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Campus Triple Bottom Line: College Sustainability and Grand Valley State University

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Colleges and universities in the United States and globally have mobilized around sustainability issues and engaged their campus community and communities-at-large in efforts to recycle, reduce carbon emissions, create green space, foster food security, and learn about and participate in creating sustainable communities. This study provides a literature review of sustainability programs within the United States and abroad, and commonalities across these programs were identified, grouped into four research streams, and used as the bases for the theoretical framework. This paper further expands on the subject of campus sustainability by presenting a case study of Grand Valley State University Sustainable Community Development Initiative, whose focus is to bring sustainable practices not only to the campus of Grand Valley State University (GVSU), but also to wider community stakeholders.

Review of Literature on Campus Sustainability Programs

Peer reviewed articles on sustainability programs within the United States and abroad were reviewed, and commonalities across these programs were identified and used as the bases for the theoretical framework. The articles that were examined were organized into four research streams: Research stream No. 1 (R1)—organizational learning and capacity building, highlights the campus as a learning organization for sustainable thinking and practices. Organizational learning has helped to create a campus culture that reduces waste, preserves the ecology, contributes to economic stability, and demonstrates socio-community responsibility. Research stream No. 2 (R2)—environmental management systems and strategy development, highlights environmental management systems (EMS) as a strategic tool for implementation and focuses on how colleges have established structural supports to implement, measure, and evaluate sustainability programs. Research stream No. 3 (R3)—student, education and involvement, is concerned with interdisciplinary approaches to student learning and sustainability. Interdisciplinary learning has allowed students to see the linkages between other areas of studies beyond the sciences, such as social science, community development, and political science. Students have been found to be formidable ambassadors for furthering sustainability both on and off campus. Students have also learned valuable skills that have led to personal job creation and entrepreneurship. Research stream No. 4 (R4)—local, regional, and global initiatives, looks at how colleges and universities have forged relationships with off-campus stakeholders. Higher education has brought the movement of sustainability beyond the campus to local, regional, and in some cases global initiatives (sees Table I).

Research stream No.1 (R1) overviews organizational learning and capacity building and highlights avenues in which the college campus can learn together of the importance and need for sustainable thinking. Organizational learning has helped to create a campus culture that looks at ways to reduce waste and contribute to the environment, ecology, and socio-community responsibility. Downey (2004) offers reflections on Sheffeld Hallam University's learning and capacity building through its transition from environmental focus to sustainability with emphasis towards corporate social responsibility. Gudz (2004) shares the need for universities' sustainable development policy to integrate teaching, research, operations and local community relations and move towards learning organizations that enable relationship-building and the development of learning capacities. Albrecht, Burandt, & Schalteggar's (2007) exploration of sustainability projects as a stimulation of organizational learning and creation of transparency adds to the discussion of creating legitimacy of universities' sustainability initiatives through action research.

Research stream No. 2 (R2) looks at environmental management systems (EMS) as a strategic tool for implementation and focuses on how colleges have set up structural supports to implement, measure, and evaluate sustainability programs. Price (2005) asserts that universities need to move from the preception that environmental management systems are marginally important and

Table I.
Summary of Literature on Campus Sustainability

Stream/Article	Methodology	Findings
Research Stream 1 *Strategy and* *Environmental Management Systems*		
Clarke, Kouri (2009)	Discussion/Case Study	Discusses various Environmental Management Systems from informal to formal frameworks and implications of EMSs as related to institutional drivers that led to framework implementation
Fisher (2003)	Discussion/Case Study	Discusses the use of ISO14001 as a tool for environmental review or management systems
Price (2005)	Overview/Case Study	Perception of Environmental Management Systems use in most UK universities settings as marginally important. Case study of University of Glamorgan Wales as first to have all operations accredited to ISO 14001
Spellerberg, Buchan, Englefield (2004)	Discussion/Case Study	Discusses the use of environmental policy and policy into practice as adequate for progress without the adoption of a formal EMS. Illustrates this via case study of Lincoln University, New Zealand
Research Stream 2 *Organizational Learning and Capacity Building*		
Albrecht, Burandt, Schaltegger (2007)	Theory Building/Case Study	Examines the use of transparency as incentive for organizational change, draws on theoretical concepts from organizational learning and applications to university context
Downey (2004)	Reflective/Case Study	Highlights the transformation of the Sheffield Hallam University, UK incorporation of sustainable practices within the formal university structure and advantages of student engagement
Gudz (2004)	Discussion/Case Study	Analysis of implications for organizational learning in preparing for creating a sustainable development policy. Embedded case study of University of British Columbia Faculty of Agricultural Sciences learning experience
Research Stream 3 *Student Education and Involvement*		
Domask (2007)	Case Study	Shows interdisciplinary curriculum, student work experiences and employment opportunities as effective learning approaches to sustainability
Bhasin, Bjardotti, Das, Dock, Pullins, Rosales, Savanick, Stricherz, Weller, (2003)	Case Study	Campus and community engagement in sustainable development through sustainability networks, initiatives and educational programs
Stubbs, Crocklin (2008)	Literature Review/Case Study	Development of a sustainability framework to teach business student to use critical and reflective thinking and analysis of sustainability beyond the neoclassical economic thinking in which MBA students engage
Owens, Halfacre-Hitchcock (2006)	Case Study	Sharing of experience of students who implemented a sustainability initiative and measured its effect on both faculty and student attitudes, information levels and behaviors regarding sustainability
Walker, Seynour (2008)	Case Study	Investigates the use of the design charrette as a sustainability teaching tool and assessment of charette's role in promotion of sustainability in higher education
Research Stream 4 *Local, Regional, and Global Initiatives*		
Mochizuki, Fadeeva (2008)	Conceptual Paper	Provides an overview of the United Nations University's Regional Centres of Expertise on Education for Sustainable Development (RCE)
Itoh, Suemoto, Matsuoka, Ito, Yui, Matsuda, Ishikawa (2008)	Case Study	Highlights the Regional Centre of Expertise (RCE) on education and the contribution of Kobe University as a RCE
Stefanovic (2008)	Case Study	Highlights the role the University of Toronto has had in establishing a Regional Centre of Expertise (RCE) in Education for Sustainable Development in Toronto and the RCE's impact on the larger community and its partnerships
Keen and Baldwin (2004)	Case Study	An analysis of student involvement in community-based research and service learning programs

a "soft control issue" and separate from campus sustainability operations to a more integrated system within university sustainability. Clarke & Kouri (2009) highlight many different frameworks of EMSs: ISO14001; Higher Education 21 (UK); the EMS Self-Assessment Checklist (USA); the Auditing Instrument for Sustainability in Higher Education (Netherlands); The Osnabrück University model (Germany) and the Sustainability University Model (Mexico). They argue that colleges and universities require EMS frameworks that are specific to their sector yet consider individual institution drivers. Fisher (2003) highlights EMS as a way to bring the business world into the classroom, which may provide usefulness for environmental education. Spellerberg, Buchan, & Englefield (2004) argue that an environmental policy and implementation plan can be just as appropriate and effective as an EMS and illustrates this through a case study of Lincoln University in New Zealand.

Research stream No. 3 (R3) is concerned with the interdisciplinary approach to involvement of students in education and practice in the area of sustainability. Students have been found to be formidable ambassadors for furthering sustainability both on and off campus. This engagement has allowed students to see the linkages between other areas of studies beyond the sciences, such as social science, community development, and political science. Students have also been able to learn valuable skills that have led to personal job creation and entrepreneurship. Domask (2007) lauds the benefits of experiential learning and shows how it can accomplish connecting the academics with real-world practice; foster interdisciplinary curriculum implementation; link students to practicum and job opportunities; and engage and empower students in the academic learning process. Stubbs and Cocklin (2008) create a framework in which business MBA students can look at varied aspects of sustainability in business (ecocentrism, ecological modernization and neoclassical economic paradigm) and use critical thinking and reflection to expand their knowledge of the "schools of thoughts" around sustainability and be able to articulate each side of the sustainability debate. The impact of a culturally diverse, student led, nine-part series exploring international sustainable development issues formed the basis for the University of Minnesota's efforts in moving its sustainability initiative forward (Bhasin, Bjardotti, Das, Dock, Pullins, Rosales, Savanick, Stricherz, Weller, 2003). Walker and Seymour (2008) share the benefits of using interdisciplinary studies as a means for students to explore sustainability. More specifically, the focus was on an example of a design charrette that involved students, faculty, and professionals from the areas of architectures, civil engineering, business, natural sciences, landscaping contracting, and management in analyzing the complex issues of the devastation of the Mississippi Gulf by Hurricane Katrina in order to create a conceptual model of sustainable development in the area.

Research stream No. 4 (R4) looks at how colleges and universities have forged relationships with off-campus stakeholders. Higher education has brought the movement of sustainability beyond the campus to local and regional initiatives, and in some cases, participated in global initiatives. The papers reviewed include case studies of various universities' involvement with the United Nations University Institute for Advanced Studies (UNU) Regional Centre of Expertise (RCE) on Education for Sustainable Development, which is a "network of existing formal, non-formal, and informal education organisations, mobilised to deliver education for sustainable development to local and regional communities" (United Nations University Institute for Advanced Studies, 2010). Mochizuki and Fadeeva (2008) provide an overview of the RCE and how institutions of higher education (IHEs) can create linkages that allow them to break from compartmentalization of knowledge and to link campus policies with practices. They further highlight that IHEs that are partners in RCEs can use action research as a means to modifying action rather than generating new knowledge (Mochizuki and Fadeeva, 2008, pg. 378).

Itoh, Suemoto, Matsuoka, Ito, Yui, Matsuda, and Ishikawa (2008) reinforce these thoughts by showing how the RCE Hyogo-Kobe University built on existing education for sustainable development work that had begun at Kobe University, which created opportunities for interdisciplinary action research in collaboration with regional stakeholders and created further opportunity for internal coordination within the university. Stefanovic (2008) highlights the work of University of Toronto and the establishment of a RCE. The work that was done at University of Toronto focused on relevant interdisciplinary action research that helped students and professors bring environmental awareness and make an impact on the local and broader communities and represent equity and diversity in programming. Keen and Baldwin's (2004) research focuses on collaboratively designed research between institutions of higher education and the community. Findings included students being influenced on their life choices as it pertained to environmental concerns, increased ability to deal with complexity, and engagement with others and a valuing of perspectives.

The four research streams served as a context to explore the sustainability practices in each case study and to provide a lens through which to view the sustainability practices of the Grand Valley State University Sustainability Initiative. In addition, the research streams and the Grand Valley Case Study allow for the formation of a theoretical framework and a suggested implementation model for institutions of higher education that would like to start a sustainability initiative. These areas will be further discussed in the remainder of this paper.

Grand Valley State University Sustainable Community Development Initiative

Grand Valley State University (GVSU) is a four-year public university providing fully accredited liberal undergraduate, graduate and PhD programs. GVSU's main campus is located in Allendale, Michigan, with campuses in downtown Grand Rapids, Holland, Muskegon, and Traverse City, Michigan. In addition, it works in cooperation with other colleges and universities at two regional centers, one in Muskegon and the other in Traverse City. GVSU has over 24,400 students supported by 2,890 faculty and staff (Grand Valley State University: 2008 Sustainability Indicator Report, pg. 1-2).

The GVSU Sustainable Community Development Initiative (SCDI) officially began in 2004 with the adoption of guiding principles that emphasized the triple bottom line of sustainability and led to the formal creation of the Sustainability Initiative within the College of Interdisciplinary Studies (GVSU Sustainability Recognitions, 2010). The SCDI was one of the founding members of the Community Sustainability Partner-

ship (CSP), which was first comprised of Grand Valley State University, the City of Grand Rapids, Aquinas College, Grand Rapids Community College, and Grand Rapids Public Schools. It has now grown to 189 endorsing partners as of March 2010 (Community Sustainability Partnership, April 2010). As a member of CSP, GVSU is also a participant in the first U.S. designation of Grand Rapids Regional Center of Expertise (RCE). The SCDI has received recognition in many areas, and highlights include national recognition for Sustainability Innovation from the Sustainable Endowment Institute, 2008 U.S. Green Building Council recipient, 9 LEED facilities, and President Thomas Haas's signing of the Talloires Declaration and The American College & University Presidents Climate Commitment (GVSU Sustainability Recognitions, 2010).

The SCDI's work is guided by many thought leaders in sustainability but notably the SCDI's Sustainability Initiative model is based on the work of Dr. Anthony Cortese, ScD of Second Nature (figure 1). This model complements the research streams previously discussed and will be interwoven throughout the case study discussion, as it offers examples of the research stream in practice. This case study will not focus on the linear history of the GVSU SCDI as much as it will highlight activities that correspond to the research streams and the GVSU SCDI model. Thus the focus from this point will be the following: Education for Sustainable Development (Research stream No. 1. —Organizational Learning & Capacity Building), Campus Dining and Facilities Services (Research stream No. 2—Strategy and Environmental Management Systems), Student Involvement and Service Learning (Research stream No. 3—Student Education and Involvement), and Community Development (Research stream No. 4). As previously mentioned, the research streams form the lens through which to explore GVSU SCDI and the formation of the theoretical framework that will follow.

Education for Sustainable Development (Research stream No. 1—Organizational Learning & Capacity Building)

Education for Sustainable Development (R1) is focused on campus awareness and learning about sustainable practices. The GVSU SCDI model formed the basis for building awareness throughout the campus and helped to establish a common framework from which to work on threading sustainability concepts and practices that were to come. GVSU SCDI has used many ways to build awareness and encourage participation from staff, faculty, and students. The initiative has created a dynamic website that is rich with information and resources for students, faculty, and the community.

The most notable efforts have been through the campus wide sustainability week, RecycleMania (a national competition) and interdisciplinary studies. Sustainability Week focuses on various topics and activities around sustainability. Students and faculty are encouraged to participate, and faculty are encouraged to integrate the topic of sustainability into their lesson plans. RecycleMania is competition over a 10-week period that is held between college and university recycling programs in the United States "to see which institution can collect the largest amount of recyclables per capita, the largest amount of total recyclables, the least amount of trash per capita, or have the highest recycling rate" (RecycleMania is Here! April 10, 2010).

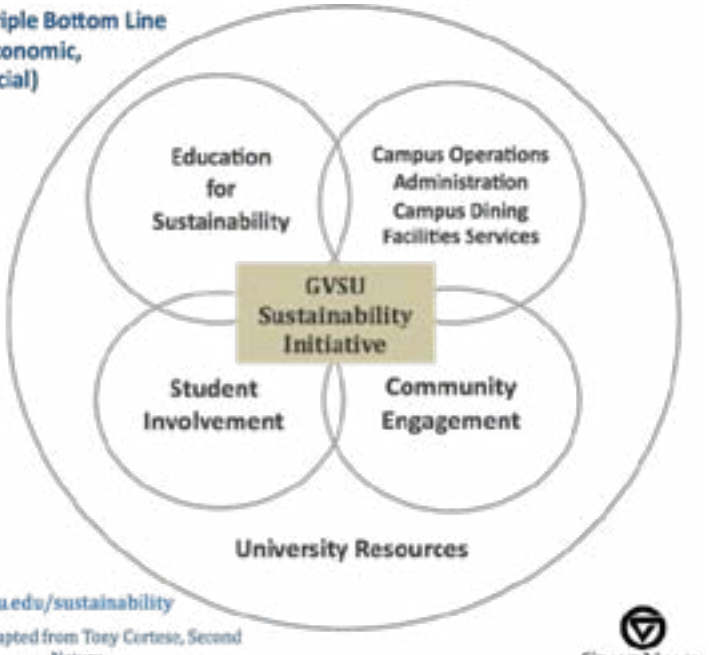
Campus Dining and Facilities Services (Research stream No. 2—Strategy and Environmental Management Systems)

This area focuses on the administrative strategies and the embedment of sustainable practices in operational areas. It is important that institutes of higher education leadership support sustainability by setting the tone and helping to create awareness, interest, and involvement (Velazquez et al., 2005, pg. 384). GVSU leadership began to set this tone in the creation of sustainability indicators, and President Thomas J. Haas's signing of the Talloires Declaration and The American College & University Presidents Climate Commitment (GVSU Sustainability Recognitions, 2010).

Each year, since the SCDI's start, Campus Dining Services have increased sustainable practices without compromising the quality of food or service. This unit has focused on sustainable procurement from local sources (including fair trade sources) and seafood sources that focus on sustainable practices in farming (Grand Valley State University: 2008 Sustainability Indicator Report, pg. 4-10 through 4-11). Campus Dining Services has also focused on waste management and recycling by elimination of trays, which helped in reduction of energy, water, and detergent use, saving 1,619,000 gallons of water from 2007-2008 (Sustainability and Campus Dining, 2010).

Campus Facilities Services has participated in campus recycling efforts and the guidance

Figure 1. GVSU's Triple Bottom Line (Sustainability – Economic, Environmental, Social)



and coordination of engineering projects, which includes new and existing building energy efficiencies. Facilities have worked diligently to bring awareness via information distribution and energy awareness competitions within the Housing department. These efforts have benefited GVSU, and overall electricity consumption has decreased from 55 million kilowatts in FY2006 to less than 53 million kilowatts in FY2008. Energy reduction awareness has created an annual savings of $861,000 since 2001 (Grand Valley State University: 2008 Sustainability Indicator Report, pg. 4-6).

GVSU Facilities Services continues to evaluate opportunities to incorporate alternative energy use in operations. As explained in the GVSU 2008 Sustainability Indicator Report, some most notable examples are the use of alternative energy sources in the Laker Turf Building (Allendale Campus), Michigan Alternative and Renewable Energy Center (Muskegon) and the John C. Kennedy Hall of Engineering Building (Robert C. Pew Grand Rapids Campus):

> Grand Valley – the Laker Turf Building and Michigan Alternative and Renewable Energy Center (MAREC) – incorporate photovoltaic as a partial energy source to provide power to building energy controls and some building heat support. Geothermal wells also have been added as an alternative energy option for the Turf Building. Geothermal technology helps maintain the heating and cooling levels within the building by transferring heat from the wells to the building in the winter, and from the building to the cooler wells in the summer months. Ice block technology was added to our John C. Kennedy Hall of Engineering building on the Robert C. Pew Grand Rapids Campus. This technology, which allows us to freeze a large ice block during nighttime hours, helps cool refrigerant lines during the daytime hours and helps offset peak electrical costs.
> (Grand Valley State University: 2008 Sustainability Indicator Report, pg. 4-7).

Other areas of focus include the decrease of water use to 151.5 million gallons in FY2008, and surface water quality and storm water management systems and planning, which includes the use of rain gardens and sustainable landscaping practices (Grand Valley State University: 2008 Sustainability Indicator Report, pg. 4-8 through 4-10).

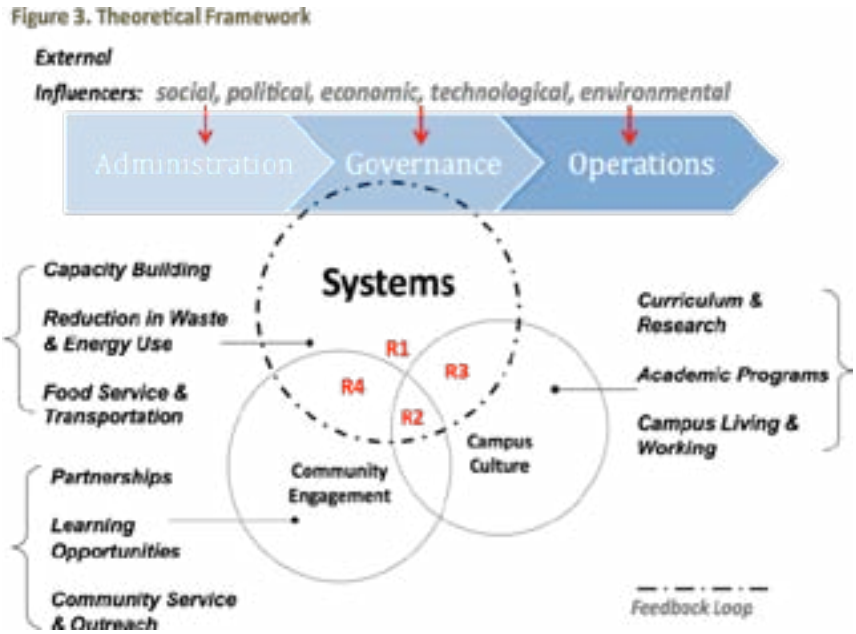
Student Involvement and Service Learning (Research stream No. 3—Student Education and Involvement)

GVSU wanted to show commitment to their work in sustainability by establishing interdisciplinary studies and student involvement in service learning projects. Included in this area are the aforementioned Sustainability Week and RecyclingMania programs. The interdisciplinary studies provided at GVSU offer students and faculty the opportunity to engage deeply in the area of sustainability. Students have the opportunity to major or minor in a Liberal Arts degree in sustainability. Students and faculty are also afforded the opportunity to gain knowledge and build skills in service learning projects and internship and research opportunities. Notable activities beyond the classroom include the Student Sustainability Partnership, which focuses on bringing to together SCDI students and student organization leaders to collaborate on sustainability projects (Sustainability Community Development Initiative, Student Sustainability Partnership, 2010), and a most recent internship project with West Michigan Symphony, Sustainability: A West Michigan Journey, which focuses on "a multi-media concert based on sustainability with supporting education and community engagements programs" (Sustainability Community Development Initiative, Internships, 2010). These activities add variety by allowing the student to engage outside of the classroom and text and create mutual understanding and practicality of sustainability between the community and the student.

Community Engagement (R4)

Since its inception, the GVSU SCDI has worked to foster connections and learning between the various GVSU campuses and the wider community. These connections have created viable partnerships that have added to community awareness of sustainable practices as well as advancing community and economic development. As noted before, GVSU SCDI's participation in the Community Sustainability Partnership (CSP), the Grand Rapids Regional Center for Expertise in Education and Sustainable Development (a United Nations University Institute of Advanced Studies program), and GVSU President Haas as signatory to the Talloires Declaration and The American College & University Presidents Climate Commitment all create local, national and international visibilities. GVSU is participating in the de-

Figure 2.
Definition of Campus Triple Bottom Line
(Sustainability – Economic, Environmental, Social)



velopment and monitoring of city and community sustainability indicators reports as well as assisting with developing sustainable neighborhoods and communities (GVSU, Making it Happen, Applied Sustainability at GVSU, 2009).

An additional area that should be noted is the Grand Valley State University Michigan Alternative and Renewable Energy Center (MAREC) housed in a LEED certified (Gold) facility that opened in fall of 2003. Among the collaborators were the Community Foundation for Muskegon, Muskegon Area Chamber of Commerce, and Muskegon First. MAREC's focus is on creating economic development opportunities in the area of renewable and alternative energy providing space and support for uniquely focused and innovative business start-ups and projects in these areas. GVSU SCDI highlights that "MAREC's strategic focus revolves around four key initiatives: 1) managing a leading-edge facility, 2) implementing visionary energy projects, 3) providing alternative energy education, and 4) supporting the economic development of Muskegon and the state" (Sustainability Community Development Initiative, LEED Buildings, 2010).

Theoretical Framework for Sustainability

The four research streams and the GVSU case study have contributed to the development of a theoretical framework for sustainability that can be used by institutes of higher education as they look to incorporate sustainable practices on their campus or develop a campus wide initiative focused in this area.

The proposed Theoretical Framework for Sustainability works from the perspective of the Triple Bottom Line, as illustrated in Figure 2: Definition of Campus Triple Bottom Line. The main focus here is on contributing to the viability and sustenance of the community via economic prosperity, social responsibility as demonstrated by community involvement and support, and being a good steward of the environment and ecology.

The Theoretical Framework for Sustainability (TFS) model (Figure 3) looks at external influencers that impact an institute of higher education's participation in sustainability. Administration, Governance, and Operations are all impacted by social, political, economic, technological, and environmental external influencers. In general terms, a college or university may decide to engage in sustainability initiatives out of pressures or encouragement it may receive from the external environment. Pressures could include social, political, or economic student activism around the procurement of resources or supplies from an unsustainable or inhuman source (for example: boycott of university pennant shop goods because of the use of sweatshops, or factory farming use). Technological and environmental pressures could come into play when facilities and Information Technology departments are pressured to maximize resources and minimize waste. Both facilities and IT personnel are pressured to build sustainable practices into overall operations. Both groups have massive responsibilities throughout the campus and often multiple sites.

In the TFS Model, a main driving point is the creation of administrative, governance, and operational systems that support, interact and connect with the campus and community. This system has embedded in it capacity building, waste and energy reduction and sustainability practices around food service and transportation. These systems should foster a campus culture that includes research and interdisciplinary curriculum and academic program development. It should also insure that it integrates principles of sustainability into campus living and working environments. It should further integrate community engagement opportunities that focus on partnerships, learning opportunities, and community service and outreach. Integral to this system is a constant feedback loop of communication.

Campus Administration can begin the work of sustainability by putting into place a Proactive Implementation Model for Sustainability (PIMS). Figure 4 shows a suggested PIMS for phasing in sustainability onto the campus. Phase 1 looks at creating a learning organization and building capacity around sustainable practices. In this phase, an understanding of what sustainability is and ways to achieve it is developed. Top leadership is crucial to this first phase. In reflecting on the GVSU case study, it can be seen that the participation of the president of GVSU, Thomas J. Haas, was an integral piece to leading the charge of creating a campus environment for this change.

The second phase focuses on setting visions and objectives, identifying champions, forming teams and putting into place assessments and reviews that help to support the initiative. A system for strategy and environmental management, the GVSU Sustainability Indicators were shown to be important in bringing attention to the need for GVSU to focus on sustainability. This document was the catalyst for the campus community to become involved in creating a campus environment that fosters sustainability.

The third phase looks at implementation

Figure 4.
Proactive Implementation Model for Sustainability (Phases)

and programming. The second phase can be the driver for more substantial work to be carried out in the areas of procurement, facilities, interdisciplinary curriculum development, campus participation in local, regional, and global initiatives, and faculty and student involvement in programming. GVSU and other college campuses highlighted in this research became involved in both on campus and off-campus initiatives. For some institutions of higher education, off-campus engagement can be a starting point for sustainability projects.

The fifth and final phase focus is on incorporation of continuous learning and improvement at a systemic level. This can be accomplished through program evaluation practices, such as sustainability indicators, or more targeted work around climate action. This phase also focuses on looking at redesign and revision as a part of growing and developing.

The research streams and the implementation phases can be conceptually integrated to show the relationship between the theory and suggestion for program development, implementation, and monitoring.

Conclusion

The campus sustainability programs that were reviewed varied in form and demonstrated broad and diverse methodologies and applications of data collection, programming, stakeholder involvement, and program measurement. The examples from the research streams and the Grand Valley State University Sustainable Community Development Initiative show that there is room for applying models for a Theoretical Framework for Sustainability and Proactive Implementation. Institutes of higher education should examine critical success factors that can help and inhibit the quality and effectiveness of campus sustainability programs before and during the process.

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