Sustainability Internship Programs: Strategies for Creating Student Ambassadors for Sustainability

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Abstract

The purpose of this paper is to explore the strategies and an effective model for creating and implementing a sustainability internship program at a university campus. The sustainability internship program we created at Western Michigan University is guided by five learning outcomes underlying basic sustainability competencies, which are fostered through weekly hands-on experiences, meaningful reflection, and facilitated discussions. This internship model has proved to effectively address learning outcomes as measured by regular assessments for qualitative and quantitative data. Each semester students are given pre- and post-assessments based on these proficiencies, providing us with cumulative data, qualitative feedback, and anecdotal evidence relating to the efficacy of our internship program over the past five years. This resulting information has helped determine our trajectory to equip student leaders in collaboratively addressing sustainability challenges. This research has propelled our progress as a higher education institution and set a precedent for programs that effectively cross both academic and sociocultural boundaries in sustainability work.

This study assessed interns’ gain of content knowledge in sustainability topics via pre-and-post assessments. A sample of 50 Wesustain interns between Fall 2016 to Spring 2019 comprising 6 cohorts participated in this study. Data were analyzed using SPSS to calculate descriptive statistics and sign tests. As a result, the total mean score of the interns’ pre-assessment for all 14 subjects tested was 7.41 (24); post-assessment score was 11.82 (24). The averaged normalized gain score is 4.41. Based on the result, the sustainability internship program content and model has been proven to be effective in increasing students’ gain of knowledge in sustainability issues and further creating sustainability ambassadors on campus. We believe that other institutions and sustainability offices should consider creating their own sustainability internship program and the use of pre-and post-assessment as a useful method of evaluation.

Key words: Internship, sustainability education, pre-and post-assessment, experiential learning, evidence-based program

1. Introduction

1.1. Background

The beauty of an internship is that it is a unique experience that serve different purposes for different students. Internships play an important role in preparing students to critically engage with the social world, especially with gaining experience doing first-hand skill development and knowledge not normally obtained in a regular classroom (Sahrir, M., Ismail, T., Mustapha, N., Baker, R., Man, S., Ahmad M., & Mohktar, M, 2016). For this reason, many academic institutions and universities offer various internships that can help students gain the

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necessary soft skills (de Ridder J, Meysman P, Oluwagbemi O, Abeel, T, 2014) and leadership skills that are highly needed in their workplace after the graduation (Association of American Colleges & Universities, [AAPU], 2007). It is common for employers in the job market to require prior experience to qualify for entry-level professions, and the majority of employers feel that recent college graduates are not prepared for their future occupations in areas such as critical thinking skills, written and oral communication skills, and working as a team (AAPU, 2007). In today’s changing world and uncertain future, students need internships that not only prepare them for their future occupations, but that can enhance their sustainability knowledge, leadership skills, critical thinking and advocacy in their college campuses.

Unlike many traditional internships, Western Michigan University’s (WMU) Office for Sustainability’s internship aims to create sustainability ambassadors who apply their knowledge immediately on campus and in later in their professional and personal lives. Why do we need sustainability ambassadors at university campuses? Because the consumption habits and lifestyles of more than 19.9 million college students (National Center for Educational Statistic, [NCES], 2019) are being shaped in our nation’s academic institutions, and most of them are not being educated or encouraged to evaluate the impacts of their consumption and lifestyle choices on themselves, others, or the future. In the United States 5,300 universities and colleges—as generators of knowledge, innovation, and expectations—serve as innovators and creators of the future (Western Michigan University [WMU], 2009). As several eminent threats to the state of planet grows, our responsibility as global citizens to combat correspondingly climate change increases. Society is likely to be challenged by continued—and unprecedented—environmental, political, and social problems this century. The Office for Sustainability seeks to recognize these threats, identify the challenges surrounding them and develop clear paths to actively protect our world from degradation. This effort starts with the aspiration and ambition of our students. To address the urgency of the expanding campus sustainability effort and creating sustainability ambassadors at university wide level, the Office for Sustainability developed an evidence-based internship program that focuses on both leadership skills and sustainability knowledge. The Wesustain Internship Program began development in December 2013, with the first cohort of students beginning the “pilot” phase of the program during the Fall semester of 2014. The Wesustain Internship Program is one of many initiatives by the Office for Sustainability and Western Michigan University to promote a culture of sustainability on campus and in the local community. The internship program was specifically designed to foster student leadership and advocacy for sustainability, both during students’ time at the Western Michigan University and into their future. This study shows that the sustainability internship is an effective way to create opportunities to learn, observe, and practice a variety of experiences in the world of sustainability.

2. Description of the Study Areas and Methodology

2.1.1 Program Development

The development of the sustainability internship program started at the Office for Sustainability at Western Michigan University in December 2013. This process started with two basic aims. First, researching and reviewing best-practice internship programs and models that appeared to have an evidence-based approach and comprehensive programming. Second, searching and synthesizing a literature on the development of learning outcomes and core
competencies in learning for sustainability. Despite the abundance of literature and growing interest in the area of learning for sustainability, there was no consensus (Glasser; Hirsch 2016) and agreement towards what sustainability core competences are. It was even more challenging to find an existing program model that is exemplar and replicable. However, the review of university programs uncovered two promising programs that served as excellent models in the development of our program. Both Portland State University and Indiana University had a large amount of descriptive, easily-accessible information on their websites, and provided information about general start-up and experiential learning. In addition to the best-practice review of existing sustainability internship programs they performed, a review was also conducted to compile the literature surrounding the development of program-specific learning outcomes, both with respect to general education and sustainability-specific education. The utilization of learning outcomes for general education (Association of American Colleges and Universities, 2007; Council for the Advancement of Standards in Higher Education, 2009), as well as in learning for sustainability (Spalding, H., Williams, D. R., & Wise, V. L, 2014), has increasingly gained support in recent years, as a catalyst in the development of attainable education-related goals. By initially identifying learning outcomes to represent goals for learning and experiences gained during the internship program, we could guide programming in reference to achieving those goals and have a concrete objective for assessment. Information from the previously referenced studies focused on learning outcome which was synthesized for key points to guide the development of our own learning outcomes that would reflect the holistic and systems-based nature of unsustainability challenges within a framework of interpersonal, analytic, and applied skills.

The development of learning outcomes and core competencies initiated by Office for Sustainability’s former program staff, Nicolette Ledbury and former director, Dr. Harold Glasser, during a half-day workshop was conducted at the 2013 Association for Advancement of Sustainability in Higher Education (AASHE) national conference. During the workshop, groups of participants engaged in collaborative discussion to develop their own lists of sustainability core competencies and the Office for Sustainability representatives developed competencies that was supported by Wiek (2011). These data that came out of the workshop were used in the development of learning outcomes for the internship program. The former coordinators and staff members of the Office for Sustainability started reviewing publications and research (Sterling, Maxey, & Luna (Eds.), 2013; Wiek, Withycombe, & Redman, 2011) on core competencies in learning for sustainability, and they found that the literature on learning outcomes is often intertwined with the literature on the development of core competencies. The learning outcomes/objectives/goals created for the internship program would be seen as short-term goals on the path toward building a competency (Ledbury, 2015). While there are various cognitive and behavioral psychological models of skill development, competent performance, and expertise (e.g., Bloom, 1985; Dreyfus & Dreyfus, 1980; Ericsson, Krampe, & Tesch-Romer, 1993; Kahneman, 2003, 2011; Klein, 1993) many theories purport that expertise (often characterized by fluency, fluidity, and flow) in a subject matter develops over many years of academic training and in-situ experience; thus, learning outcomes would provide a relevant, measurable step toward the development of a competency (Ledbury, 2016). The guide for those competencies as “a minimal set of complete but relatively non-overlapping competencies that are necessary and well-suited to support the form of transformative system structure changes, which are required to improve the quality of life for everyone (Glasser; Hirsch 2016).

Naturally, an incoming internship student likely has a range of skills and abilities coming into the program that vary across topics. One student might have the capacity (i.e., potential) to achieve a number of targeted goals and have some inherent capabilities given their existing interests and/or academic major. Given that we were seeking to scaffold the existing
skills, behaviors, and attitudes of the cross-disciplinary incoming interns, what would be learned by interns during the three-month program would likely only be a starting point or foundation in the development of core competencies in learning for sustainability now and into the future. It is worth noting that in late 2014, the Association for the Advancement of Sustainability in Higher Education published the Guide to Creating & Managing Sustainability Internship Programs (AASHE, 2014). This manual contains helpful information for schools looking to develop new sustainability-oriented internship programs by outlining specific information on creating (e.g., setting goals and priorities, assessing funding availability) and managing (e.g., developing internship projects, establishing a hiring process, program evaluation) such programs. The AASHE website also features links to supplemental materials (i.e., sample documents and files) to further facilitate program development. This guide was not yet available at the time that the Office for Sustainability was developing their cohort-based program.

Once all of the previously-mentioned literature was reviewed and synthesized, the draft of potential learning outcomes and projections for the program began. In conjunction, the Office for Sustainability staff began to brainstorm how learning outcomes would be reflected in internship activities and experiences, as well as the “assignments” or measures that would be used to accurately reflect the knowledge and skills gained by each intern over the course of the semester. For every learning outcome that was created, we had to find a way for those outcomes to be easily and objectively measured to inform assessment and program efficacy. Once these plans began to solidify and take shape, they were then considered in reference to the University’s statement of official goals (WMU, 2015) and strategic plan (WMU, 2012). We considered this to be a systems-based approach, grounded in our framework of social learning for sustainability, and oriented toward building a broad culture of sustainability on campus and beyond. Once this process was complete, after several drafts and edits to develop the finalized list of learning outcomes to guide the new internship program. The final statement about the program and corresponding learning outcome was as follows:

The goal of the Wesustain Internship Program is to cultivate informed, critical thinkers that serve as ambassadors for sustainability through leadership development and experiential learning. Assignments and activities address sustainability at the individual level. Students will explore topics specific to themselves, the Office for Sustainability, the university as a whole, and the greater global community. The following skills- and knowledge-based learning outcomes are at the core of the program, which will be fostered through regular feedback and assessment.

1) Students will be able to describe and discuss the state of the planet and be able to articulate the consequences of their everyday actions on multiple scales (on themselves, on their communities, and on those distant from them in time and space, including nonhumans). Examples of these forms of knowledge: (a) learn the significance that nature plays in human survival and flourishing; (b) understand how seemingly small actions have profound consequences; (c) question dominant assumptions about the world and society that currently perpetuate unsustainability.

2) Students will develop a deep understanding of the coevolution and interconnectedness of all species and use this knowledge to explore human development opportunities and priorities that promote improvements in quality of life for all (especially the flourishing of nonhumans and endangered cultures).

3) Students will explore leadership strategies, model sustainable behaviors, and experiment with changing their (and potentially other’s) patterns of thinking and behavior.
4) Students will develop an understanding of the organizational goals and corresponding short- and long-term objectives that propel sustainability efforts at Western Michigan University on local, national, and global scales.
5) Students will be able to effectively articulate, through written and oral communication, their knowledge of and appreciation for complex, interconnected, and sometimes conflicting sustainability challenges across multiple perspectives.

2.1.2 Program overview

The Wesustain internship program is a one-semester, paid, cohort-based internship opportunity for students to learn about the history, current state, and trajectory for the campus sustainability movement. It is open to all students at the university; graduate and undergraduate students, international and domestic students with a GPA of 2.75 or higher are eligible to apply. The Office for Sustainability recruits students from all majors through university media outlets and communication receives on average 20-25 applications, and selects 8-10 students each semester. The Office for Sustainability especially encourages students from varying academic, cultural and personal backgrounds to make a diverse, multi-faceted cohort of interns in order to foster a culture of sustainability that is all encompassing and inclusive. The program functions at 6 to 8 hours a week. As this is a paid, extracurricular internship with no course credit, only few hours per week required for the program so that participation would be less likely to undermine from schoolwork and other academic commitments. These activities are designed towards achieving core competencies in five main learning outcomes. Each week’s readings, journal assignments, and activities are all integrated around a common theme or topic, additional required or encouraged activities include campus sustainability events and, leadership-oriented Strengths Quest, green wood working workshop, permaculture work days, composting workshop, job shadowing, and sustainable food center tour. As a homework, a set of readings are selected for each week based on that week’s theme along with a journal question geared toward reflection and critical analysis (Donders, 2016). These topics are broken down and brought into a larger, applicable context through active dialogue in weekly discussion meetings on Wednesday evenings. On Friday of that week, an event is planned for the interns to implement these principles in hands-on way.

2.2. Research Methods

2.2.1 Study Site Selection and Sampling Methods

The assessment process for the internship program has two goals: 1) to assess student progress and skills gained throughout the course of the internship, and 2) to assess the efficacy of the program itself with respect to content, context, and pedagogy. The assessment process includes pre-and post-assessment that consisted of 14 questions. The interns were given pre- and post-assessments containing the same questions and prompts. On the first meeting of each intern cohort are given the pre-assessment. On the last day of the internship, after they have had a full semester of readings, discussion, and experiential learning opportunities, they are given the post-assessment. Interns were asked to give their own definition of “sustainability,” rank the appropriateness of sustainability diagrams and defend their answers, and provide short statements demonstrating their knowledge and perspectives on a variety of topics discussed over the course of the semester; some of these broad topics include “affinity for all life,” “systems thinking,” “quality of life,” “(misconceptions about) the current state of the planet,” “sustainable food systems,” and “alternative energy.” The answers are graded according to a rubric that was developed in coordination with the assessment and internship learning objectives. Because the answers are qualitative in nature, we desired a quantitative matrix with
which to analyze the performance in a more objective manner. The assessments ask for “succinct, full sentences that reflect your current knowledge and perspectives on the topics covered throughout the semester”. To produce a quantitative measure from the pre- and post-assessment, the short statements written on each topic were ranked on a scale from 0 to 4 (a potential total of 56 points for the entire assessment) depending on the perceived “correctness” (i.e., depth, clarity, factual accuracy) and completeness of the response. By utilizing inter-observer agreement, the Office for Sustainability team improved reliability while translating the written answers of each student into a quantifiable score (0-4). The answers were graded separately by two staff members at the Office for Sustainability, whose answers were then averaged for each question and for each student individually.

Table 1. Pre-and post-assessment result of Cohort Fall 2018.

Table 1, displays the example of the pre- and post-assessment results of one sample internship cohort to help visualize student progress and skill development. The areas analyzed are: sustainability as a concept (1+2), affinity for all life (3), systems thinking (4), quality of life (5), conceptions about the state of the planet (6), consumer culture (7), major energy sources and alternatives (8), environmental justice (9), transportation (10), food systems (11), recycling (12), behavior change (13) and local sustainability issues (14). This assessment tool is easy to implement and collect a reliable data and doesn’t require extensive analysis.

2.2.2 Data analysis

The total 50 Wesustain interns between fall 2016 to spring 2019 comprised 6 cohorts who completed pre-and post-assessment and their data is was analyzed in this study. SPSS was used to calculate descriptive statistics and to run sign tests for test for statistical significance.

3. Results

Table 2: Cohorts

<table>
<thead>
<tr>
<th>Cohort</th>
<th>Frequency (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohort Fall 2016</td>
<td>8</td>
<td>16</td>
</tr>
</tbody>
</table>
The cohorts in the fall of 2016 until the spring of 2019. The interns all completed the pre-test and post-test exams to evaluate how much environmental knowledge they gained throughout the semester-long internship program.

### Table 3: Accumulative Internship Pre-Test and Post-test Sign Tests

<table>
<thead>
<tr>
<th>Question</th>
<th>Pre-Test</th>
<th>Post-test</th>
<th>Percentage Mean Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Standard Deviation</td>
<td>Mean</td>
</tr>
<tr>
<td>Sustainability</td>
<td>1.51</td>
<td>.75</td>
<td>2.31</td>
</tr>
<tr>
<td>Diagrams</td>
<td>1.98</td>
<td>.86</td>
<td>2.71</td>
</tr>
<tr>
<td>Affinity for All Life</td>
<td>1.56</td>
<td>.92</td>
<td>2.27</td>
</tr>
<tr>
<td>Systems Thinking</td>
<td>1.13</td>
<td>.92</td>
<td>2.02</td>
</tr>
<tr>
<td>Quality of Life</td>
<td>1.64</td>
<td>.84</td>
<td>2.15</td>
</tr>
<tr>
<td>State of the Planet</td>
<td>1.50</td>
<td>.81</td>
<td>2.06</td>
</tr>
<tr>
<td>Consumer Culture</td>
<td>1.61</td>
<td>.83</td>
<td>2.29</td>
</tr>
<tr>
<td>Alternative Energy</td>
<td>1.39</td>
<td>.91</td>
<td>2.12</td>
</tr>
<tr>
<td>Justice</td>
<td>.97</td>
<td>.90</td>
<td>1.84</td>
</tr>
<tr>
<td>Transportation</td>
<td>1.41</td>
<td>.68</td>
<td>2.17</td>
</tr>
<tr>
<td>Food System</td>
<td>1.44</td>
<td>.76</td>
<td>2.24</td>
</tr>
<tr>
<td>Recycling</td>
<td>1.16</td>
<td>.63</td>
<td>2.02</td>
</tr>
<tr>
<td>Behavior Change</td>
<td>1.14</td>
<td>.76</td>
<td>1.88</td>
</tr>
<tr>
<td>Local Issues</td>
<td>1.07</td>
<td>.92</td>
<td>1.91</td>
</tr>
<tr>
<td>Accumulative Question Scores</td>
<td>19.51</td>
<td>18.25</td>
<td>29.99</td>
</tr>
</tbody>
</table>

*P<.05, **P<.01, ***P<.001

The accumulative cohort scores for each question and the accumulative question scores resulted in a percentage mean increase from the pre-test to the post-test ranging from 31.1% to 89.69%. Interns significantly increased their knowledge from the pre-test and post-test scores about sustainability by 52.98%, affinity for all life by 45.51%, systems thinking by 78.76%, state of the planet by 37.33%, consumer culture by 42.24%, alternative energy by 52.52%, transportation by 53.90%, food systems by 55.56%, recycling by 74.14%, behavior change by 64.91%, local issues by 78.50%, and accumulative question scores by 53.72% (p<.001). Interns significantly increased their knowledge from the pre-test and post-test scores about justice by 89.69% (p<.01). Interns significantly increased their knowledge from the pre-test and post-test scores about diagrams by 36.87% and quality of life by 31.1% (p<.05).

4. Discussion
4.1. Knowledge Gained

The internship program increased intern knowledge, and pre-and post-assessment testing was a useful method of measuring intern knowledge gain. The total mean score of the interns’ pre-assessment for all 14 subjects tested was 7.41(24); the post-assessment score was 11.82 (24). The averaged normalized gain score is 4.41. Based on the result, the sustainability internship program content and model has been proven to be effective in increasing students’ gain of knowledge in sustainability issues. Informal observation is offered later in the discussion as further evidence of creating sustainability ambassadors on campus.

There is plenty of research evidence showing prerequisite pre-assessment and post-assessment can be particularly beneficial in evaluating effectiveness of the program (Richard, Kornell, & Kao, 2009) but only when teachers use the resulting information to help students master specific prerequisite knowledge and skills so to prepare for upcoming tasks (Gurskey, 2018). From Spring 2018, the Office for Sustainability adjusted grading earlier than usual, so throughout the semester the coordinator could focus on the subjects that specific cohort is lagging behind. Around the same time, Office for Sustainability began collecting the qualitative reflective essay that aims to capture interns’ self-reflection of their journey, engagement and reflect on their personal learning experiences. This assessment can be seen as a self-assessment which is used to look at an intern’s self-perception of growth attained through the internship. However, this qualitative assessment has not been incorporated for this study.

4.2. Limitations

There are several limitations that have been observed by program coordinators. One of the biggest challenges for students appeared to be the format of the assessment itself, in which students were given a general prompt and asked to write a few sentences about the given topic. While some students were very successful at writing succinct, accurate statements, this was a challenge for other students. During discussions, many students stated that they were not accustomed to having to write such concise responses that had such broad prompts. Despite this, the scores do show some degree of individualized improvement for most of the interns. The internship coordinators would argue that all students gained skills even if the scores do not accurately reflect this, which indicates an issue with the assessment itself. Correcting the “issue” would either involve having to provide more structured training on writing “complete” short answers, changing the format to multiple choice where there is one designated “correct” answer, or modifying the language on the existing assessment.

Along with wording and formatting, motivating students to complete the assessment can be challenging at times. It took several discussions to stress the importance of the pre-and post-assessment for the success of the internship program, some students still lacked the motivation. Another issue that ended up post-assessment scores was the tendency for some students to write general statements like, “this is very important” or “I have learned a lot about this,” but without providing much other information. Lastly, the internship program participation may increase student’s understanding and perception of complexity of sustainability and leadership skills, however knowledge exposure in sustainability topics does not necessarily guarantee that actual learning has taken place. Pre and post assessment is easy to use and reliable tool, however it is possible that what works for our program purpose in this specific context may not be effective for another purpose or different context. Future research needs to determine whether using pre-and-post-assessment needs to be self-assessment or is an effective tool to determine the gain of knowledge.

4.3. Ambassadors Created
The Office for Sustainability has observed numerous anecdotal examples of students exercising their sustainability knowledge, leadership skills, and passions post-internship. Former interns often seek employment and are hired at our Office for Sustainability. One particular set of interns from the same cohort gained employment at the Office for Sustainability and then strategically and consistently advocated for the creation and implementation of our first Diversity and Inclusion Action Plan. Former interns regularly attend Office for Sustainability events and activities.

On campus, we have observed former interns winning competitive grant money through the WMU Student Sustainability Grant Program to fund their on-campus action research ideas and initiatives. Other interns have participated in the all-student Sustainability Grant Allocation Committee, a decision-making body that steers grant money toward the most promising student ideas each semester. Interns have gone on to lead sustainability and environment focused Registered Student Organizations and influence student government processes on campus. We have also observed former interns committing to the sustainability pathway of the WMU Signature Program, which recognizes students’ co-curricular activities with a “signature” on their diplomas. In the community, we have observed former interns choosing to remain local after graduation and taking jobs managing the Kalamazoo Farmers Market (local food systems) and assisting the City of Kalamazoo with community and sustainability planning through Americorps. Beyond Kalamazoo, we have observed two former interns enter the Peace Corps.

4.4. Program Improved

The internship program is fully established as a program of the Office for Sustainability. Application numbers have increased over time, few students have dropped out of the program, and written student intern reflections provide compelling testimonials of what the program has meant to students.

Future opportunities exist for further analysis of intern cohorts by academic background, gender, academic focus, nationality, immigration status, language, etc. Program effectiveness post-internship has not been formally measured, but an opportunity exists to survey former interns who are now on campus, working locally, or participating in the global workforce. Learning outcomes have not been revised and only minor adjustments have been made to the original selection of internship units.

The Office for Sustainability is contemplating how the internship program relates to sustainability across the curriculum. Academic degree programs like Environmental Studies are well established and growing. WMU has updated the General Education Program and the newly named Essential Studies Program features a planetary sustainability track with associated outcomes. Finally, the Signature Program is attracting national attention and sustainability remains a popular pathway. The internship program is a unique way for business, art, aviation, and engineering students to connect with sustainability outside of their traditional academic programs. As WMU continues to infuse sustainability and climate change topics across the curriculum, the internship program may provide useful insights and lessons-learned, and it will need to evolve with university-wide offerings.

5. Conclusion
This study concluded that the internship program increased student knowledge, and that pre- and post-assessment testing was a useful method of measuring student knowledge gain. The combination of testing with qualitative reflections/assessment revealed opportunities for internship program improvements and improvements were made. Anecdotal observations of students post-internship offer additional evidence of WMU Office for Sustainability, on-campus, and post-graduation community sustainability “ambassadoring”. The internship programs main strength remains, it offers students from all academic backgrounds an opportunity to dig deep into sustainability, build a network, gain knowledge, develop leadership skills, become ambassadors, and immediately apply what they have learned on campus and in the local community. On-campus internships are unique learning opportunities worthy of study and refinement. Our internship promotional materials are available online at www.wmich.edu/sustainability. Operational materials are available upon request including readings, discussion prompts, pre-post assessments, the evaluation rubric, etc. Contact the Western Michigan University Office for Sustainability to request materials.

6. References


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