
Sustainable Academic Libraries: A Campus Partnership at Michigan State University

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Abstract

Through the sharing and reuse of materials, libraries have an inherent sustainability as institutions that reduce the environmental impact associated with producing informational resources. Libraries must, however, take additional steps in order to be truly sustainable. This paper describes the Michigan State University Libraries' history of sustainable development, both independently and in collaboration with the MSU Sustainability Office. The MSU Libraries has been a pioneer in sustainable development on campus, creating a Library Environmental Committee to organize educational programming and encourage sustainable practices within the library long before other campus units. The Environmental Committee, MSU Sustainability, and other operational departments on campus have collaborated on educational and programmatic projects, resulting in increased recycling rates in the library, decreased energy use, a 100 % landfill diversion rate for materials deaccessioned from the library collection, and a pilot program collecting compost from both public areas and office spaces. This paper will be useful for anyone interested in sustainability in academic libraries or sustainability based collaborations between campus units.

Keywords

Academic libraries • Sustainability • Collaboration • Campus operations

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1 Introduction

Michigan State University (MSU) is a large research institution founded in 1855 and located in East Lansing, Michigan, USA. MSU provides services to not only the student population of 39,143 undergraduate and 11,400 graduate students (Michigan State University 2015c), but also, as a land-grant university, MSU provides services to the entire population of the state of Michigan. MSU features a 5200 acre campus with 538 buildings, including residence halls, administrative offices, and 95 academic buildings (Michigan State University 2015c). University campuses typically require a significant amount of energy (Ohashi and Shimoda 2014) and MSU is no exception. Although the total CO₂ emissions have declined every year since 2010, the main campus still produced 477,089 million metric tons of CO₂ in 2014 (Michigan State University 2015b). In light of this large footprint, MSU is moving to develop sustainable operations on campus. Overseeing these operations is MSU Sustainability, a department of the Infrastructure Planning and Facilities (IPF) unit.

The ideas of sustainability and sustainable development have become so commonly used in the realms of business, politics, academics, and even popular culture that determining a single definition poses a challenge (Bookhart 2012). Many works discussing sustainability opt for describing it as an intersection between the disparate studies of economics, the environment, and social issues (Barlett and Chase 2004) or put another way: ecology, economy, and equity (Henk 2014). Pushing beyond this description, sustainability is also defined as a process in which the temporal present is transformed into a future that lasts for generations (Barlett and Chase 2004; Bookhart 2012). This chapter offers a reflection of sustainability through the changes to the ongoing processes within the MSU Library in collaboration with MSU Sustainability and other IPF units.

The library serves the information needs of MSU as well as community patrons throughout Michigan. The collection contains over 7.5 million unique volumes, many of which are housed in print in the Main Library (MSU Library 2015a). The Main Library is housed in a midcentury building divided between separate wings and totaling 458,913 square feet. Construction on the west wing completed in 1955 and the east wing in 1967 (MSU Library 2015b). The library's staff is comprised of 82 librarians, 123 support staff, and approximately 240 student employees and is a hub of activity on campus. The Main Library is open for use 24 h a day and gate count statistics show an average of 4580 people entering the Main Library over the course of a day. The MSU Library also features two branch libraries, but for the purposes of this chapter any discussion of the library will refer only to the Main Library building.

Libraries are frequently involved in promoting sustainable practices (Rowley 2006; Alpi 2000; Le Ber and Gregory 2004) and the MSU Library is no exception. The Library Environmental Committee (LEC) is one of the pioneering sustainability committees at MSU and has shared in collaborations with MSU Sustainability and several other closely related IPF departments. The shared history and

collaborative efforts of these closely aligned organizations has been instrumental in making the library a more sustainable and resilient.

2 Methods

The purpose of this chapter is to present a case study outlining both the historical development and current practice of sustainability at the MSU library. The methods used for data collection included field visits, virtual correspondence and in person discussions with stakeholders, and analysis of internal documents and current practice. These data combine to produce a picture of the partnerships driving sustainable development within the library. The expected outcome of this assessment is to provide a template for other library institutions to adapt for use towards sustainable development.

3 History of Sustainability at MSU

The MSU Library's history of green activity precedes the formal founding of LEC. As early as 1982, a group of library staff volunteers began recycling library subscribed newspapers, using personal vehicles to deliver the papers to an off-campus a recycling drop-off center. In 1988, the library installed recycling bins for newspapers, office paper, colored paper, and cardstock. The library also successfully lobbied the MSU University Stores to provide post-consumer recycled paper for use in on campus computer labs and photocopy machines. The high volume of printing and copying done within the library was instrumental in allowing the provision of recycled paper to be cost effective for the University Stores.

The earliest formal iteration of LEC received approval in 1990, creating the Recyclers of MSU Libraries committee. The committee's official charge was to educate library staff and to encourage recycling in the library. As recycling paper became more prevalent across the MSU campus, the committee broadened its focus to include conserving natural resources and eliminating waste related to paper and printing, electricity and energy use, heating and cooling, cleaning and office supplies, and transportation. The committee's charge also expanded to include a role advising library administration on environmental issues, educating staff, maintenance of reference materials related to the environment, and to liaise with other university units, such as the MSU Surplus Store and Recycling Center. These changes came into effect in 1998, along with a name change to Library Environmental Committee.

Since its inception, LEC has developed an active presence within the library. It employs a three pronged approach to engaging with staff, focusing on communication, education, and outreach. LEC regularly communicates with library staff through a monthly environmental email called the *Ecogram*. The *Ecogram* topics

vary, but they typically focus on practical ways to be environmentally friendly either at home or in the office.

LEC's educational activities consist of providing training for all new library employees. An environmental orientation provided by a LEC member is an official part of the new employee orientation protocol. New employees are briefed on recycling practices, energy conservation at the office, and other conservation and environmental issues. The goal is to remove potential roadblocks to conservation and recycling by providing new employees with an understanding of local practices. By minimizing confusion about green practices early on, new employees are more likely to participate in library conservation efforts (Kelly et al. 2006). The LEC member providing the orientation is available to answer any questions and new employees are encouraged to contact a LEC member with any concerns after the orientation.

LEC also organizes outreach activities both in and outside of the library. Each semester LEC arranges for speakers to participate in the Library Environmental Series. These speaking events are usually informational in nature and provide staff and students with an opportunity to learn about environmental matters both on campus and in the greater community. In addition to the Library Environmental Series, LEC has an ongoing relationship with the assistant curator of the Beal Botanical Garden (located directly west of the Main Library) to conduct educational tours of the garden. Library Environmental Series events and the Beal tours are scheduled at midday to allow staff to attend during the lunch hour.

In many respects, LEC was the pioneering environmental organization on campus that paved the way for other groups. The precursor to MSU Sustainability was the University Committee for a Sustainable Campus, which was approved by the academic governance committee in 1998 (DeLind and Link 2004). One of several key players in the formation of the University Committee for a Sustainable Campus, Terry Link, was longtime MSU librarian and also a founding member of LEC. Shortly after the formation of the University Committee for a Sustainable Campus, Mr. Link and other committee members successfully applied for a U.S. Environmental Protection Agency Sustainable Development Challenge Grant of nearly \$250,000 USD to form an Office of Campus Sustainability (OCS) and hire a program director to run the office (T. Link, personal communication, 11/25/2015). The OCS was formed in 2000, with Mr. Link named as the program director. Mr. Link instilled in the OCS similar principles as LEC and led the office for eight years. In 2014 the office changed its name to MSU Sustainability.

Other IPF departments related to sustainability, including the MSU Surplus Store and Recycling Center and MSU Bikes, all of which were formerly organized under MSU Sustainability, continue to work closely in tandem with the library on sustainable development projects. MSU Recycling manages the waste and recycling from every building on campus and also maintains a publicly accessible recycling drop off site. Recyclables are sorted in the materials recovery facility and baled for shipping to materials vendors. The recycling center handles cardboard, newspaper and office paper, glass, plastics, and most relevant to the library, books and journals

deaccessioned from the collection. MSU adheres to the philosophy of highest and best use, meaning they favor reuse and reduction over recycling with landfilling as a last resort (Michigan State University 2015a).

Also aligned to the highest and best use philosophy, the MSU Surplus Store accepts unwanted and used office supplies, electronics, computers, and furniture for refurbishing and reuse (Michigan State University 2015d). These items, together with recycling and composting, divert a significant portion of waste away from the landfill. MSU's current diversion rate of 57 % shows progress towards achieving the goal to divert 70 % of all waste on campus away from the landfill by 2017 (Michigan State University 2014). The MSU Surplus Store and Recycling Center share a joint facility in a Leadership in Energy and Environmental Design (LEED) Gold certified building on campus that features solar panels and water remediation among other green building features.

MSU Bikes operates a fully functional bicycle store on campus, providing new and used bicycles and accessories for sale, bicycle rentals, and repair and maintenance services to members of the MSU community. In addition to the store, MSU Bikes also advocates for bicycling as a means of transportation on campus and offers free classes on bicycle safety and bicycle commuting. Bicycle transportation on campus not only reduces greenhouse gases associated with travel, but also helps to mitigate the limited parking space available on campus (Toor and Havlick 2004). According to data from MSU Bikes, the total number of bicycles registered on MSU's campus has increased steadily from 4844 in 2006 to 8629 in 2013. Bicycles make commuting across MSU's large campus faster and more convenient for students, staff, and faculty alike and provides significant greenhouse gas savings over equivalent trips via automobile (Lindsay et al. 2011).

MSU Sustainability works to engage students, faculty, and staff on issues of sustainability. Students are encouraged to apply for research funding through the Be Spartan Green Student Project Fund. This fund gives MSU students an opportunity to plan and carryout sustainability related research projects up to \$5000 USD. The students are then able to utilize the campus as a laboratory in order to investigate practical means for advancing sustainable practices on campus. Outreach to faculty and staff takes place primarily through the EcoReps program. The EcoReps are a loose network of university staff and faculty members that model and encourage sustainable practices and serve as sustainability ambassadors for their units on campus (MSU Sustainability 2015). EcoReps serve a similar role as LEC within their units, and several LEC members also participate in the EcoReps program.

4 Collaborations

The shared history of LEC, MSU Sustainability, MSU Surplus Store and Recycling, and MSU Bikes has resulted in a number of collaborations between the groups. These collaborations include both daily operations and special projects. Daily operations include managing waste and recycling at the library and handling items

removed from the library collection. The groups' collaboration on special projects include a campus compost pilot program, the library staff bicycle, assistance with Earth Day outreach, and analysis of the library building's energy usage via a process known as building commissioning. Library operations and projects will be described in further detail in the subsequent sections with an emphasis on how they influence the library's sustainable processes.

5 Recycling and Waste Management

As a large institution in the middle of an active campus, the library generates a significant amount of both waste and recyclable or reusable materials. MSU Recycling supplies bins for recycling, the landfill, and most recently, for composting organic waste. MSU Recycling does not collect single stream recycling, and provides separate bins for recycling office paper (a higher quality paper that can be recycled into a larger number of new products), a lower quality mixed paper/paperboard, and combined plastics and metal. These bins, along with bins for landfill bound waste, are readily available in both staff offices and public areas and are collected by custodial staff and shipped for processing or sorting at the material recovery facility.

According to MSU Recycling data, during the 2015 calendar year the library generated a total of 131,892 lbs. of landfill versus 292,199 lbs. of materials diverted either through recycling or reuse programs. That results in a waste diversion rate of nearly 69 %, on track to matching the campus wide goal of 70 % by 2017.

While the library's diversion rate is progressing towards MSU's overall goal, there are still areas for improvement. A waste sort conducted in conjunction with MSU Recycling in December 2013 examined landfill waste taken from the Main Library. MSU Recycling set aside material collected from the library and 5 library staff members sorted the contents into two categories: recyclable and non-recyclable materials.

The total amount of material handled in the waste sort was 649 lbs. Of that total, 92 lbs. of materials were sorted into the recyclable category, revealing that slightly over 14 % of the material being sent to the landfill could potentially be recycled instead. Extrapolating that percentage to the entire body of landfill waste from 2015, as much as 18,696 lbs. of potentially recyclable materials could have been sent to the landfill from the library that year.

Additionally, landfill waste collected from office and staff areas had very little recyclable material contamination. The majority of recyclables found in landfill containers came from public areas with high student traffic, including the library café. This is consistent with the results of other studies that have found many undergraduate students lack clear understanding of the benefits of participating in sustainable activities (Kaplowitz et al. 2009) and remain unmotivated to make lifestyle changes (Eagle et al. 2015). Student engagement to encourage correctly sorting recyclables into the appropriate container is an area for improvement. The

successful sorting from staff areas, however, indicates that LEC's efforts to educate staff about sustainability and local recycling practice has successfully encouraged recycling and sorting waste, which is consistent with findings from Kelly et al. and Kaplowitz et al. (2006, 2009).

6 Composting Pilot

MSU has identified composting organic waste as the next step towards achieving the 70 % waste diversion goal (Michigan State University 2014). Composting not only reduces waste generation, but it also limits CO₂ emissions (Kranert et al. 2010). LEC and MSU Recycling have partnered on implementing a pilot program to collect compostable organic waste within the library. MSU Recycling representatives and LEC members collaborated to determine the optimal collection locations for bins and a satisfactory schedule for pickup. At the end of 2015, the library had 13 organic waste bins; 10 spread throughout various communal office spaces in the building and 3 dedicated to the library café, primarily to collect coffee grounds and food waste.

The library composting pilot launched in March of 2014 and has removed over 6444 lbs. of organic waste from the library's waste stream as of the end of 2015. The library was one of the first major buildings on campus to collect compost and has produced nearly half of the total compost collected across all participating buildings. The composting program is now successfully implemented in 18 academic buildings on the MSU campus and has collected a total of 13,801 lbs. of compostable material. MSU Recycling is able to further minimize the environmental impact of the composting program by conducting all of their pickups using a bicycle and trailer rather than a box truck. MSU Recycling began measuring the total distance traveled hauling compostable material by bicycle in September, 2015. Between September and December of 2015, hauling this material has resulted in traveling 235 miles by bicycle, which MSU Recycling calculated to result in a savings of 576 lbs. of CO₂ over using a box truck to travel a similar distance. Once collected, carbon material is mixed in with the organic waste, which then decomposes into finished compost. The finished compost is available for purchase at the Surplus Store.

7 Library Materials

MSU Surplus Store and the library work together to either reuse or recycle 100 % of the material withdrawn from the library collection. Reuse is the highest priority as that has the greatest environmental benefit (Thomas 2011). Deaccessioned volumes are removed from the shelves and processed for removal from the catalog before being loaded into hampers for collection. Surplus Store employees pick up

the hampers and transport them to the recycling center, where significant time and resources go into ensuring each item receives consideration for reuse.

Each item is scanned using the International Standard Book Number (ISBN) in order to determine its value. Higher value items are posted for sale online while low value items are sold in bulk at the Surplus Store. Items that were found to have no resale value are first available for donation. Organizations that have received donations of printed materials from the Surplus Store include local schools, prisons through the State of Michigan Department of Corrections, and Better World Books, a company that promotes reusing books through their own network of sales and international donations for education (Better World Books 2015). Books that are not donated are debound using the recycling center's hydraulic debinding machine, which cuts the pages to separate them from the book spine and binding. The pages and covers are then added to the paper and paperboard recycling, respectively. All MSU Library materials processed by MSU Recycling are either reused or recycled; no materials are sent to the landfill or incinerated.

The MSU Surplus Store and Recycling Center processes a significant amount of print materials each year. During the 2013–2014 fiscal year the library generated 53,052 lbs. of materials, while the community drop off site collected 89,810 lbs. During that same timeframe, book sales totaled \$151,559.68 (all amounts in USD). The bulks sales from the on-campus Surplus Store produced \$75,790.62 from 29,096 items sold, while the online sales generated \$75,769.06 from 5100 items sold. According to calculations using the Environmental Protection Agency's Waste Reduction Model (WaRM), reusing these materials saved the equivalent of 621 tons of CO₂ emissions (2014). Similarly, by recycling the over 89 tons of paper and paperboard from the debound materials, the Recycling Center was able to reduce greenhouse gas emissions by the equivalent of 305 tons of CO₂.

8 Transportation

In late 2014, LEC and MSU Bikes launched a collaboration to provide a bicycle for use by library staff. LEC has arranged for the library to lease the bicycle from MSU Bikes on an annual basis. Along with the bicycle, the lease includes front and rear lights, fenders, a warning bell, and a U-lock with mount. MSU Bikes provides any necessary adjustments or maintenance for the bicycle or accessories as part of the lease agreement. The bicycle is available for library staff and faculty to use on official library business around campus. LEC produced the required documentation for utilizing the bicycle, including the policies and procedures for use, the agreement for use, and a theft/damage/maintenance form in addition to materials promoting the bicycle to staff for use.

When not in use, the bicycle is securely stored in a locked closet near the circulation desk. Reservations are required for use of the bicycle and can be made on the staff shared online calendar. Staff members inform the circulation desk staff of the reservation and the bicycle is then checked out for use. All staff members

must provide their own helmet before receiving the bicycle and agree to follow campus bicycle ordinances as per the user agreement. As of the end of 2015 (slightly over one calendar year after the start of the program) the bicycle has been used 20 times, according to library circulation statistics. While this is an admittedly small total, the bicycle program is still in its developmental phase and LEC expects it will increase in use among library staff.

9 Energy Use

In 2012, MSU developed an Energy Transition Plan with the long-term goal being 100 % renewable energy on campus (2012). The first steps towards this goal outlined in the plan were to transition the power source at the on-campus T.B. Simon Power Plant from coal to natural gas. MSU also set targets for incremental increases in renewable energy and reductions in greenhouse gas emissions. An important part of the strategy for reducing emissions has been to improve the efficiency of buildings on campus, including the library.

As an older public building open 24 h and housing over 500 public computers, energy use at the library is consistently high (Arnold 2015). The library not only must maintain lights and heat for nonstop use, but very specific environmental conditions must also be maintained in order to provide optimal conditions for preserving the physical collection (Linden et al. 2012). Even so, energy use within the library is generally declining according to the MSU Energy Dashboard campus monitoring tool. The library's energy use declined from 195 thousand British Thermal Units per gross square foot (kBtu/gsf) in 2008 to only 48 kBtu/gsf in 2015 (Michigan State University 2015b). These energy savings can be traced back to several facility efficiency upgrades. During this time period, IPF staff partnered with library facility staff to install new and efficient air conditioning chillers, replace a subbasement electronic transformer with a more efficient model, convert select lighting fixtures and ballast units to LED, and install occupancy sensors to automatically shut off lighting in unused areas of the library (J. Hensley, personal communication, 01/13/2016). Additionally, the library held a series of seminars in the spring of 2014 for staff on reducing energy consumption. These seminars were led by an IPF Energy Educator and focused on practical ways that individuals can reduce energy use while working in the library.

The library is building on these successful energy reduction projects and is currently engaged in an opportunity to further reduce its energy consumption through the IPF Building Commissioning program. Building Commissioning is a process by which a building is analyzed for operations, functionality, and efficiency. The assessment was conducted in 2014 and the report included recommendations for improvements to the lighting and HVAC systems and improving the building envelope. Recommended projects include projections on savings in both

energy use (measured in one million British Thermal Units (MMBTU)) and US dollars. A return on investment (ROI) estimation in years is also included in the recommendation report. MSU administration has approved funding for one recommended project in 2016 to upgrade the lighting system in the Main Library's East Wing. The energy savings from this project are estimated to be 3397 MMBTU with a ROI of 6.6 years. Additional projects will be considered for funding by the university in future years and provide opportunities for further energy reduction.

10 Lessons Learned

Sustainable development at MSU and in the library continues to be an ever evolving process, and lessons learned from past experiences can inform sustainability performance into the future. Successes at the MSU library include efforts to reduce waste among library staff, the 100 % diversion rate for materials deaccessioned from the collection, composting organic waste in the library, and building upgrades to reduce energy consumption. The gap between staff and student participation in engaging in sustainability activities is a primary challenge facing sustainability at the MSU Library. This is compounded by the fact that new student cohorts matriculate every year, resulting in a recurring need for sustainability education on campus. Improvements in student education, signage, and communication should result in improvements in overall recycling and composting rates among students (Kelly et al. 2006; Sussman et al. 2013), but that will continue to be an ongoing process.

Any library looking to develop a similar sustainability program must also confront the question of cost, which manifests itself in several ways. Costs for upgrading energy using systems within a single building like the Main Library are fairly straightforward, and have the potential to pay for themselves over time with reduced utility payments. These types of projects also have some of the largest impacts on energy use, yet they also require significant upfront support. Other costs include paying salaries and operating costs to handle and sort the materials withdrawn from the library collection. Strong institutional support for sustainability initiatives from within IPF, MSU, and library administrations is crucial to overcoming these costs associated with pursuing sustainable development.

11 Conclusion

LEC and the library have benefited greatly from the institutional support provided by MSU Sustainability, MSU Surplus Store and Recycling Center, and MSU Bikes. The intertwined history of the MSU Library and MSU Sustainability has led to a long and fruitful partnership between the organizations. Collaborations between university units demonstrate a commitment to the process of developing a resilient

and sustainable campus now and into the future. Many of the programs described in this chapter could be replicated in libraries at other institutions as a template for sustainable development in academic libraries.

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