
AC 2012-5257: AN INTERDISCIPLINARY MASTER'S OF SUSTAINABILITY PROGRAM

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David Webb joined Saint Louis University in 2010 as a Graduate Assistant and student in the inaugural class of the master's of sustainability degree program. Almost one year later, he accepted a full-time position with the Center for Sustainability as Program Manager, where he directs academic program development and oversees student relations and marketing and communication efforts. Prior to joining the Center for Sustainability, Webb spent nearly 14 years working in the field of information technology. He started his career as a Management Consultant with Cap Gemini Ernst & Young in their Business Intelligence division and later worked as independent Customer Relationship Management (CRM) consultant. He has designed, developed, and supported custom database solutions for companies of all sizes, from individual business owners to global enterprises. His work has exposed him to numerous industries, including finance, real estate, entertainment, telecommunications, transportation, health care, and higher education to name a few. Webb holds a bachelor's of science in business administration and a bachelor's of arts in Spanish from Saint Louis University. He will complete his master's of sustainability degree in the spring of 2012.

An Interdisciplinary Master of Sustainability Program

Abstract

A two year interdisciplinary Master of Sustainability program integrates knowledge on sustainable business practices, effective public policy and innovative design and engineering approaches. The rigorous coursework and field training offered will enable our graduates to confront sustainability related issues with a systems approach to solution development. In its initial phase the program was structured as a cohort, requiring a common first year of foundational core courses that covered general sustainability topics across the degree's integrated disciplines: Business, Engineering and Technology, Public Policy and Social Work, and Environmental Sciences. Students progressed through each of these first-year courses together as a team. The second year was originally structured around tracks, where students had the opportunity to focus in more detail in one of the disciplines introduced in the first year. Two comprehensive, multi-faceted program assessments one at the end of the first semester of the program and one at the end of the first year resulted in significant changes to the curriculum. Now in its second phase, the program has eliminated the cohort model as well as the second year focus tracks to allow greater flexibility for students and faculty mentors. The first year remains focused on delivering a broad, foundational understanding of sustainability across multiple disciplines. Also unchanged is the Capstone requirement, a culminating field experience designed to immerse the student into a practitioner role inside and organization or group that connects to their respective discipline, area of interest, or career goals. A minimum of 30 credit hours is required for the Saint Louis University's Master of Sustainability. Continuous assessment is an integral part of the program to ensure its quality and continued updates.

Introduction:

In 2008 the International Commission on Education¹ for Sustainable Development identified a need in the marketplace for practitioners in sustainable development, with core competencies in natural sciences, engineering, social sciences, and management. Within higher education, sustainability related curriculum was once considered “leading_edge” and only offered as certificate programs or as electives within existing degrees. Today, innovative universities have begun to offer sustainability related degree options at both the undergraduate and graduate levels^{2,3}.

For nearly 200 years the Saint Louis University has trained thousands of leaders to discover something better within themselves and in the world around them. The Masters of Sustainability degree continues that tradition, and promises to be a critical program to support the University's mission of creating men and women for others.

The center for sustainability was established in the fall of 2010. The center has established a Master of Sustainability program. The two year interdisciplinary Master of Sustainability program integrates knowledge on sustainable business practices, environmental sciences, effective public policy and innovative design and engineering approaches. Rigorous coursework and field training will further enable our graduates to confront sustainability related issues with a systems approach to solution development.

The program has attracted students from diverse backgrounds at various stages of their careers. Currently in its second year, the MOS program has more than 30 traditional and nontraditional students. The continued success of the program is greatly due to collaboration by faculty members with varied expertise, as well as the significant amount of attention and support it has drawn from the University and local corporations. Major financial support from one local corporation in particular will ensure the ongoing success of the program. Additionally, the curriculum, instructors, course materials, and methodologies are assessed on a regular basis using the Academic Quality Improvement Process (AQIP) developed by the Center for Sustainability. The main purpose of the paper is to present some unique features of the newly developed Master's program.

Program Phase I:

First Year Experience

The first group of admitted students required to be enrolled in a set of core courses presented in table 1. The required core courses taken during the first year enable a sharing of background and experiences, while providing a critical knowledge foundation upon which to build throughout the program. Candidates are able to identify how sustainability concepts, models, and theories connect, thereby reinforcing the systems perspective necessary to work productively across disciplines on sustainability problems. The core curriculum is designed to provide students with a holistic understanding of sustainability across multiple disciplines including **business, engineering/technology, environmental sciences, and public policy/social work**. By the end of the first year, students will be conversant in a wide range of sustainability topics and prepared to focus their skills in year two. The capstone course/experience is carried into the second year.

Course Title	Credit Hours
<i>Required</i>	18
Sustainability Foundations	3
Sustainable Business Practices	3
Environmental Aspects of Sustainability	3
Sustainability in Society and Culture	3
Engineering a Sustainable World	3
Sustainability Capstone	3

Table 1: First year common core curriculum

Second Year Experience

The core courses are designed to establish a foundation of sustainability knowledge upon which students can build in their second year of study. Beginning in their second year, candidates have the option to build a custom curriculum that supports a broad sustainability practitioner career path (sustainability generalist) or a specific discipline-oriented focus. Students are highly encouraged to meet with their advisors to tailor course work to better meet students' goals. The second year concludes with a field experience designed to immerse the candidate into a practitioner role inside an organization or group that connects to their respective discipline or area of interest.

A minimum of 30 credit hours is required for the Saint Louis University's Master of Sustainability. All core courses and most electives are offered in the **evenings** or on **weekends** to accommodate working professionals and others with busy daytime schedules.

The first group of admitted students interested in any of initial four focused area were provided career tracks to complete. They were to choose at least four courses in any one focused areas. The program has since expanded its focused areas to better meet the needs of the students and sustainability community. Initially the program required minimum of 35 credits for graduation. Upon review of the program at the end of the first year, input from various constituents, and expansion of the program beyond initial four focused area changes to program requirements were made. The first year experience was updated as presented in the earlier section and the program requires 30 credits instead of initial 35 credits for graduation. The updates have presented students with greater flexibility as well expanded course offering⁴.

Table 2-4 presents several sustainability related courses in each of the initial tracks. Presently, students enrolled in the program have greater choice in course and track selection⁴.

Course Title - Choose 4 courses	Credit Hours
<i>Sample of Engineering courses</i>	
Sustainability Energy Technologies I	3
Sustainability Energy Technologies II	3
Sustainability Energy Technologies III	3
Sustainable Product Design and Engineering	3
Design from Bottom of Pyramid	3
Creativity, Innovation in Sustainability	3
Regional, National, and Global Issues in Sustainability	3
Sustainable Enterprise	3
Urban Engineering	3
TOTAL CAREER TRACK HOURS	12

Table 2: Engineering and Technology Track

Course Title - Choose 4 courses	Credit Hours
<i>Sample of Business courses</i>	
Strategy and Sustainability	3
Legal, Ethical and Professional Environment of Business	3
Project Management	3
Sustainable Entrepreneurship	3
Sustainable Supply Chain Methods	3
Global Business Environment	3
Managing Information Technology	3
TOTAL CAREER TRACK HOURS	12

Table 3: Sustainable Enterprise Development (Business) Track

Course Title - Choose 4 courses	Credit Hours
<i>Sample of Public Policy and Social Work courses</i>	
International Social Work	3
The Metropolis	3
Research Methods for Public Policy Analysis	3
Research Methods for Social Work	3
Sustainable Economic Development	3
Urban Systems and Services	3
Land Use Planning and Analysis	3
Science, Technology and Public Policy	3
Organizational Theory and Behavior	3
Social Justice: Human Liberation and Community Building	3
Experiencing Community Among the Poor of Mexico/Ghana/India	3
Human Behavior and Environment	3
Social Work Practice with Communities and Organizations	3
Introduction to Non Profit Organizations and Management	3
TOTAL CAREER TRACK HOURS	12

Table 4: Sustainable Development Policy and Practice (Public Policy and Social Work) Track

Program Continuous Assessment

The program has been set to be assessed on a continuous basis both at the program level as well as individual course level.

The Program Level Objectives⁴ presented below is assessed on annual basis by engaging program constituents.

- **Holistic** - The program is interdisciplinary and focused on whole systems.
- **Humanistic** - The program embodies the principles of service and justice found in the university mission statement.
- **Collaborative** - The program recognizes that individuals must work together to address complex problems.
- **Applied** - The program focuses on the application of knowledge to address real-world problems.

The Center for Sustainability developed the Academic Quality Improvement Process as a means to gather comprehensive qualitative and quantitative feedback on the program. The Center employed a 360-degree feedback process whereby structured and unstructured input was solicited from students, faculty, and staff.

AQIP employed several evaluation mechanisms to achieve this goal including, electronic instructor and course review surveys, program-level surveys, and focus groups.

Electronic Instructor and Course Review Surveys

The Center for Sustainability used the Qualtrics survey tool to develop and distribute a anonymous electronic surveys for each course, which were constructed primarily using Likert scales. The resultant data were summed per respondent and then aggregated into a single, overall score. Detailed data were also made available for drill down into specific questions or question groups for further analysis. Each survey also employed free-form text fields allowing the respondent to supplement their response with qualitative observations. Course and instructor feedback was made available to the professors and analyzed in detail by Center for Sustainability staff.

Program-Level Surveys

The program-level surveys followed the same format as the instructor and course review surveys. However, in this case the questions were designed to solicit feedback about the program overall. The Center developed a series of detailed questions around four core categories: methodology, content, instruction, and materials. A catch-all category called "other" provided the opportunity for students to add additional observations not explicitly covered in one of the four categories.

Focus Groups

The Center used an independent, third-party moderator to run four, one-hour focus groups averaging between three to five students each. The focus groups were structured as informal, in-person feedback sessions in which the students were encouraged to freely share their opinions on the program. Sample questions were used to help solicit input relative to the same categories used in the program-level surveys: methodology, content, instructors, material, and other. In

addition to the moderator, an annotator was employed to capture the session feedback. No identifying information was collected. The resultant notes from the four focus groups were compiled into a single document organized around the high-level question categories.

Utilizing these three approaches, AQIP delivered quantitative and qualitative data on the Master of Sustainability program in general as well as the individual courses, instructors, and materials. Comprehensive data sets combined with rigorous analysis and a 360-degree feedback process enabled the Center to quickly and effectively assess and act upon a weighted and prioritized set of recommendations. With AQIP, the Center achieved a level of responsiveness and adaptability uncommon in many higher education programs.

Program Updates – Phase II

The program has evolved significantly since its inception in August of 2010. Initially, students were required to complete 35 credit hours for graduation, comprised of 17 credit hours of core requirements and 18 hours of electives. The electives were structured using a "track" system, consisting of an Engineering and Technology track (Table 2), a Sustainable Enterprise Development track (Table 3), and a Sustainable Development Policy and Practice track (Table 4). Students were to choose a track and then complete a minimum of four courses from that focus area.

Based on a comprehensive program review conducted at the end of the first year, along with input from various internal and external constituents, the Center for Sustainability decided to alter the program. The track-based approach was replaced with the more flexible program architecture presented in the previous section. This new approach provided students with greater flexibility and an expanded pool of courses from which to craft a custom curriculum. Students could now either choose to specialize in an area of interest or take a generalist approach, mixing and matching courses from the various disciplines. The Center also opted to reduce the total required hours from 35 to 30, which was consistent with the majority of other graduate level programs at the University.

The new 30 credit hour requirement has set the stage for the next phase of program development in which the Center will offer a base Master of Sustainability degree at 30 credit hours with the option to take an additional six credit hours to add an area of emphasis to the degree. As of this publication, the area of emphasis has not yet been officially implemented.

Conclusion

The program has attracted students from diverse backgrounds at various stages of their careers. The program is currently in its second phase with enrollment of more than 30 traditional and nontraditional students.

The continued success of the program is greatly due to collaboration by faculty members with varied expertise, as well as the significant amount of attention and support it has drawn from the University and local corporations. Major financial support from one local corporation in particular will ensure the ongoing success of the program. In just eighteen months, the program has been successful in meeting and exceeding its established goals and objectives. The built-in continuous assessment process will ensure program's relevancy for coming years. The initial assessment data has shown a high level of satisfaction among current students and its achievements of program objectives. The program will graduate its first class in the May 2012.

Bibliography

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