

Shields Library Engagement Project

ABT 212: Path to Zero Net Energy

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Table of Contents

Project Background	2
Project Context	2
Problem Description	2
Literature Review Findings	2
Methodology	4
Considerations, Constraints, and Assumptions	4
Procedure	4
Results and Discussion	5
Recommended Outreach Strategies	5
Sources of Uncertainty	7
Follow On Work	8
Conclusion	9
References	10
Appendix 1 - Proposed Outreach Strategies	A1

Project Background

Project Context

The Energy Conservation Office (ECO) has provided extensive support throughout the Shields Library's LEED certification process. An ongoing HVAC scheduling project with the objective of avoiding energy waste inside the library has served as a significant factor within the LEED certification project. Due to the library being centrally located and accessible to the greater campus community, this presents an opportunity for the development of educational endeavors focused on green building projects, energy efficiency, and sustainability. With this in mind, the goal of this project was to develop outreach strategies intended for the greater campus community and centered on the Shields Library under the direction of the ECO Energy Feedback Team.

Problem Description

The strategies must be constructed in a way that is understandable to the general public while being engaging and interesting. In order to ensure an effective transfer of information, the outreach strategies must address challenges in quantifying educational benefits and creating community buy-in to garner greater participation. These concerns have been summarized into the following problem statement:

“Communicating HVAC scheduling improvements through educational outreach opportunities.”

Literature Review Findings

To inform the development of the recommended outreach strategies, a literature review was conducted to assess similar examples from other projects. Given the broad nature of this topic, the literature review included research within the topics of Building Energy Efficiency and Campus Outreach Strategies each of which are described in additional detail below.

Key findings from the Building Energy Efficiency portion of the literature review included the importance of understanding the economic implications of energy improvements, considerations for dealing with older buildings, and obtaining student feedback as part of implemented projects. As an example, results from one study indicated that understanding economic implications of energy improvements can promote accurate communication to a broad audience (Alanne et al 2013).

In regards to the Campus Outreach portion of the literature review, key findings consisted of the importance of planning prior to implementing campus outreach as well as facilitating outreach strategies that promote student interaction. As an example, one study cited that “planning is the

key to outreach success” and “interaction can establish relationships which improve perceptions of the library and its services” (Vann 2013).

The literature review also included performing an assessment of outreach strategies from other universities that could be adopted as part of the Shields Library Engagement Project. One example is the Multimedia recording room at the University at Buffalo Library. In an effort to mitigate declining student traffic in the library while revitalizing underutilized space, the University at Buffalo implemented a Multimedia recording room where students can record videos as part of class presentations or outreach for campus organizations. The multimedia recording room is shown in Figure 1.

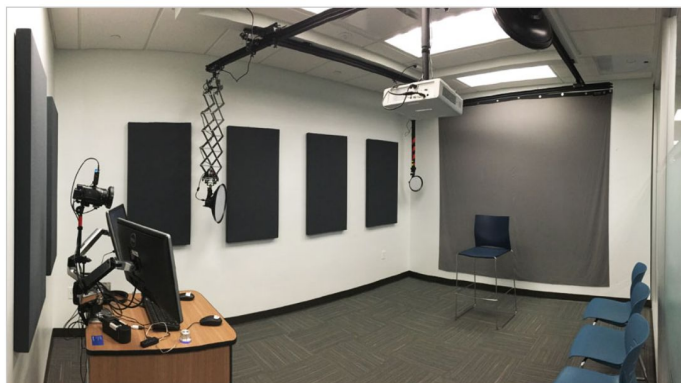


Figure 1. University of Buffalo Multimedia Room (Source: UB 2020)

Another case study consisted of the education mural within the Centennial Centre for Interdisciplinary Science (CCIS) Building at the University of Alberta. The CCIS Building was built in 2011 and is a LEED certified building with lecture halls, laboratories, and conference rooms. To educate students about sustainability and interdisciplinary collaboration, the walls of the building include murals with information about sustainability measures including energy usage, building materials, and reduction of water use. The mural is shown in Figure 2.



Figure 2. University of Alberta CCIS Mural (Source: UA 2020)

Methodology

Considerations, Constraints, and Assumptions

The direction of the project was motivated by a few key considerations. An initial consideration was the necessity to balance the best interests of personnel from both the library and the ECO staff. To gain an accurate idea of the work to be accomplished, meetings were held between the green building student interns working to support the library's LEED certification with ECO, Shields Library staff, ECO Communication Interns, and members of the Active Commissioning Enterprise. Discussion points in each of these meetings included previous work done to facilitate campus outreach by both ECO and the library staff as well as the outcomes and takeaways associated with those efforts.

Another consideration was determining how to incorporate the intricacies of the LEED certification process into the outreach strategies in a way that would not be overwhelming to the audience. Additionally, a variety of outreach strategies were considered (i.e. on-campus, virtual, singular events, a series of events) for a wider range of options. There were no constraints placed on the outreach strategies themselves as both parties were open to all proposed strategies. Additionally, throughout this project it was assumed that the strategies would not be enacted during the quarter of development (i.e. Spring Quarter 2020) but would instead be put into place in the future.

Procedure

The project was split into three phases. These included planning, development, and finalization. The planning phase began with the formulation of the Project Plan based on initial communications with the Shields and ECO staff. The development phase consisted of determining the research direction of the project, confirming and defining the project scope, and obtaining references that detailed effective energy related communication strategies pursued by other campuses. This was followed by additional meetings to refine the proposed outreach strategies using the clients' feedback. This also served as an opportunity to learn about other active projects both within the library and elsewhere on campus that could be shared using the library communication strategies as a vehicle. An overview of the work breakdown structure is shown in Figure 3.

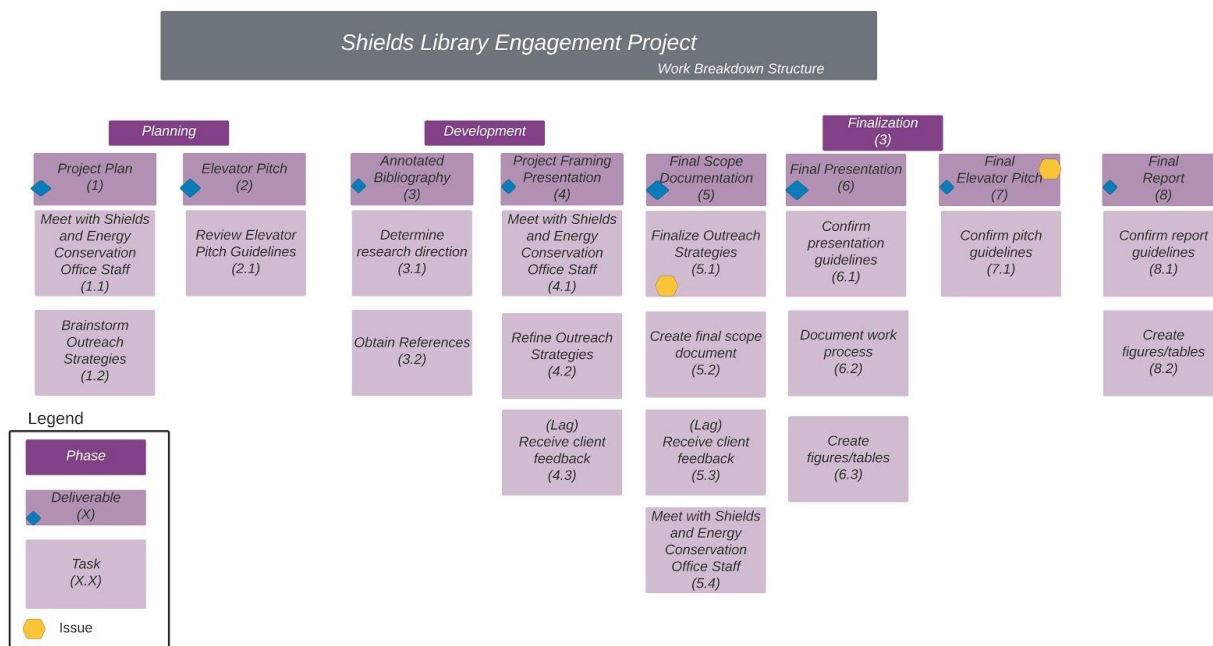


Figure 3. Work Breakdown Structure

Results and Discussion

Recommended Outreach Strategies

To satisfy the client's objectives of implementing interactive and educational outreach strategies that promote increased usage of ECO platforms, six outreach strategies were developed. The outreach strategies include both in person and virtual participation to facilitate interaction with students in both formats. The in person outreach strategies were developed with the intention that these activities would take place within Shields Library to promote student traffic within the building. The recommended outreach strategies are shown in Figure 4 and are described in detail within Appendix 1.

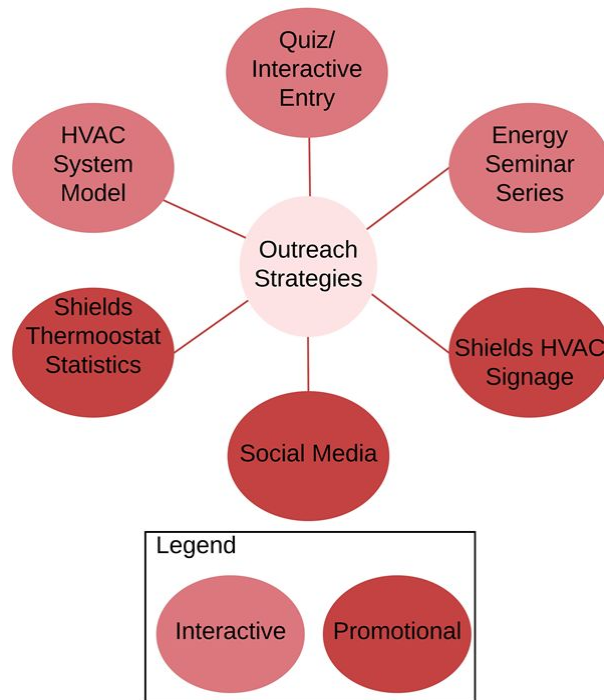


Figure 4. Recommended Outreach Strategies

To promote flexible implementation, the outreach strategies include a range of potential timeframes. Depending on the specific strategy, timeframes can be a single day, multi-day, or variable. The range of timeframes will allow for the outreach strategies to impact the greatest number of people as students and faculty have variable schedules. An overview of the timeframes for the outreach strategies is shown in Figure 5.

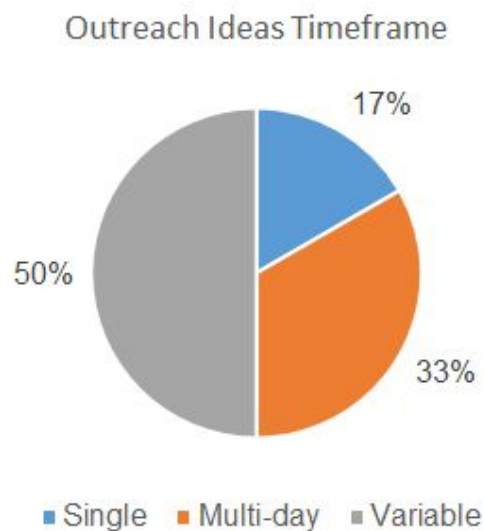


Figure 5. Timeframe for Outreach Strategies

Because one of the key objectives of the outreach strategies is to promote increased usage of several ECO platforms, establishing metrics is one way to measure this goal. Based on the recommended outreach strategies, there are several metrics that can be measured. As an example, a 20% increase within a month of outreach strategy implementation on ECO's social media presence 'UCDavisJoules' is one potential metric. Another metric could be 10 additional Thermoostat votes for Shields Library compared to the previous year's number of votes following implementation of an outreach strategy.

Sources of Uncertainty

There are several sources of uncertainty that have the potential to influence the implementation of the recommended outreach strategies. These include the instruction format for the 2020-2021 academic year, composition of Shields Library visitors, and baseline metrics for the outreach strategies.

- **Instruction Format for 2020-2021 Academic Year:** Depending on UC Davis's determination of the instruction format for the 2020-2021 academic year (i.e., in person, virtual, or hybrid instruction), some of the timeframes for the recommended outreach strategies may need to be adjusted.
- **Composition of Shields Library Visitors:** The recommended outreach strategies consist of educational components that can be applied to both students and faculty. While in person outreach strategies can be held within Shields Library, it is unknown whether the intention is for these strategies to promote additional foot traffic within the building. The team is unaware of the composition of Shields Library visitors (i.e., number of student visitors vs. number of faculty visitors)
- **Baseline metrics:** As discussed in the Recommended Outreach Strategies section, collecting baseline metrics will be a helpful way to assess the effectiveness of the strategies. While some potential quantities for metrics were presented in that section, accurate quantities will be dependent upon actual data from the respective platforms.

Follow On Work

To facilitate continuity of the work performed to date, suggested follow on work consists of five steps which are shown in Figure 6 and described in more detail below.

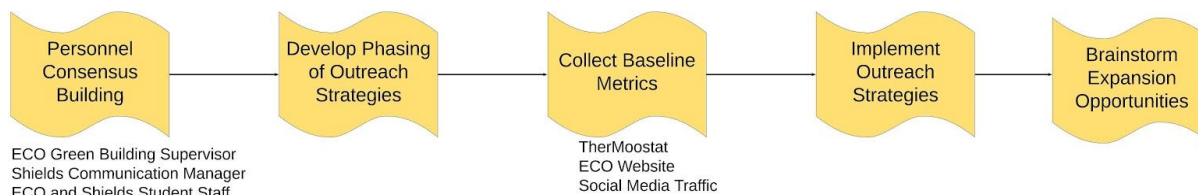


Figure 6. Recommended Follow On Work

The first step of follow on work consists of building consensus among personnel including the ECO Green Building Supervisor, the Shields Communication Manager, and both ECO and Shields Library student staff. The ECO Green Building Supervisor, the staff person providing oversight to the LEED Certification Process for Shields Library, was on maternity leave for the duration of Spring Quarter 2020. Given the ECO Green Building Supervisor's historical involvement with this project, getting her input on the recommended outreach strategies will be important. Similar coordination is recommended with the Shields Library Communication Manager to confirm that the proposed outreach strategies are in alignment with proposed communication initiatives within the Library. Additionally, several of the proposed outreach strategies involve facilitation by both ECO and Shields Library student staff therefore their input will be valuable as well.

The second step of follow on work will consist of developing phasing of the outreach strategies. While the outreach strategies described in Appendix 1 include recommended timeframes, it might be good to establish potential dates based on anticipated events during the 2020-2021 academic year. Establishing potential dates will aid in a coordination standpoint as both staff from ECO and Shields Library will play a role in implementing the recommended outreach strategies.

After developing a phasing plan for the outreach strategies, collecting baseline metrics is recommended. The outreach strategies were developed in mind to have the ability to promote increased usage of ECO platforms such as TherMoostat, the ECO website, and social media channels. To effectively determine whether these platforms are experiencing more traffic, baseline metrics should be collected prior to implementing the outreach strategies. Examples of baseline metrics include: determining the number of TherMoostat entries that are specific to Shields Library within a four week period or measuring the number of average likes for "Joules the Cow" (ECO) social media posts over the course of a week.

Following the consensus building, phasing, and baseline metrics collection, the outreach strategies can be implemented. The implementation stage will present an opportunity to make note of potential improvements for subsequent outreach strategies. The characteristics, timelines, or materials within the Shields Library outreach strategies may be applicable to other outreach initiatives on campus. To maximize the opportunity for knowledge sharing between campus departments, it might be good to brainstorm potential expansion opportunities for these outreach strategies in the broader campus community.

Conclusion

The main takeaways from this project include the significance of collaboration in education as well as the importance of communicating to a non-technical audience. Initiatives centered around campus outreach are most effective when multiple parties collaborate in a mutually beneficial manner. Not only does this allow for a larger presence and an increase in participation, but it also supports the inclusion of diverse groups within the greater campus community. Both energy efficiency and sustainability are integral in improving our way of life. With the strategies in mind, these concepts can be made further accessible and relevant to campus life.

References

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Appendix 1 - Proposed Outreach Strategies

Table 1. Summary of Outreach Strategies

Interactive		Promotional	
HVAC System Model	Educational model of HVAC fundamentals with an overview of HVAC scheduling improvements	Shields Thermostat Statistics	Advertisement of recent Thermostat statistics using existing Shields LCD Screens
Quiz/ Interactive Entry	A series of questions consisting of fast facts about Shields Library	Social Media	Highlighting energy efficiency improvements within the library
Energy Seminar Series	Collaboration between the Energy Efficiency Institute and other campus organizations	Shields HVAC Signage	Text write-ups to emphasize the significance of HVAC components

HVAC System Model

- Format: In person
- Time Period
 - Multi-day (3 days) tabling event in Shields lobby that educates students on HVAC fundamentals, thermal comfort, and provides an overview of HVAC scheduling improvements in Shields Library.
 - Either perform within first 3 weeks of quarter or in conjunction with Energy Efficiency Day (Oct 7, 2020), National Green Week (anytime between Feb and April)
 - Adjacent easel display contains information about [Thermostat](#)/Campus Comfort ([Seasonal](#), [Broken Equipment](#), and [Seating Location](#)). As well as Thermostat Summary for Shields ([2016-2018](#))
- Materials:
 - Existing HVAC Model
 - Laptop
 - Easel
 - Printouts/adaptations of links referenced above
- Participants: ECO Interns (Communication/Energy) & Shields Student Employees



Photo: [HVAC Model](#) (Courtesy of ECO)

Shields HVAC Signage

- Format: In person (within salad bar)
- Time Period
 - 3 weeks
- Materials:
 - Shields 'Salad Bar' Display
 - Shields HVAC Component Photos (Mechanical Room or otherwise)
 - Text write ups of the significance of the respective components
- Participants:
 - Shields Staff/Student Employees
 - ECO Interns
- Example(s): University of Alberta CCIS Interpretative Signage



Photo: Univ of Alberta [CCIS](#) (Courtesy of ECO)



Photo: Shields Outside Air Dampers (Courtesy of [ECO](#))

“Proper modulations of these dampers are important for the economizer operation and for meeting ventilation requirements.”



Photo: Chiller for Shields Rare Books Collection (Courtesy of [ECO](#))

“Storing rare books at the proper temperature helps keep the historical materials in excellent condition.”

Quiz/Interactive Entry

- Format: In person
- Time Period
 - 1 day (can be in conjunction with other events on a recurring basis)
- Materials:
 - Quiz (5 questions - consisting of fast facts about Shields Library)
 - Shields Library was built in how many phases? (5)
 - In a 2019 waste audit of the 24 hour study room, what percentage of waste consisted of compostable food/liquid? (44%)
 - Interactive Entry (what suggested energy efficiency initiatives do you have?)
 - Electronically via Thermostat Comment Field
 - Or if within Shields, can use an available white board
- Participants:
 - ECO Communications Interns
 - Shields Student Employees

Menu

3 of 3: Comments



Shields Library: Room 2nd floor, east side
clothing: normal
inactive

Any comments to add?

Your comments help us determine the comfort and energy issues in your space.

Questions About Campus Buildings

Choose how satisfied you are with temperatures on campus:

☐ dissatisfied ☐ neutral ☐ satisfied



Are you willing to vote for a slight change in thermostat settings on campus in order to save energy?

☐ No, I'm not willing ☐ Yes, I'm willing

☐ Please send me an email confirmation.

Submit my feedback!

Photo: [Thermostat](#) Comment Field

Social Media

- Format: Online
- Time Period:
 - Can be a year-long initiative and/or a part of a social media challenge (#ShieldsSustainability)
 - This can be used to highlight multiple energy efficiency improvements to the library (i.e. one per week)
 - Challenge students/organizations to a photo contest (can be held within a week)
 - Scavenger hunt in the library (incorporate fun facts about the library related to energy)
- Materials:
 - Social Media Accounts (e.g. Twitter, Instagram, Snapchat, Youtube)
- Participants:
 - ECO Interns/Staff
 - Shields Students/Staff
- Examples:
 - Cal Poly Pomona: Maximizing Engineering Potential
 - Students take photos that match a specific theme/idea
 - Prize given to the team with the best photo
 - ECO “Metaphors with Veronica” (Instagram)

Energy Seminar/Series

- Format: Online/In-Person
- Time Period:
 - This depends on the number/frequency of seminars held
 - Can be held on significant days (e.g. Energy Efficiency Day, Earth Day, National Green Week)
 - Case study of the library?
- Materials: Presentation
- Participants:
 - Energy and Efficiency Institute (UC Davis)
 - This may be an opportunity for them to further highlight campus improvements (each seminar covers a different topic and uses a campus improvement as a basis for observation)
 - On-campus environmental organizations
- Examples:
 - University of Buffalo (UB)
 - UB Arts & Humanities Team librarians outreach for traditional collections/introduction of services for users
 - One-year series of events to introduce library resources and engage wider audience/instill community ownership in collaboration with university partners
 - Central theme consisting of four program areas:
 - Library exhibits
 - Book talks
 - Multi-media exhibit kiosks
 - Co-planned TA workshops
 - “Multiple Outreach Models for Library Outreach Initiatives”

Shields Thermostat Statistics

- Format: In-Person
- Time Period:
 - Variable (1 week) - can be done periodically throughout the quarter
- Materials:
 - LCD Screen in Shields Library Lobby
 - Recent Thermostat statistics
 - Advertisement Powerpoint slide (to be confirmed)
- Participants:
 - Shields Student Employees/Staff (whomever prepares the advertisement powerpoints)
 - ECO Interns
- Examples: existing Shields LCD Screen Advertisements

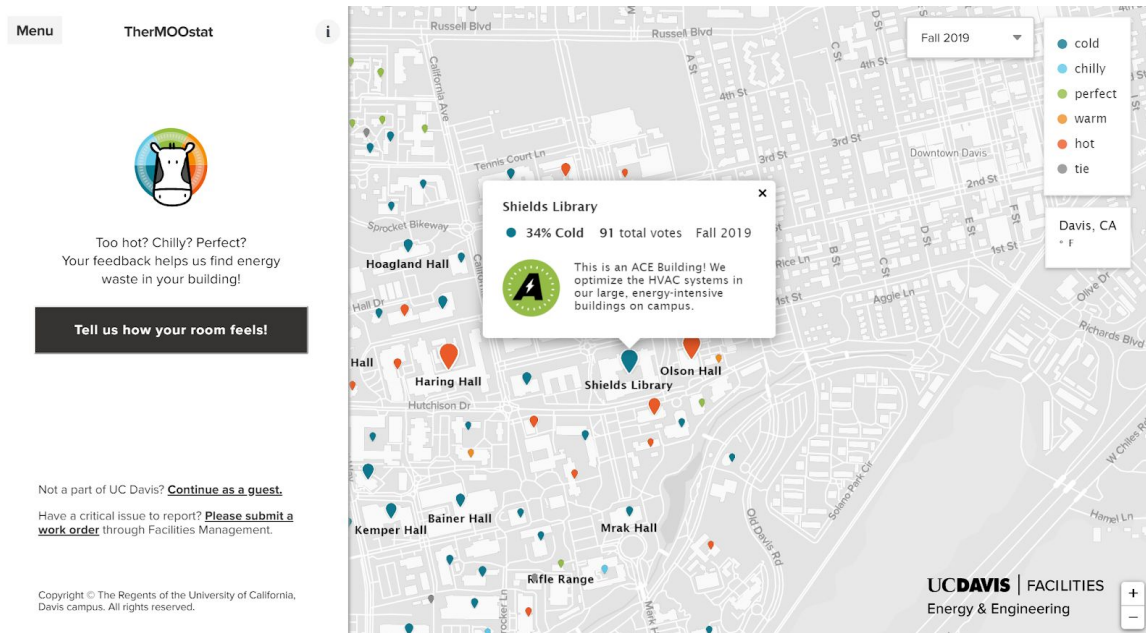


Photo: [Thermostat](#)