on Service and Engagement and The Dartmouth Center for the Advancement of Learning (DCAL), two multi-group organizations that meet regularly. In particular, DCAL brings faculty members together to foster professional growth among Dartmouth's professors. The group has pursued programs like community-based learning, which encourages professors to expand studies out of the classroom into the Upper Valley. DCAL is also considering a program in the fall to integrate sustainability into more courses and academic departments.

Tucker and the Athletic Department are both part of the relatively young Centers Forum, a group that meets monthly and consists of other important programming entities on campus, such as the Rockefeller Center, the Dickey Center, the Hopkins Center, and many more. According to Dean Crocker, new centers on campus want to join each year, and the group has grown larger and more influential. In large part, the Centers Forum developed to change the atmosphere surrounding programming at the school from competitive to cooperative. For Dean Crocker, the Forum has facilitated a "shared vision" and a "sense of common purpose" among the centers involved.

While most respondents recognize the limitations of Blitzmail, many have developed strategies to communicate effectively within the email provider. Sy Mukherjee, the Vice President of the College Democrats, emphasizes that simply asking people over blitz if they are available to help with an event will not generate a large response group. A far more successful

way to have members contribute time is to send out a list of time slots, and have everyone reply-all until these slots are full. By making the list of who is working viewable to everyone, people are less likely to avoid their duties.

Another method that several groups use is a weekly blitz sent to all of campus describing upcoming events. Having an event listed in various groups' "This Week in…" blitzes is a helpful way to spread the word, according to Joe Pearl. Nick Devonshire argues that consolidating all information into one place allows people to absorb it more easily. Weekly blitzes are often put together by interns, and in the case of the PAC, Asian groups often compete to have their events included.

The KSA uses blitz in yet another unique way. They use their blitz list daily to discuss various issues. Their list has become similar to a social list, which creates more of a sense of group cohesion.

Group Organization

Group Organization	18
Elections	*3*
Staff Support	*6*
Streamlined Funding	*3*
Paid Interns	*6*

Group organization is a central focus for many student life groups. Strong organization, such as hands-on participation by a staff member, can help bridge the gap between terms and helps mitigate the problem of student turnover, according to Nora Yasumura. Many of the student life groups have executive boards that are decided by election. Nora Yasumura explained that she requires all of the groups associated with the PAC to have termly elections, and she says this helps keep groups looking ahead despite the fragmented time spent at the school. COSO and OPAL also help keep student groups organized in that it is easy for groups to know where to go to receive funding.

In Tucker, the Student Director model was piloted this year. Greg Goldstein and James Kim note that more collaboration occurs between Tucker groups now, as a result of the paid interns that make up the Student Director program. Greg Goldstein believes that this model will grow even stronger as it becomes more established.

Group organization will be discussed in greater depth in the Discussion section of this chapter, where we examine two instances of effective communication as a result of a well-defined structure within campus groups.

DISCUSSION:

In this section, we use the preceding overview of obstacles and effective communication methods within the Tucker Foundation, the Athletic Department, student life groups, and green groups as the basis for proposed improvements in communication flow between the various sustainability groups on campus. For a full break down of the obstacles and effective methods to communication see Appendix C.

Applying already established, effective communication methods to green groups could improve their coordination and encourage the development of their sustainability initiatives. Through our interview process, we found two groups on campus that we determined to have a successful communication structure that green groups could model their behavior after. These groups are the Dartmouth Outing Club and the Pan Asian Council.

Dartmouth Outing Club

As we began to discuss a potential effective model for the Learning/Culture Working Group to use in the implementation of Dartmouth's new sustainability initiative, we immediately looked to the Dartmouth Outing Club (DOC) as an example of a student-run organization with a very efficient, institutionalized means of communication. Alice Bradley, a former president of the DOC, outlined the structure of the organization's communication system. We used her description of the group's communication structure to create a visual model, specifically a flow chart, for the working group's reference.

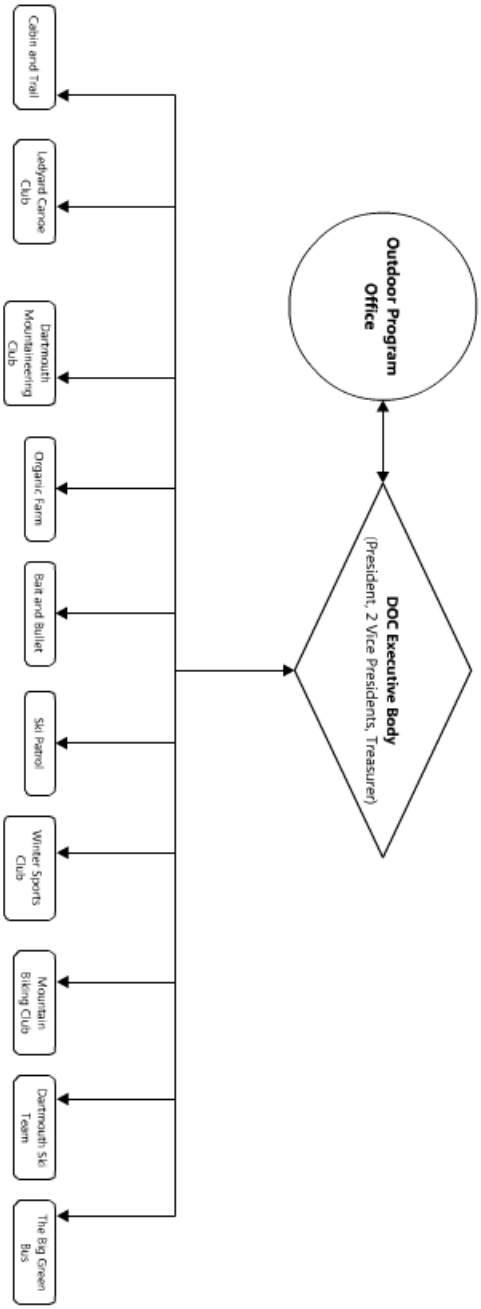
In terms of leadership and overall group organization, an executive committee of a peer-elected president, two vice presidents, and a treasurer meet once a week with the leadership of the DOC's ten sub-clubs. The information discussed in these weekly meetings, known as directorates, is then relayed by individual sub-club heads to the greater membership of their specific organizations. This information exchange can occur either via blitz or through face-to-face meetings, but the general consensus is that communication between the DOC's executive committee and its larger membership is both streamlined and effective.

Alice Bradley acknowledged the role of the Outdoor Programs Office (OPO) in the administrative structure of the DOC. The DOC pays the OPO for administrative help and acts as a liaison between the DOC and the rest of Dartmouth's administration. The OPO's involvement in the DOC's decision-making processes, however, is limited due to the fact that the DOC is

entirely internally funded. Although the leaders of the sub-clubs do occasionally meet with the OPO independently, these meetings focus solely on internal issues pertaining to specific clubs rather than on the distribution of information throughout the DOC as a whole. We subsequently limited the OPO's function in the flow chart to include only interactions with the DOC executive committee.

Alice Bradley also identified notable strengths and weaknesses in the DOC's communication structure that could be helpful to green groups as they develop a new communicative structure. One of the most prominent positive attributes of the current system is the simplicity of the DOC's communication structure. Because of the hierarchical levels of leadership, groups can rely on their respective leaders to communicate important information from the greater DOC rather than wait to receive a mass blitz from a single, DOC officer. This simple model leads to a transparent and effective dialogue between both the DOC leadership and the membership of its sub-clubs. An identified downside of the hierarchical structure depicted in the flow chart is that the information does have to be filtered through several channels, which can lead to both time delays and occasional miscommunications. In order to counteract these shortcomings, Alice Bradley would send infrequent blitzes to the entire membership in order to touch base once or twice a term without bombarding a large population of students with redundant or unnecessary information.

Figure A. Organizational Structure of the Dartmouth Outing Club



Pan Asian Council

The Pan Asian Council (PAC) is organized, with the help of its advisor Nora Yasumura, in a fashion that has encouraged good communication amongst the many different Asian and Asian-American student groups. There are over 20 Asian and Asian American student groups, but they are brought together in such a way that collaboration and communication are relatively easy and effective. Nora Yasumura has done a lot to help make this structure "sustainable," not environmentally sustainable but sustainable in that the groups continue over the long term, through several methods. She feels that the organizational structure of each group should focus on being "sustainable" because of the 4-year turnover of students. It is important that freshmen members of the group are encouraged to keep interest and continue to work with the group throughout their four years at Dartmouth. If groups' messages are not passed along, it's likely that the group will fade out. To promote a group's continued presence on campus, one thing the PAC organizes is an annual recognition banquet that students often feel honored to go to. This embeds leadership early and encourages underclassmen to participate in groups throughout their time at Dartmouth.

Beyond the individual groups, the structure of the PAC must also encourage future participation. To do this, the PAC requires each group to have an end-of-the-term election to pick a liaison to the PAC, and those selected meet at the beginning of the following term. Nora Yasumura said that by having elections at the end of each term, groups stay motivated to continue working after the break. She also stresses that the council is not a council of representatives of each group, but rather they are liaisons acting as a communication bridge and relays the minutes of each meeting to their respective group. In other words, it is important that the PAC meetings act as a cooperative discussion rather than twenty-some different ideas being simultaneously introduced.

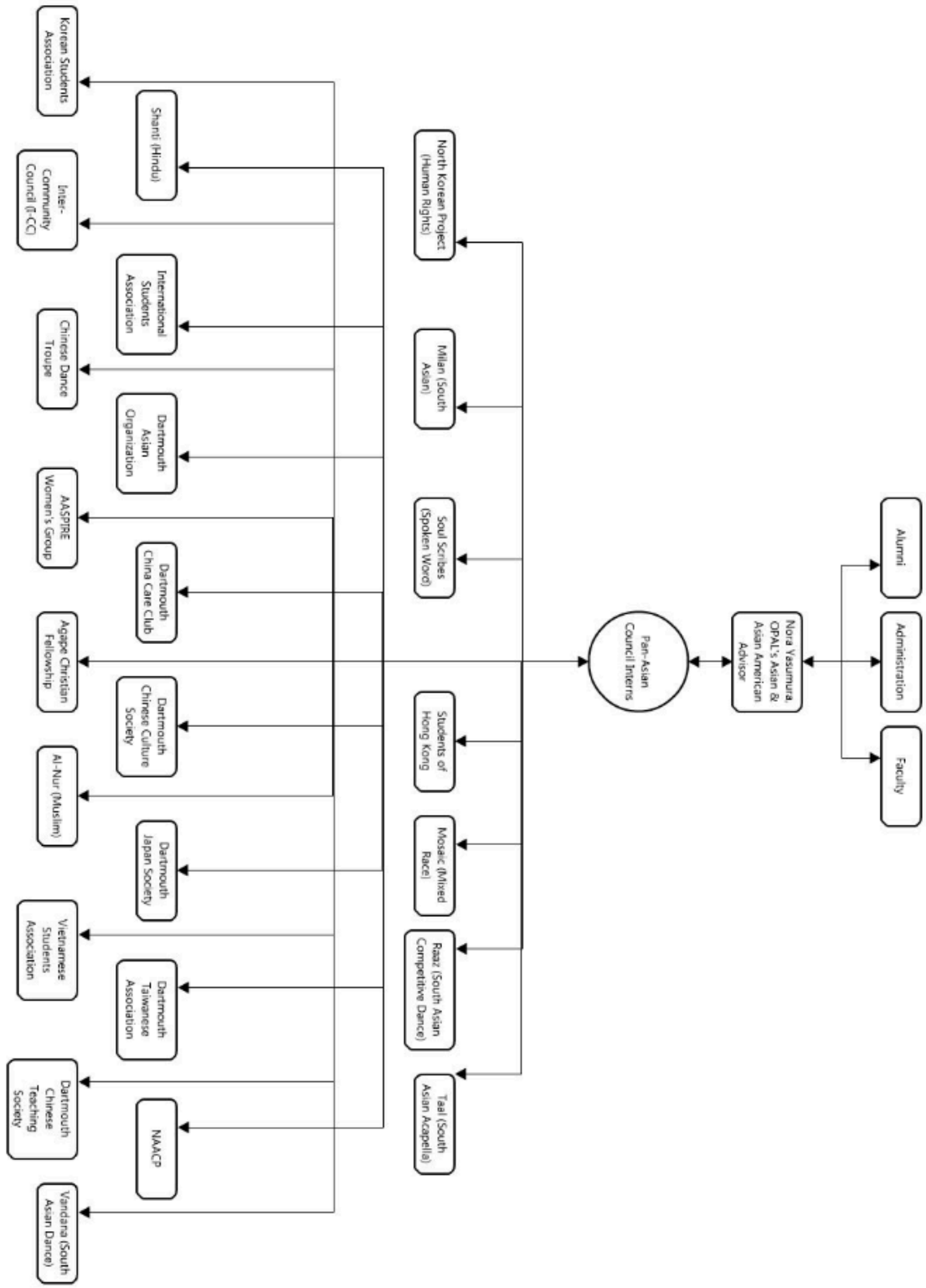
The PAC has the challenge of bringing many Asian organizations together in order to focus their mission—a challenge similar to those faced by the "green" groups on campus. Nora Yasumura stressed that the council must be collective without threatening the individual parts, and that it must encourage mutual benefits without harming each group. The advisor's job in the PAC is to lead, but also to facilitate communication between the PAC and other groups. Yasumura said that there must be a balance between facilitating and leading. In order to do this,

it is important to consider the culture and mission of each group and try to incorporate these into collaboration methods.

Within the PAC, there are interns that help facilitate communication and collaboration between groups. Each week, the interns blitz out all events in the "This week in the Pan Asian Community" blitz. The blitz has become something established, and the interns do not need to ask each group for their schedule, rather, groups feel that they need to send in their events. The blitz also helps prevent conflicts between two different groups' events. It is important to avoid overlap not only for logistics, but also because it allows students who are interested in multiple groups to attend both events.

The PAC has demonstrated an exceptional ability to sustain communication among groups that have similar goals but historically weak linkages. The PAC's role as a collaboration facilitator has given student groups an easy way to find other groups with similar goals and helps them work together. Without careful consideration of cultural aspects of the student groups, a cohesive network like the PAC may not function as efficiently. In order to structure Dartmouth's green groups in a similar way, it will be important to create a structure that will fit the culture of the green groups. The challenge for green groups will be finding a common element of all groups that will help bring them together.

Figure B. Organizational Structure of the Pan Asian Council



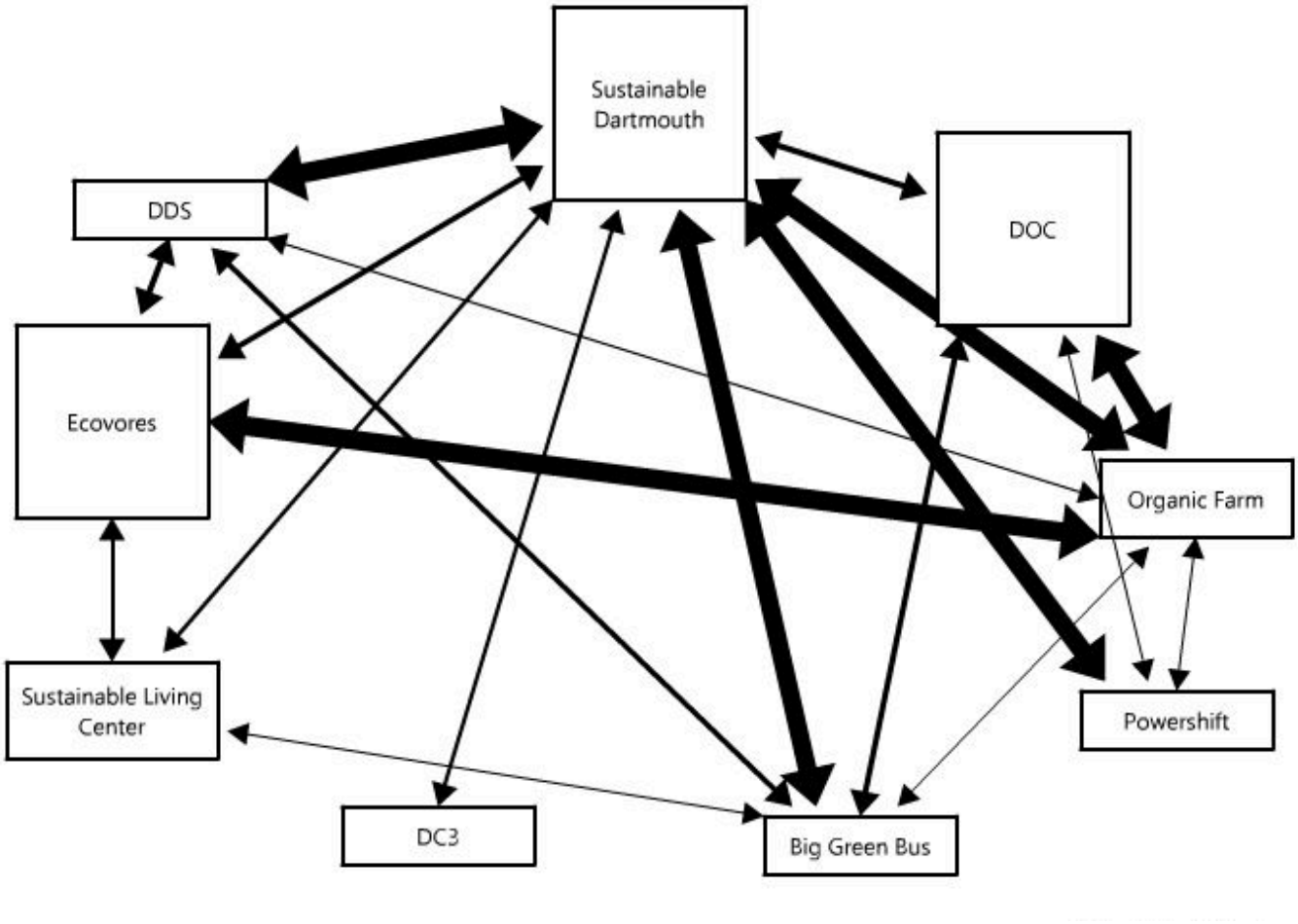
Green Groups

Green Groups on campus operate within a communication system that lacks both the structural organization and the sustainability of the Dartmouth Outing Club and the Pan Asian Council. Sustainable Dartmouth is one of the largest and most widely recognized green groups, with a formal internship program that pays eighteen student interns. These interns operate under three teams: Projects, Programs, and Innovation and Research. Three primary interns – one of whom serves as the "head intern" – serve as liaisons between the rest of the interns and the Director of Sustainability.

Although Sustainable Dartmouth is generally considered to be the umbrella group for all campus green groups, not all groups report back to Sustainable Dartmouth, at least not on a regular basis. Communication between groups is varied and inconsistent because there is no established channel for the flow of information. Thus, certain groups communicate to a large extent with some groups, and not at all with others. The fact that different groups use various sources of funding isolates them even more.

The skewed exchange of information between groups is represented by the thickness of arrows in the flow chart below. Arrow thickness is determined by interviewee rankings of their degree of communication with various other green groups. Groups that communicate regularly and often are connected by thick arrows, while those who rarely communicate are connected by thinner arrows. Groups that communicate a negligible amount are not connected by arrows at all. This flow chart is meant to highlight the inconsistency in communication among green groups. Ideally, the chart would look more like those of the DOC and PAC, with the same arrow thickness connecting all groups, and each group communicating with Sustainable Dartmouth the same amount.

Figure C. Current Organizational Structure of Green Groups at Dartmouth



CONCLUSION:

Barriers to communication, coordination, and effective organization structures have curbed the missions of green groups at Dartmouth for many years. The lag in sustainability on the Dartmouth campus has not been due to a shortage of good ideas, or a dearth of talented or dedicated individuals interested in sustainability, but in many cases, efforts to improve sustainability have fallen short of their goals. Dartmouth's green community is not alone in experiencing difficulty with communicating, for the same concerns were found in all of the campus sectors that we identified, from the Athletic Department to student life groups to the Tucker Foundation. However, there are successful practices and models in place at Dartmouth, such as those of the PAC and the DOC, that should serve as an example for the green community.

Through our interview process and the study of several groups with exemplary communication methods, we have generated a short list of recommendations to improve communication among green groups at Dartmouth:

1. Create and promote a physical space designated specifically for green groups

Sustainability-minded individuals need a space in which they can congregate and exchange ideas. Student life groups, the Athletic Department, and the Tucker Foundation all have a more central physical space than do green groups, and many interviewees noted the advantage of such a recognized location. This space should be open to all groups, and utilized for meetings, event planning, and other activities. As Cristina Pelegrini notes, a central space could also have a social element to it and tap in to the power of social networks at Dartmouth. The location should be publicized as a place where individuals who are not already involved in sustainability groups should feel welcome to walk in, hang out, receive information, and get involved.

2. Centralize funding for green groups and sustainability-related projects

The multitude of funding sources currently used by green groups only increases the fragmentation that already exists between groups at Dartmouth. In order to encourage collaboration, decrease ambiguity, and break down the "silo-ed" nature of the Dartmouth campus, one central source of funding should be established for use by all green groups and

sustainability-related projects. The DOC is a model of a group built around a single source of funding.

3. Use targeted rather than general outreach to build networks

Interviewees in each umbrella group noted the difficulty of reaching out to all of campus given a lack of proven methods. Interviewees also recognized the advantage of more personalized communication.

Green groups should make use of informal ties that members possess with other parts of campus, even if these other parts of campus have not interacted with sustainability initiatives before. One particular strategy would be to target high-profile and visible groups, events, and traditions to expose the campus body to models of sustainability ingrained within Dartmouth culture.

4. Develop an interactive website or online forum for green groups that is consistently maintained by a designated individual, and includes a calendar of events

While many interviewees pointed to websites as a powerful avenue for communication, many also at the same time expressed frustration with their current websites. We believe that a well-designed and maintained website is a worthy goal despite inherent difficulties. Though there is a gap between how groups use the internet to communicate and how they ideally imagine themselves using the internet, this gap will likely close in the future with improved technology. In particular, the website should be accessible, readable, and updated often. Website maintenance will undoubtedly be time consuming, so holding a designated sustainability intern responsible for its upkeep would be preferable. This website should include a "Green Calendar" in order to provide a standardized arena for event advertising and listing.

5. Create a council for green groups facilitated by Sustainable Dartmouth and modeled after the structure of the DOC or PAC

Groups on campus with the best communication systems all utilize weekly meetings in which leaders of sub-groups are all brought together at a designated time. The implementation of weekly meetings among green groups is perhaps the most crucial step in order to increase coordination and collaboration. Sustainable Dartmouth should be used as a mediator of these meetings, and Rosi Kerr, Director of Sustainability, should be viewed as a staff resource for all of these groups. In addition, her presence will ensure the continuity of meetings and progress through the entire year. These meetings must be efficient and structured, and include adequate

follow-up, so that they are seen as worthy of the time they require. Groups must buy in to the broader goal of Sustainable Dartmouth, which should be to spread a culture of sustainability to the wider campus. Green groups must also still feel they are still autonomous, even as they operate under a more-defined Sustainable Dartmouth umbrella. In this regard, Nora Yasumura's work in the PAC can be seen as an effective model.

For many years, the Green community at Dartmouth has been passionate and driven, but isolated in many ways from the rest of the student body. By adopting structural changes to unify and centralized Dartmouth's green groups, and by tapping into networks to boost sustainability's reputation and effectiveness, the mentality necessary for real changes can be spread from a core of dedicated individuals to the campus as a whole.

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Appendix A: List of Interview Subjects and Their Positions on Dartmouth Campus	
Interview Subjects	**Position**
Tucker Foundation	
Ahmad Nazeri '11	Student Director, Tucker Foundation
Brian Freeman '11	President of Hillel
Greg Goldstein '11	Student Director for DREAM
Helen Damon-Moore	Director, Service and Education Programs
James M. Kim '11	Student Director for Big Brother Big Sister
Karen Orrick '11	Student Director, Office of Religious and Spiritual Life
Kate Petcosky	Volunteer Coordinator
Kathy Boivin	Administrative Assistant
Kurt Nelson	Assistant Chaplain
Richard Crocker	Dean of Tucker, College Chaplain
Athletic Department	
Allyson Gittens '12	Women's Club Soccer Captain
Anne Hudak	Assistant Athletic Director for Student Enhancement
Barry Harwick	Head Coach Varsity Track and Field
Brain Mann	Director of Football Operations
Christina Supino '12	Captain Varsity Track and Field
Jeffrey Frechette	Head Athletic Trainer
Joann Brislin	Assistant Director of Physical Education and Recreation for Intermural and Club Sports
Katie Horner '11	President of SAAC
Lynn Bixby	Administrative Assistant to the Director
Shadara MacNicol	Assistant Athletic Director for Facilities Scheduling and Event Planning
Samuel Hopkins	Assistant Director Athletic Marketing and Promotions
Virginia Seldon '11	Captain Varsity Swimming
Student Life Groups	
Eric Ramsey	Director of the Collis Center for Student Involvement
Eric Tanner '11	Student Body President
Hannah Kim '12	Korean Student Association Treasurer
Maya Granit '11	President of ICC
Nora Yasumura	Asian and Asian American Advisor
Shin Kyu Park '12	Dartmouth Asian Organization Member
Spenser Mestel '11	COSO Board Member
Stephen Silver	International Student Program Director
Sy Mukherjee '12	College Democrats Vice President
Uthman Olagoke '11	Dartmouth Asian Organization Vice President
Green Groups	
Alice Bradley '11	Former President of Dartmouth Outing Club
Annie Laurie Mauhs-Pugh '14	Active member of Ecovores and Organic Farm
Cristina Pellegrini '11	Member of Ecovores, Former Head of House of Sustainable Living Center, Involved with Organic Farm and DDS
George Thorman '11	Work Leader for Organic Farm
Jenna Musco '11	Logistics Leader for Organic Farm
Joe Coleman '11	Member of Big Green Bus
Joe Pearl '11	Education Leader for Organic Farm, also involved in Ecovores
Kelly McGlinchey '12	Intern at Office of Sustainability, former DDS Food Intern
Matt Dahlhausen '11	Involved with DOC, SLC, Committee to Create Sustainability Minor, Other Sustainability Groups
Nick Devonshire '11	Member of Big Green Bus and Involved in many other Dartmouth Sustainability groups
Sarah Alexander '14	Organized Dartmouth component of Powershift Youth Environmental Conference in Washington, DC in 2011
Sarah Frostenson '11	Head Intern at Dartmouth office of Sustainability

Appendix B: List of Interview Questions

1) What aspects of your group's mission require communication between the various members?

2) By what methods do you communicate with other members in your group, and how often (daily, weekly, monthly)?

3) How effective at connecting to the members of your group do you feel these communication methods are?

4) How might this communication be improved so that it were more effective?

5) By what methods do you communicate with other groups like you on campus?

6) What do you feel you have achieved through communication with other groups (in both a general sense, and in terms of specific projects, if possible)?

7) Why or why not is your communication between groups like yours effective? How might it be improved?

8) How do you communicate the group's message and activities to the wider campus body? Do you feel this is effective? How might it be improved?

9) Are there specific populations within the Dartmouth community that you feel you have difficulty in reaching? (E.g. faculty, staff, administrators, specific student groups, etc.)

Appendix C:

The tables below break down the various obstacles to communication and effective methods of communication brought up during the interview process. The left column lists a specific issue or method, and the corresponding right column lists the number of times that an interviewee mentioned a specific issue or method.

Table A. Obstacles to Communication Amongst Student Groups at Dartmouth
The table below lists and categorizes the number of times various obstacles to communication were brought up during all interviews.

Obstacles	Number of Mentions
Issues with Blitzmail	**47**
Unresponsiveness	*10*
Miscommunication	*5*
Time Delay	*8*
Limited Design Capabilities	*3*
Overuse	*13*
Other	*8*
Student Culture	**45**
Apathy/Shallow Involvement	*9*
Over-commitment to Multiple Groups	*7*
Lack of Continuity (D-Plan)	*7*
Student Turnover	*3*
Fractured/Insular Student Groups	*15*
Unclear Leadership	*1*
Other	*1*
Administration and Administrative Structure	**19**
Lack of Funding	*4*
Lack of Administrative Support	*8*
Other	*7*
Coordination	**50**
Low Attendance at Meetings and Events	*10*
Lack of Suitable Space	*5*
Time Constraints	*9*
Inefficient/Ineffective Meetings	*8*
Lack of Face-to-Face Meetings	*5*
Lack of Follow-Up After Meetings	*4*
Other	*9*
Media Other than Blitzmail	**22**
Outdated Websites	*7*
Lack of Poster Space	*4*
Lack of Non-Blitz Communication Channels	*9*
Other	*2*
Total	**183**

Table B. Effective Communication Methods Among Student Groups at Dartmouth
The table below lists and categorizes the number of times successful, existing methods of communication were brought up during all interviews.

Effective Methods	Number of Mentions
Social Connections/Personal Relationships	**46**
Strong Personal Relationships	*7*
Personal Outreach	*14*
Involvement in Multiple groups	*13*
Reputation/Status	*19*
Centralized Campus	*1*
Other	*1*
Existing Group Communication	**103**
Blitz as an Accepted Form of Communication	*24*
Centralized Physical Space	*6*
Consistent Weekly Blitz	*9*
Scheduled Group Meetings	*28*
Banners	*1*
Inter-group Meetings	*11*
Other	*24*
Group Organization	**18**
Elections	*3*
Staff Support	*6*
Streamlined Funding	*3*
Paid Interns	*6*
Total	**167**

Conclusion

In Maureen Hart's independent analysis of sustainability practices at Dartmouth College, the consultant advises, "Dartmouth needs to instill a culture of sustainability into the policies, practices, and everyday activities of all members of its community" (Hart, 2009). The focus on "all" members of the Dartmouth community is particularly crucial given the findings in the four sections of this report. Taken together, the four chapters of this report outline a culture of sustainability that exists among a core group of Dartmouth students but that has failed to penetrate the broader consciousness of the entire campus.

In Chapter One, four important sustainability projects were examined to determine commonalities between them. Though each has been significant to Dartmouth and the green community within the college, the four also share distinct frustrations and limitations. The Sustainable Living Center is characterized by many students as falling well short of its main goal to educate the greater campus about environmentally friendly living. The Dartmouth Organic Farm has served as an educational tool and a social and extracurricular space, but it is understaffed and underfunded. GreenLITE has garnered more positive attention outside of Dartmouth than among the student body. Lastly, the Big Green Bus, though a national attention-grabber that has raised credibility for Dartmouth's environmentalism, is an organization that logistically can only accommodate a small group of students each year. These projects have all been successful in their own way, but they are equally notable for the limitations that have caused them to fall short of their potential.

Chapter Two examined two important sub-cultures on the Dartmouth campus that have been far removed from or resistant to sustainability initiatives. Though members of both the Athletic Department and the Greek Organizations at Dartmouth expressed a confidence that these sub-cultures possessed the status to be leaders and models of sustainable behavior on campus, the elements within the sub-cultures antithetical to change seem unlikely to disappear any time soon.

Sustainability within Dartmouth academics was the topic of Chapter Three. Again a schism was identified. Some departments displayed a high compatibility with messages of

sustainability, while others saw themselves as having little to do with sustainability at Dartmouth. On the positive side, a plurality of students expressed a desire to integrate sustainability into their major departments' curricula, and a survey showed plenty of room for improvement in the student body's knowledge of sustainability as it relates to Dartmouth.

Chapter Four explored common obstacles and effective methods of communication within and between groups on the Dartmouth campus. A unified and centralized green community will likely have more success in reaching out to students and other members of the Dartmouth community who are not presently engaged in sustainability initiatives. Green groups must see the benefits of increased communication to allocate resources toward such coordination rather than to their individual projects.

In all of these chapters, it is clear that for however important it is to certain segments of the Dartmouth population, sustainability has yet to be infused into the Dartmouth culture at large. Many possible avenues for extending the reach of sustainability at Dartmouth were identified in the report, from increased administrative support in the form of staffing or funding, to improved networks and communication methods, to incentives for sustainable behavior for dominant sub-cultures, to the enhancement of sustainability within Dartmouth's curriculum. A combination of these approaches will importantly signal that Dartmouth is truly determined to make itself a green campus, while providing the best opportunity for real, successful change.

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