An Evaluation of Messiah College’s Sustainability Studies Major & Survey of Best Practices

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Sharpening Intellect | Deepening Christian Faith | Inspiring Action

Messiah College is a Christian college of the liberal and applied arts and sciences. Our mission is to educate men and women toward maturity of intellect, character and Christian faith in preparation for lives of service, leadership and reconciliation in church and society.
I. Introduction

Messiah College’s sustainability studies major can trace its roots to Francis Eane’s, a 2009 graduate who formulated this major through his senior honors project. The major was first offered in the fall of 2010 and replaced the Environmental Studies major. It is an interdisciplinary program that focuses on the humanities, social sciences, and natural sciences. The curriculum is designed around a set of core courses and the choice of one of three concentrations in community & urban development (CUD), sustainable public policy (PP), or sustainable agriculture (AG); and a practicum or internship experience.

Since its creation, four students have graduated with a Bachelor of Arts degree in sustainability studies. The major now boasts 9 seniors (6 CUD, 3 AG), 5 juniors (3 CUD, 1 AG, 1 PP), 7 sophomores (3 CUD, 3 AG, 1 PP), 5 first years (2 CUD, 2 AG, 1 PP), and 6 minors: totaling 25 majors and 6 minors (as of spring 2013).

With the major in its fourth year, the time had come to assess the experience of the students and the effectiveness of the major. Conversations with my peers about our experience within the major confirmed the need for evaluation and led me to take on this challenge for my senior honors project.

Both primary and secondary research was conducted for this project. Primary research was comprised of online student surveys and student focus group sessions while the secondary research included scholarly reports, articles, and institutional research that focused on trends in the professional sustainability field and in sustainability studies higher education.

This project was undertaken during the 2013-2014 school year with Dr. David Foster, Chair of Sustainability Studies major and faculty advisor for the sustainable agriculture concentration; and Professor Craig Dalen, Campus Sustainability Director and faculty advisor for the community and urban development concentration.

II. Methods

A. Primary Research
   i. Student Surveys

The importance of student voices cannot be overemphasized and serve as the most important indicator of the major’s strengths, weaknesses, and recommendations for development. I conducted surveys for both current sustainability studies students and graduates of the major. Surveys were administered using Qualtrics- an online survey software.
Unfortunately not all students who were sent the survey completed it. Though it was sent to all 20 declared (fall 2013) sustainability majors, multiple times, only 14 completed the survey: 6 first years/sophomores, 5 junior/senior community & urban development, and 3 junior/senior agriculture students. Graduates had a 100% response rate, three of whom were community & urban development concentrations, one in the agriculture concentration.

Because survey responses vary by class ranking, separate reports were created according to class. First years and sophomore responses were combined to form one report since the both had minimal experience with the major’s courses. First years and sophomore responses were therefore not included in the survey analysis. The junior and senior students and the graduates provided the most relevant feedback as they had taken most, or all of, the courses within the major. The junior and senior responses were separated by concentration, while the graduate responses were all combined into one report.

The goal of these surveys is to identify how students view the major’s strengths, weaknesses, and recommendations for development. Students were first asked to identify specific courses that were most beneficial in developing knowledge, skills, and experience in the sustainability field. A series of questions were then asked to identify which component of sustainability (social sciences, economics, environment) students felt most and least competent in. The major’s core was the next topic, with students providing feedback on its overall effectiveness and suggestions for improvement. Students who had selected a concentration then responded to questions about their concentration.

Both graduates and current students were asked about their current or anticipated career goals and how their experience in the major related to those goals. Graduates were asked supplemental questions that provided feedback on their unique experiences since graduating and how they perceive the field of sustainability. All surveys also included open-ended questions pertaining to campus-wide sustainability. Several of these questions related specifically to the major, while others served as prompts for students to articulate their vision for how sustainable practices can be developed on Messiah’s campus.

ii. Focus groups

Following an analysis of the surveys, I held two focus groups to flesh out themes that emerged in the surveys. Focus groups were advertised through mass email to the majors and by word of mouth (with a promised incentive of free food!). Despite this appeal, only 5 students attended- 4 majors; 1 minor. Focus group A was comprise of one AG senior and one senior minor. Focus group B was comprised of two CUD juniors and one CUD sophomore. Despite the small sample size, these discussions were important in providing a forum for students to expand upon questions featured in the survey.

B. Secondary Research

i. Trends in field

While it is critical to enlist the voice of students, this data needs to be supplemented by and compared to the larger, external environment of the sustainability field. This external field includes both trends in
in the job market as well as the structure of analogous “sustainability studies” majors at Messiah’s benchmark institutions.

a. The primary document that was used to explore trends in the professional sustainability field was a 2013 report published by the National Council for Science and the Environmental entitled “Interdisciplinary Environmental and Sustainability Education on the Nation’s Campuses 2012”. This report was selected because it speaks directly to my research topic by exploring interdisciplinary sustainability curriculum and identifying the most important components to include in this curriculum. This study surveyed 231 interdisciplinary environmental and sustainability (IES) baccalaureate or graduate program administrators who rated the importance of 41 knowledge and 38 skill areas that would comprise the “ideal” IES curriculum. I devoted my attention to the skills component research as this was a primary concern articulated in the student surveys.

The report features a factor analysis of the ratings of the 38 skills areas for undergraduate IES programs which revealed seven skill components: Collaborative Engagement, Informatics, Project Management, Personnel Management, Systems Thinking, Technical Communication, and Laboratory & Field Research. Each skill component is correlated with sub-skills that made up that skill area. For example, the sub-skill of advocacy and outreach is the most highly correlated component of the collaborative engagement skill at 0.910. For each skill area, the top three sub-skills (with the exception of Collaborative Engagement which had five due to the extensive amount of sub-skills that correlated with it) were put in a matrix to identify if and how Messiah’s sustainability studies curriculum addresses each skill component. In the matrix, sub-skills are listed in order of most to least degree of correlation, thereby indicating its degree of importance to that skill area.

b. Online scholarly articles and reports were also utilized, with particular attention given to skill development and project-based learning (see Discussion sections B & C) as this was the primary need identified by students.

ii. Benchmark/Competitor Institutions

It is important to survey our benchmark and competitor institution’s curriculum to ensure that Messiah’s sustainability studies major is competitive with analogous majors (i.e. environmental studies) at these institutions. These research results are interspersed in the discussion section. A list of Messiah’s benchmark institutions can be found at http://www.messiah.edu/offices/research/comparison/benchmark.html. A list of state-related and competitor institutions can be found at http://www.messiah.edu/offices/research/comparison/state.html.

III. Results

A. Student survey reports

See “Student survey reports”
B. NCSE matrix
    See “NCSE matrix” document

IV. Discussion

A. Student Survey Analysis*
    *Only junior, senior students and graduate responses are included in this analysis

i. Core Courses

There was an overall consensus that the core provided students with a foundational knowledge of sustainability as 10 of the 12 agreed or strongly agreed with this statement. In regards to students’ satisfaction with the structure of the core, respondents were split. 4 respondents were satisfied with the structure, while 6 were not satisfied (2 neither agreed nor disagreed). 10 of the 12 agreed that additional courses should be included in the core requirements, with requests for management, business and economics courses and more hands-on and upper level classes.

Two students explicitly mentioned that few courses are focused on sustainability. This is due to the fact that the majority of core courses are general education courses, a concept articulated by other students. Certain courses repeated the same introductory material (CUD 9:1, 9:5)(Grad 9:1, 7:2) and are surface level (CUD 9:3, 9:5). As one graduate put it “This isn’t necessarily the fault of the instructor because it was all delivered well and served the general education students well… However as students of the sustainability studies program, I found that the knowledge we learned regarding sustainability was repeated from course to course” (Grad 9:1). In focus-group A, this topic was discussed extensively with members agreeing that the majority of the core courses should not be general education courses. Participants mentioned the difficulty of engaging in and getting excited about these courses as they are in class with other non-major students who often lack the depth of knowledge and interest that sustainability studies students bring to the table.

This is not to mean that the core courses are unimportant. In fact, the opposite is true in that core courses such as Ecology and Sustainability, Environmental Issues & Sustainable Solutions, and Harrisburg Neighborhoods were deemed the most important in the development of knowledge and skills. What the student responses are saying, though, is that there is a desire for more sustainability-focused courses that go beyond introductory material in a general education class setting. If not incorporated into the core, certain upper level, issue specific courses could be included in each concentration- this will be discussed in further detail in sections ii and iii.

Discussion group A brainstormed a creative approach to address the lack of rigorous sustainability focused courses through a 1-2 credit, non gen-ed course that focuses on one specific sustainability topic-offered each semester. Ithaca College, one of Messiah’s benchmark institutions, does something similar to this through their Professional Certificate in Sustainability Leadership program. Through this program students take 6 seminar courses that focus on developing competencies relevant to a sustainability professional (marketing research, project management, leadership development, best practices in
sustainable operations). A certification program like this could partially address the “gen-ed” problem and provide students with more specific, professional skills.

The component of sustainability students felt most competent in was the social sciences and environmental sustainability. As could be predicted, students within the CUD concentration felt most competent in the social sciences while students in the AG concentration felt most competent in environmental sustainability.

Throughout the graduate and current student surveys, the area where students overwhelmingly felt the least competent was economics. This was reflected in the courses that students recommended be added to the core, many of which are business, management, and economics courses. Changes within the current curriculum can be made to accommodate this. Micro and macroeconomics can be incorporated into the core and can serve as prerequisites of Environmental Economics. This would allow the Environmental Economics course to focus more exclusively on the intersection of economic policy and environmental issues rather than having to cover basic macroeconomic principles. Courses from the Economic Development major can additionally be incorporated into the core. The Public policy course can be moved to the core from the community/urban development concentration. Courses that are not a part of the current curriculum but are offered by other departments can also be included, such as business, managerial, and economic development courses.

*See [http://www.ithaca.edu/sli/](http://www.ithaca.edu/sli/)

ii. Community & Urban Development (CUD) Concentration

Students within the community/urban development concentration rated Environment Issues & Sustainable Solutions, Ecology & Sustainability, and Harrisburg Neighborhoods as the courses that provided them with the most knowledge concerning sustainability. Courses that were most beneficial in providing skills included Harrisburg Neighborhoods, GIS, and field work such as internships or practicums. 5 of the 8 CUD respondents either agreed or strongly agreed that overall, they were satisfied with the content and structure of the concentration. 5 of the 8 also agreed with the statement that the concentration provided them with the knowledge, skills, and experience to successfully engage in the field of community/urban development. These numbers indicate that this concentration provides a moderate foundation for community and urban development but that there is definite room for improvement.

One weakness that several respondents mentioned was the lack of skills the major provided them (CUD 14:5, 15:4, Grad 7:1): “I feel I have a good grasp of each of the components of sustainability. However, I don’t feel like I have the necessary skills to engage any of them in a very competent manner”. One way this weakness can be addressed is through the addition of upper level, issue specific courses. 7 of 8 respondents either agreed or strongly agreed that more upper-level, issue specific courses should be incorporated into the concentration. Recommendations included community development, urban planning/design, and sustainable housing/architecture courses. One specific recommendation that three respondents (CUD 15:4, Grad 14:1, 14:3) mentioned is incorporating courses on non-profits into the curriculum. Grant writing should be included in the curriculum as this is essential to working with non-
profit organizations and would help to fill the “skills gap”. Two students in discussion group B brought up this point, articulating their desire for courses focusing on non-profits. These recommendations carry further weight when considering that community/urban development often depends on collaborating with non-profit organizations.

Specific recommendation that were mentioned in surveys and affirmed in discussion group B was creating a series of options in the curriculum where students could gain experience in an urban setting including: SALT House, urban studies programs, and development focused study abroad options (Rwanda, Thailand).

See the appendix for an example of an “Introduction to Community Development” course syllabus, a class I took that is offered through Temple University. This course was crucial to my understanding of community development components and asset-based development. This is an example of a course that would greatly benefit the CUD concentration.

iii. Sustainable Agriculture Concentration

Students within the agriculture concentration rated Environmental Issues & Sustainable Solutions, Ecology & Sustainability, and Environmental Ethics as the most beneficial courses in providing knowledge of sustainability. Courses most beneficial in providing skills included Plant Propagation, Environmental Issues & Sustainable Solutions, and practicums.

A common theme among the surveyors was that the study of agricultural systems is ineffectively covered in the curriculum: “very few of the courses had direct application to agricultural systems” (AG 14:1). Students further noted that there was a heavy emphasis on the environmental and plant sciences without adequate inclusion of agriculture curriculum. Courses focusing on plant science “are excessive” (CUD 12:1) and the concentration overall is too focused on environmental sciences (AG 14:2, Grad 6:4). Another student affirmed this in stating that courses are “mostly focused on plant form and function” (AG9:2). Indeed, there are no courses that explicitly focus on agriculture. As one student put it: “Very few of the courses had any direct application to agriculture systems. Although I have a strong base in ecology and plant biology through these courses… if I did not have any outside experience in farming I would be completely unemployable upon graduation” (AG 14:1).

Surely, the present courses are important to the concentration because having a foundational knowledge of the environmental and plant sciences is critical to engaging in agriculture. Yet this knowledge needs to be supplemented with courses that develop knowledge and skills specifically in agriculture. While practicums and internships do give students hands-on experience with agriculture, they would greatly benefit from having agriculture-focused courses. So while the concentration provides students with a strong foundation in environmental and plant science, a notable strength, students desire agriculture courses that build upon this foundation.

Another notable weakness is the lack of skills the courses provided related to agriculture. Two out of three respondents disagreed with the statement that the agriculture concentration provided them with the knowledge, skills, and experience to successfully engage in the field of sustainable agriculture. The
only graduate of this concentration stated that the agriculture track contains great courses, but “more depth is needed for students seriously interested in agriculture” (Grad 17:1). This graduate also mentioned that he took more chemistry and plant science than required yet graduated wishing he had more skills necessary for a career in sustainable agriculture (Grad 6:4, 17:1). Students also mentioned their desire for courses that focus on the economic and social side of agriculture systems (Ag 10:2, Grad 6:4).

The lack of hard agriculture skills and experience with the economic/social side of agriculture can be addressed in a variety of ways. The Grantham Community Garden is a significant asset that should be incorporated into the concentration to provide students with basic agriculture skills and experience. Incorporation into the curriculum can take several different approaches. Students could be required a certain number of work hours per week, an approach that was endorsed at both focus-group discussions. Discussion group A also suggested that students be mandated to serve as managers of the Community Garden. The GCG could also create research internships. For example, garden research intern positions can be created where students research specific topics (i.e. IPM, runoff, biointensive agriculture, permaculture) and create a project management plan for implementing the proposal at the Grantham Community Garden. Not only would this improve the productivity of the garden, but more importantly, these research projects would enable students to put their knowledge and skills into practice in a real world setting.

iv. Sustainable Public Policy Concentration

There were no junior, senior or graduate students within this concentration at the time the surveys were conducted.

B. Developing Skills

The theme of hands-on, project-based learning that develops specific skills was the most prominent theme in the student surveys and focus groups. Below are notable student remarks concerning this topic:

• “I have built for myself a solid foundation of sustainability theory, yet have been left without any adequate skills to build any sort of structure around this foundation” (Grad 9:4).
• “Many courses were great but lack practicality. I know plenty of aspects about underserved urban communities but lack the experience to do anything about it” (Grad 5:2).
• “I feel like I have a good general grasp of each of the basic functions of all three components of sustainability. However I don’t necessarily feel like I have the practical skills to engage any of them in a very competent manner” (Grad 7:1).
• I have the most knowledge of social sciences concepts but I don’t feel I have the skills to engage with these concepts. I do not feel that I know of the necessary tools to properly engage with these problem and how to use those tools (CUD 6:5).
• Though the Sustainability Studies major, completed as required, leaves students well-rounded but lacking in skills or depth of understanding necessary to make a real SUSTAINABLE difference in the world (Grad 7:4)
The discussion of skill development will be centered around student recommendations for on and off campus projects as well as research I conducted on experiential/project-based learning.

i. **On-Campus Projects & Collaborations**

Through the surveys and focus groups, students suggested specific ways in which the sustainability major could partner with the campus community to enhance the education of sustainability studies. A common theme mentioned by both current students and graduates was involvement in on-campus sustainability-focused projects (AG 18:1, CUD 17:2,3,4). Students state that: “there needs to be more applied projects” (AG 18:1); “it is essential for the major to partner with sustainability projects on campus (CUD17:2); students should work with on and off campus partners to complete projects (Grad 24:1,3,4, CUD 17:3). These hands-on projects and collaborations are critical to developing experience and professional competency. As one graduate put it: “connections between already established departments, clubs, or offices means that students would be meeting, listening, talking, planning… with people who have been invested in those programs for years. This is insight that will help a student develop and be ready for real-world situations” (Grad 24:3).

Hand-in-hand with the above mentioned projects are the importance of experiential learning opportunities noted by respondents. The three community & urban development graduates provided particularly insightful comments: “more practicum experiences, internships, study abroad, and service activities should be incorporated… these real world emersions are the way I believe that skills and experience are fully gained” (Grad 7:1). One grad stated that his experiences outside the classroom were most beneficial to successful engagement in the field (Grad 13:2), a sentiment that was echoed by a current student: “I learned the most from experiences not prescribed to me” (CUD 16:3). The city of Harrisburg should also be incorporated more into student’s experiences, particularly for the community & urban development concentration: “this concentration should use Harrisburg as a jump-off for understanding how urban communities work” (Grad 15:1). Current students also stressed experiential learning opportunities and emphasized the importance of internships and study abroad opportunities.

During each of the focus group sessions, participants were most enthusiastic about gaining experience through implementing on-campus projects. This can be accomplished through a semester long project as a part of the capstone course. Focus group A discussed implementing a “Sustainability Project Bank” where campus departments, facilities, and local community organizations submit project proposals to the Office of Sustainability and are addressed by students through the capstone or semester long internships. As one participant of the focus group noted, this type of application would “bridge the gap” between theory we learn in the classroom and the practical application of that theory.

Students also recommended collaborating with other on-campus entities: “[Sustainability] majors should be able to work with engineers, business majors, etc. to design solutions to problems faced on campus” (AG 18:1). This sentiment was echoed by two other students. One suggested that the major...
continue to expand its partnership with the Public Relations and Business departments in accomplishing its [project] goals on campus (CUD 17:1) and to work alongside the Investment Club and Business departments to collaborate on campus projects (CUD 17:4).

ii. **Project-Based Learning**

Research shows that this type of learning, called experiential learning or problem/project-based learning, is particularly relevant to sustainability pedagogy and curriculum. Sustainability science has been described as “neither basic nor applied, but rather problem-inspired inquiry that serves the quest for advancing both useful knowledge and informed action” (Clark, 2007). Therefore, our learning needs to provide us with experiences where we encounter real problems and take action. In the surveys I conducted, incorporating experiential learning into the major was a recommendation that came up again and again. One graduate eloquently noted that: “Sometimes it felt like I was just doing the courses, not living the program as richly as it should have been lived, especially being so close to a city where ideas with a sustainable lens are ever more desirable” (Grad 23:2). Experiential learning would propel students beyond classroom theory, enabling them to “live” out the principles of the sustainability field.

Dr. Jay Roberts, Director of the Center for Integrated Learning at Earlham University, provides insight into two experiential learning methods in his article *Experiencing Sustainability*. The first is place-based learning which draws from the theory of bioregionalism; asking the question, ‘What can we learn from engaging with the local and regional place?’ Place-based learning prevents students from falling into the trap of simply caring about issues like poverty, pollution and racism. By developing a knowledge and intimacy with their surroundings that is more than skin-deep, students are able to care for those in poverty, the species suffering from pollution, and the victims of racism. As Roberts writes: “Repairing the severed bonds between the human and the more than human world is the root core of a sustainability ethic. Place-based learning is one approach, of many, that works to stitch back together what has been torn apart”. Courses which emphasize place-based learning include Harrisburg Neighborhoods, Plant Ecology, Environmental Issues & Sustainable Solutions, and the capstone course.

Robert’s second experiential learning method is project-based learning. Here, curriculum is designed around real world problems, either on or off campus. The “academic” world and the “work” world should not be two separate spheres, but one and the same. Our students have demonstrated that they have a working knowledge about sustainability and issues related to it, but what we need are more opportunities to learn through engaging sustainability. Roberts emphasizes this importance of learning by experiencing sustainability: “place-based and project-based learning present exciting synergies between experiential education and education for sustainability with their active, collaborative, and practical orientation”.

Experiential learning is one remedy to compensate for the lack of skills provided by the major. Several respondents include project and place-based learning recommendations and how experiential learning benefited them:

- “I would suggest that practicum experiences, internships, study abroad, and service activities are more incorporated into the major - these real world emersions are the way that I believe skills and experience are fully gained” (Grad 7:1).
- “This lack of practical knowledge [in the sustainable agriculture concentration] can be easily mediated by have two (or more) internships” (AG 14:1)
• “There needs to be more applied projects. Majors should be able to work with engineers, business admin majors etc. to design solutions to problems faced on campus” (AG 18:1)
• “Working on a semester long plan doing one of the first audits of the college's sustainability...actions was helpful in my development as professional outside of school” (Grad Q3:2)
• Interning at the Grantham Community Garden and leading weekly service-learning teams was cited by one student as the most beneficial experience to providing skills for enhancing societal sustainability” (AG 5:1)
• “Doing a practicum with development organizations in Thailand gave me the best tools for real-world sustainability applications” (CUD 5:3)
• “The [Harrisburg Neighborhoods] field work...helped me to understand what urban sustainable development actually looks like” (CUD 5:3)
• “Hands-on work should be incorporated as a requirement beyond a single practicum/internship” (CUD 10:2)
• “More courses like Harrisburg Neighborhoods [should be incorporated into the CUD concentration] that provide active learning in a community” (CUD 15:4)
• Internships were mentioned by numerous students as being the most beneficial experience (CUD Q16)

So how can we imbed the experiential learning method more deeply into the curriculum? Before this question is answered, it is necessary to recognize the ways in which experiential learning is already present in the curriculum. As indicated by the student surveys; internships, practicums, service activities, and the Harrisburg Neighborhoods course embody experiential learning techniques and are particularly beneficial to providing students with practical skills in their discipline. But it is imperative that we take advantage of the micro-environment that is our campus. As students at a relatively small institution committed to sustainability, we have unique opportunities to implement place-based and project-based learning methods. On campus, significant progress has already been made in the creation of the Office of Sustainability which enables students to serve as interns with projects such as the Sunflower project, the Grantham Community Garden, the Real Food Challenge, a GHG inventory, and composting and waste-diversion projects.

Yet more project-based learning opportunities are needed in the curriculum. It should be noted that a majority of the major’s required courses do incorporate individual or group projects into the coursework. While these research projects are beneficial, they are but a small component of the course content. Integrating more rigorous, semester-long projects into the curriculum would be more beneficial. For example, the senior capstone class could be solely focused on implementing a semester-long project, an idea recommended by several students (Focus groups A,B; CUD 17:5). The “project bank” and collaboration with on-campus groups and majors as discussed in section V also applies here.

Furthermore, though on-campus projects do provide students with critical hands-on experience, off-campus projects done in collaboration with external entities are even more valuable. These types of projects provide students with the resources and guidance to implement solutions in the real world, outside the controlled environment of campus.

Above, I discussed implementing a sustainability-focused project through the senior capstone course. This is an easy way to integrate experiential learning into the current curriculum. Indeed, many institutions are using their capstone courses solely for student projects, including several of Messiah’s benchmark and competitor institutions. Both Elon University and Eastern Mennonite University’s senior
A seminar/capstone requires a semester-long student project that partners with community organizations. Bucknell University’s capstone features a community-based “clinic” where students work on local environmental problems/projects.

Though not one of Messiah’s benchmark or competitor institutions, UNC Chapel Hill also features a project-based capstone. Elizabeth Shay, coordinator of the environmental studies capstone, wrote an article discussing sustainability capstones and the importance of projects to enhance learning. UNC’s capstone course is designed as a bridge from the academic world to the work world. Students are divided into a 5-10 member team involved with data collection and analysis, project management, problem solving, institutional processes, and collaboration with instructors, peers, and clients. Shay writes of the skills acquired through this type of course ranging from “interview instrument development and content analysis, to video editing, to GIS-assisted inventories (e.g., LED street lights or bicycle infrastructure), GPS-supported surveys using hand-held computers and logs, and sketch and design products (e.g., storm-water management best practices) (Shay 2013)”. Reports from UNC students and clients demonstrate the value of project-based sustainability capstone courses: “These projects build a body of data-driven and policy-relevant products for clients, while exposing undergraduate students to practical collaborative problem-solving and research development experience (Shay, 2013).

iii. NSCE Skills Analysis

a. Collaborative Engagement

The Collaborative Engagement component accounted for 32% of the explained variance in the ratings. I therefore analyzed the top five categories instead of the top three as with the other skills categories. The top five sub-skills, from greatest importance to least include: advocacy/outreach, cultural competence, interdisciplinary/intercultural communication, community engagement, and organizational learning/development. Harrisburg Neighborhoods, a core requirement, is particularly relevant in developing collaborative engagement skills as this it addresses three of the five sub-skills. Though the sub-skill deemed most important, advocacy and outreach, is not addressed. It should also be noted that aside from the Harrisburg Neighborhoods course, there are no other courses in the agriculture tract that address collaborative engagement.

The value of collaborative engagement was emphasized through student surveys. Numerous students stated that engagement opportunities such as studying abroad, internship, and volunteering were some of their most valuable experiences. Implementing a program like the “Project Bank” as described in section B would provide students with skills in collaborative engagement as they collaborate with multiple entities. Another tool to build the skill of collaborative engagement is service-learning. Through these hands-on experiences, students learn community engagement, cultural competency, and organizational learning/development not just through theory, but through hands-on action. While students in the focus groups agreed that it shouldn’t be mandated, service-learning should certainly be highly encouraged by faculty advisors and perhaps incorporated into courses as alternative assignments (as is the case in Jenell Williams-Paris’ Cultural Anthropology course).

Several of our benchmark and competitor institutions are already incorporating collaborative engagement experiences, beyond internships, into their curriculum. Elon University’s environmental
studies major’s capstone features a community-based project as well as a Peace Corp Prep program where students engage in service with external organizations. Bucknell University also focuses on community collaboration through their Environmental Studies major senior clinic where student work on a semester long community-based project. Eastern Mennonite University also features a community-based practicum where students from each concentration work together to implement a project with local organizations.

Messiah College has a plethora of resources students can take advantage of to enhance their collaborative engagement skills. For instance, internships with the Office of Sustainability feature elements of collaborative engagement through partnering with campus departments (i.e. Facilities & Grounds, Dining Services, etc.). The Internship Center has a variety of internship opportunities where students can gain hands-on experience with collaborative engagement. Internships that include advocacy/outreach should be emphasized by advisors as the curriculum does not include this component. In addition, the Agape Center has countless service opportunities where students can develop skills in outreach, community engagement, cultural competence, and interdisciplinary/intercultural communication. It is imperative that advisors encourage sustainability students to take advantage of these opportunities in order to advance their collaborative engagement skills.

Students would further benefit from knowledge of and experience with corporate, government, and non-governmental entities. Because sustainability is based on a systems model that encompasses numerous disciplines, knowing how to work with these entities is crucial for sustainability professionals. For example, in a survey of 791 sustainability professionals, GlobeScan / SustainAbility found that businesses regularly collaborate with NGOs, industry, government, professional services, media, and academic institutions to advance sustainable development goals (BSR/GlobeScan, 2013). Providing more structured opportunities in the curriculum for advocacy, outreach, community engagement, and intercultural/interdisciplinary competence would be a worthwhile goal, especially considering that one experience could include all of these components.

b. Informatics

As an academic field, informatics involves the practice of information processing and creating systems for information storage. The NCSE survey found that the top three sub-skills correlating the most with informatics were, from greatest importance to least: computer programming/modeling, decision science, and spatial analysis/remote sensing. Decision science and spatial analysis/remote sensing are both addressed in the curriculum, though minimally. The sub-skill of computer programming/modeling is not addressed through the curriculum.

Isaac Smith, a 2012 community development graduate, specifically addressed the topic of informatics in his survey response. Since graduation, Isaac has conducted a waste audit for a large corporation and is currently working with a non-profit organization on business and community sustainability programming. He therefore has a knowledge of the tools and skills required in this sector of the sustainability field. Isaac writes that:

Working in the sustainability field of Pittsburgh, I have been exposed to a lot of people from CEO to staff in all sectors of sustainability, giving me a solid understanding of skill people who are in higher positions possess...I would have liked to have access to and experience more of the programs used to track, manage and develop goals around sustainability. Examples being Portfolio Manager, LEED, GIS, EPA WARM, Urban planning software, etc. I would have liked the
option of taking specific industry level courses... classes that are more geared toward professional development with the ability to get certified in something (a.k.a. LEED, etc.). We need to be providing our students with an edge over everyone else and equipping them with more applicable skills they can bring to the workforce (Grad Q7:2).

Isaac emphasizes the point that students need to be prepared with an informatics-based skill set. This is particularly relevant for the field of energy management which is a growing concern that sustainability professionals will be hired to address. For example, in GreenBiz’s 2013 State of the Profession report the percent of companies with an energy manager role rose to 52% in 2012 (GreenBiz Group, pg. 15, 2013). Furthermore, GHG and energy reduction were the top two topics shareholders and investors were asking companies about (GreenBiz Group, pg. 20, 2013). Working on an energy management project requires informatics skills, particularly with computer modeling/software programs such as Portfolio Manager and EPA WARM that Isaac mentioned. As companies realize the necessity of creating a sustainability reporting system, we as future sustainability professionals, need to be prepared at least with a basic knowledge of how to track, report, and evaluate these projects.

Sustainability informatics is necessary to develop sustainable solutions. It is a growing sector that incorporates the traditional environmental informatics with social, geo and bio-informatics and information systems. As one expert explains:

Sustainable Informatics is a subfield of Applied Informatics. It contains research and development of those methods, models, hardware, and software systems, which contribute to the goals of Sustainable Development. This includes the analysis and forecast of observed phenomena of the natural and social environment. It includes also the design of hardware, software, and information systems which supports Sustainable Development (Naumann, 2008).

Elizabeth Shay, the previously mentioned UNC Professor, affirms this trend towards developing informatics-based skills:

The realm of sustainability education would benefit from more discussion of tools that could form a core skill set in which to train sustainability majors; these might include GIS and remote sensing, bio- and earth informatics, survey design and qualitative analysis, carbon accounting and emissions reduction, theories of political and cultural change, communications, and water and air quality analysis...”

Elizabeth Shay, UNC Professor
To prepare our students for successful engagement in the professional workplace, we must incorporate elements of informatics that allow for at least a minimal level of literacy. Certainly, our students do not need to be experts in computer programming or GHG tracking software. But having a basic knowledge of the tools used by sustainability professions is critical to developing a comprehensive knowledge of the field. A course that included a tutorial on carbon accounting and emissions reduction software would be beneficial as it would allow students to “speak” the language of sustainability professionals and for certain students, can serve as a springboard for future work in that area.

c. Project Management

The NCSE report found that the three most important project management sub-skills were basic project management skills such as logistics and budgeting, assessment & reporting, and planning & reporting. Currently, the curriculum does not contain courses that address these skills. Yet project management proves to be a skill required by sustainability professionals. The International Society of Sustainability Professionals Competency report found that project management was among the top three hard skills required for sustainability professionals with 67% rating it as “of extremely high importance”(Willard et al, pg. 23-4, 2010). This is logical considering the rise in the number of businesses and organizations pursuing sustainability focused projects. This is evident right here at Messiah College where we are undertaking projects like the Biodiesel project, GHG Emissions Inventory, the Grantham Community Garden, Food Waste Recovery, Composting, and the Real Food Challenge, among others.

Formal ‘Sustainability Director’ positions are increasing at a fast pace. The Association for the Advancement of Sustainability in Higher Education (ASSHE) conducted a 2012 survey of higher education sustainability staff and found that “nearly half of all 2012 respondents were in positions created or upgraded since 2010, indicating significant growth for sustainability positions in the last two years” (Urbanski & Walton, 2013). As students who may potentially be fulfilling these roles, it is critical that we are prepared with project management skills such as budgeting, planning, reporting, and assessing.

To best utilize these hard skills, it is also beneficial to have a background in the business or managerial systems that they are a part of. Students expressed this in stating that:

- “The reality of implementing sustainability in our society is that we need to make it marketable and profitable” (CUD 10:4).
- “I would have liked to have access to... a class that teaches budgeting for projects, returns on investments, cost benefit analysis and such. Any sustainability project has to be approved and often requires a ROI and benefits (Grad 7:2).
- “There seems to be a gap in our business/ engineering type concepts that could be a vital part in our understanding of sustainability” (AG 10:1).
- Business and managerial courses would also develop the professional skills that one graduate perceived to be lacking in the curriculum (Grad 22:2).

We can incorporate these skills into the curriculum by adding select business, human resource management and/or management classes. In the surveys, several students expressed their desire for business-oriented classes including marketing (AG 15:2), business (CUD 10:4), environmental management (Grad 10:2), and organizational management (Grad 10:3). These business skills would not only serve
students well in project management, but would also partially fill the skills gap described in section B.

In creating the Certificate for Professional Sustainability Leadership, Ithaca College’s Sustainability Director recognized that many sustainability directors are “jacks of all trades, masters of none”. Through this program, students can gain skills in applying sustainability principles to project management and businesses. Seminars within the certification program address many of the above concerns voiced in the student surveys, notably business, economic, and managerial skills.

Jane Allen Jones, Founder and Principal of Sustainability Management Consulting LLC, speaks further to project management in the sustainability profession:

Sustainability professionals are known for being innovators, for finding new approaches to the familiar and for creating new products for the marketplace. But all the good ideas and strategies in the world will not do anyone any good unless they can be implemented successfully. This is where the rubber meets the road for sustainability – getting things done. Sound project management skills and techniques are a key element in ensuring sustainability project success. Converting the great ideas into action and results are sometimes where sustainability efforts sputter and die. Succeeding in the implementation of great ideas requires great project management and knowledge. Therefore, spending time and effort to learn these skills will greatly enhance your success as a sustainability professional (Jones, 2012).

Jones’ report found that the some of the most important soft skills include the ability to influence an organization to get things done, leadership and motivational capabilities, and organizational skills. The ability to inspire and motivate others was rated by 75% of survey respondents as “of extremely high importance” (Willard et.al, 2010). Human resource management courses such as HRM 312/LEAD 312 “Leading Organizational Change” and LEAD 310 “Leadership Theory and Development” could adequately address this skill. Establishing an “Eco-Rep” program would give students hands-on experience with project management. Eco-Rep programs* are peer-to-peer sustainability outreach programs that are being implemented on numerous campuses including Messiah’s benchmark/competitor institutions such as Calvin College, Houghton College, Luther College, Dickinson College, Elon University, and Ithaca College. Implementing an Eco-Reps program through the Office of Sustainability and Residence Life would create an additional opportunity for our students to practice project management skills such as leadership, organizational management, collaborative engagement and motivational strategies.

While the major’s courses do not explicitly address project management, internships and practicums provide opportunities to practice this skill. One graduate noted that his practicum with the Office of Sustainability “provided great experience in project management, goal setting, communications and presenting” (Grad 5:2). Though I did not take the practicum course, I participated in an internship with the Office of Sustainability and the Real Food Challenge. As the head intern for our 3 member team, this experience provided me with valuable project and personnel management skills such as coordinating a team, planning project activities, applying deadlines, and communicating between various parties. The importance of engaging in project management through internships, practicums and capstone projects cannot be understated. Students should therefore be encouraged by their faculty advisers to go beyond the minimal course requirements and take several internships or related experiences.

*For additional information: [http://www.aashe.org/resources/peer-peer-sustainability-outreach-campaigns](http://www.aashe.org/resources/peer-peer-sustainability-outreach-campaigns)

d. Systems Thinking
Systems Thinking “focuses on how the one thing being studied interacts with the other constituents of the system of which it is a part (Aronson, 1996)” . This means that rather breaking down the system into its constituent parts, systems thinking works by expanding the view to include the comprehensive interactions of the whole.

The ISSP 2010 report found that systems thinking was among the top three hard skills deemed most important for sustainability professionals (Willard et.al, pg. 24, 2010). Intuitively, this makes sense because sustainability is an interdisciplinary field. Graduate students at the University of Vermont conducted a study entitled “Understanding, Teaching, and Influencing Campus Sustainability from a Systems Perspective”, concluding that systems thinking helps students to see relationships, understand system behavior, and helps students be more effective agents of change (Posner & Mika, 2011).

The structure of Messiah’s current curriculum does a good job of encouraging systems thinking by incorporating courses from a variety of disciplines (i.e. biology, politics, economics, social work, sociology/anthropology, GIS, government). As far as specific systems thinking sub-skills, the NCSE report found that the most important sub skills were synthesis, problem-solving, and analysis. Again, the curriculum covers these skills quite well as 2 core courses cover all three sub-skills. Several CUD and PP required courses address these skills, though it should be noted that the agriculture concentration is lacking in such courses.

In examining the strengths of the current curriculum, one graduate highlighted the importance of the practicum course in enhancing the skill of systems thinking: “The practicum for the Sustainability office provided great experience in...working with all sides of campus operations and staff. [It] was a great growing experience, all while seeing how these different operations function as a whole” (Grad 5:2). One way to enhance the development of systems thinking in the curriculum is to incorporate more social science courses into the core and/or the sustainable agriculture curriculum. This recommendation was specifically cited by an agriculture student in Focus Group A who noted the lack of courses that addressed the social aspect of sustainability in the agriculture concentration.

e. Personnel Management

With project management skills comes the necessity for personnel management skills. Team building and collaborating was ranked by 73% of surveyors as a soft skill of extremely high importance for sustainability professionals (Willard et.al, 2010). Negotiation and conflict management, leadership, and motivational strategies are vital tools to ensuring a successful project outcome (Jones, 2012).

The top three most important personnel management skills were basic personnel management skills such as recruitment, training, tasking and evaluating; project management (budgeting, logistics), and media communication. Two sub-skills were not covered through the curriculum (personnel management, project management), while one core course addresses the sub-skill of media communication. The gap in both personnel and project management skills can be addressed in similar ways. Incorporating human resource management and leadership courses into the curriculum, as discussed above, is one way students can gain knowledge in personnel management. The EcoReps program is also a viable way to enhance personnel management skills. Additionally, students should take the initiative to step into leadership and team management roles through volunteer opportunities,
extra-curricular activities, and internships. Faculty advisers should emphasize to sustainability students the importance of taking this initiative.

f. Technical Communication

The 2010 International Society of Sustainability Professionals report found that sustainability professionals ranked communication as the top soft skill for success in their field (Willard et. al, 2010). Within the field of communication, the NCSE study found that the top three communication skills were academic/technical writing, oral communication, and information literacy.

Numerous courses covered academic/technical writing through lab and research reports. In fact, this sub-skill had the most course listings of any other sub-skill, including core courses and several courses from each concentration. Going hand-in-hand with academic/technical writing is the sub-skill of information literacy. This sub-skill is naturally incorporated into academic/technical writing through student’s research papers and presentations. Again, courses that cover information literacy could be found in the core and in each concentration. Oral communication was also sufficiently covered through current courses that require oral presentations. General education courses also bolster this skill as the majority include oral presentation components. Therefore, the skill of technical communication proves to be adequately covered by the current curriculum and is a significant strength of the major’s structure.

With this conclusion, it should additionally be noted that communicating with internal and external stakeholders and influencing change within and outside the organization were considered the most important soft skills for sustainability professionals (Willard et. al, 2010). This means that our students should be given opportunities to communicate with professionals and key stakeholders and to practice persuasive communication. Indeed, one such opportunity is provided through the Environmental Issues & Sustainable Solutions course via the “Green Innovation Summit” where students present project proposals to campus leaders. On-campus internships, specifically through the Office of Sustainability, and off-campus internships can also offer such opportunities.

g. Lab/Field Research

The NCSE report found that the most important skills in laboratory and field research were basic laboratory research skills, followed by basic field research skills. Components of these skills include lab techniques and practices, instrumentation, and data collection.

A significant strength of the Ecology and Sustainability core course is that it addresses both lab and field research. And while the agriculture concentration may fail to address several other skills, it is rich in both lab and field research. Harrisburg Neighborhoods remains a significant asset in its focus on community & urban field research. Student responses indicate that Harrisburg Neighborhoods provides valuable skills in conducting urban field research (Grad 5:3), a skill that is fundamental to working in community development. Incorporating more courses that focus on community analysis research would be highly beneficial to the CUD concentration and would give our students more of the desired hard skills.

V. Conclusions
Students demonstrated that the core provides a foundational knowledge of sustainability. By incorporating courses from various disciplines, the core encourages the skill of systems thinking and gives students a breadth of knowledge that traditional, mono-disciplinary majors lack. Weaknesses of the core include the repetitive, surface level nature of sustainability material and feelings of incompetence in economics. Recommendations to core courses included managerial, business, and economic courses with a particular emphasis on developing skills.

Because the majority of students in both concentrations desire more upper level, issue-specific courses, each concentration would benefit from courses that explicitly focus on development (i.e. community planning, urban design, principles of community development) or agriculture (pest/weed management, soil science, agribusiness) respectively. The sustainability studies major has not been able to accommodate these courses because of the newness of the major and the fact that its courses come from other disciplines. As the major grows and students continue to demand more upper level, issue-specific courses- addressing this issue will become that much more urgent.

The NSCE report can help us in addressing the other major theme articulated in the surveys which is the lack of skills. Perhaps the two most important skills are informatics – where students could develop hard skills in reporting, monitoring, and evaluating; and project management, where students can engage in projects that also develop personnel management, communication, and collaborative engagement skills. Again, students highly recommended including more experiential learning options that can be implemented through the capstone, a “project bank”, and additional internships or practicums.

VI. Areas for Future Research

It must be recognized that the student surveys and focus groups only represented a portion of the population and failed to capture every student’s experience within the major. Subsequent research that hopes to capture the full effect of the major should aim to include every student’s evaluation. This research would also benefit from analyzing the enrollment trends and growth in the major. This would provide incentive for administration to refine the major and justify the incorporation of issue-specific, upper-level courses and the hiring of additional faculty.
VII. Appendix

CDEV 1113: Introduction to Community Development
Spring 2014: Tuesday and Thursday, 3:30 PM – 4:50 PM
Tuttleman Learning Center 307AB

Instructor: Melissa Kim, melissa.kim@temple.edu, 267.679.6306

Overview
This course introduces community development concepts and practice. Community development refers to the broad set of skills and institutions that local communities utilize in an effort to improve the quality of life for all residents. Students will learn about the social, political, economic, historic, and cultural dynamics shaping various types of communities and the various ways, through organizing and capacity building, that community development professionals and activists have sought to improve these conditions. Through discussions, activities and assignments, students will apply the knowledge, skills and abilities needed to work in the field.

Required Text

Objectives
Upon successful completion of this course, participants will:

- Understand key concepts relating to community development as a field of study and as practice
- Be able to think critically about the substantive issues in community development, such as housing, economic development, education, community-based organizations, food systems, and sustainability
- Understand and be able to apply the basic elements of a community development process to encourage participation and decision-making informed by multiple perspectives and sources of information
- Be able to recognize, use, and evaluate community development strategies, tools and resources
- Understand how issues of age, race, class and gender permeate the issues within the field of community development

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|       |      | The Community Development Process | Chapter 4 |
| 7     | 2/11 | The Community Development Process | Chapter 4  
| 8     | 2/13 | SNOW DAY |          |
| 9     | 2/18 | Community Organizing | Video: The Democratic Promise: Saul Alinsky and His Legacy. |
|       |      | The Role of Community-Based Organizations | Chapter 5  
<p>|       |      | Assignment 1 Due |          |
| 10    | 2/20 | Human Capital | Chapter 6 |
|       |      | Current Issues – 2 |          |
| 11    | 2/25 | Social Capital | Chapter 7 |</p>
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Student Survey Citations

(Grad 5:2)- Refers to “All Graduates” report, question 5, response 2
(CUD 7:4)- Refers to “Junior/Senior Community & Urban Development” report, question 7, response 4
(AG 6:1)- Refers to “Junior/Senior Agriculture” report, question 6, response 1

Works Cited


