Senior Project: Sustainable Living Edu

Annika Furr

Graphic Communication Department, Cal Poly SLO

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Professor Hocheol Yang

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I. Introduction
For my senior project, I created a virtual sustainability training program called ‘Sustainable Living Edu’ for students and employees at Cal Poly SLO. There is a lack of environmental literacy at Cal Poly and other campuses in the California State University (CSU) System. Sustainable Living Edu will educate students and employees at Cal Poly about what sustainability is and how to apply sustainable practices into their daily routines.

II. Purpose

Implementing a sustainability-focused training program is incredibly important to the betterment of our campus and the CSU System as a whole. First, Sustainable Living Edu can help to improve Cal Poly’s AASHE STARS rating. The AASHE STARS rating “is a transparent, self-reporting framework for colleges and universities to measure their sustainability performance” (*Stars, Sustainability Tracking Assessment & Rating System*, 2021). Cal Poly’s 2019 STARS rating fell short in the categories of Sustainability Literacy Assessments and Sustainable Culture. Sustainable Living Edu will help our campus community improve in these areas specifically. Secondly, local and state governments constantly enact new environmental laws and waste sorting guidelines. As an institution of higher education, Cal Poly is responsible for educating the campus community on these laws and regulations. For instance, enacted in January 2022, “SB 1383 establishes statewide targets to reduce the amount of organic waste disposal in landfills” (*City of Corona*), requiring all households and businesses to compost by January 2024. Cal Poly comprises a significant portion of the San Luis Obispo population. Proper sorting within our campus community, a topic that is covered extensively in Sustainable Living Edu, can help to ensure San Luis Obispo’s compliance with SB 1383. Third, according to the Cal Poly Sustainability Learning Objectives (*University Learning Objectives*), all graduates of the University should be able to:

1. Define and apply sustainability principles within their academic programs,
2. Explain how natural, economic, and social systems interact to foster or prevent sustainability,

3. Analyze and explain local, national, and global sustainability using a multidisciplinary approach, and

4. Consider sustainability principles while developing personal and professional values.

Sustainable Living Edu is built strategically around these four Sustainability Learning Objectives. There is great value in educating our pupils on such topics during college. Garcia states that doing so “employs a long-term outlook that recognizes that the alumni will become the decision-makers in their homes, industries, schools, and governments... by knowing the impact of their actions (and inactions) on the environment, society, and future generations” (2005). Finally, improved environmental literacy leads to more awareness, conservation efforts, and support for new subsidies, grants, and fundraising initiatives. Additionally, these efforts can massively decrease costs, such as garbage disposal and University Housing utilities.

**III. Procedures**

Over Summer 2022, I conducted preliminary research on various educational platforms and compliance requirements for a campus-wide training program. Until Fall Quarter 2022, a full script and outline of the training were produced by myself, Cal Poly Green Campus Team, and various students from the EDES 408 class. This script was reviewed by various stakeholders including Cal Poly Sustainability staff in the first month of Fall Quarter 2022, and then it was revised based on their comments. The deliverable of my senior project is a digital, user-friendly training demonstrating strong skills in Graphic Communication that improves environmental literacy within our institution and hopefully others beyond that. This project was filmed in the Cal Poly GRC Studio, starring several students from the Cal Poly Theatre Arts major. All editing
was conducted throughout the remainder of the Fall Quarter 2022 through Adobe Premiere Pro, VideoScribe, Microsoft Stream, and Adobe Illustrator.

Figure 1: Set up of equipment for filming at Cal Poly GRC Studio

Figure 2: Introduction video of Sustainable Living Edu, starring Natalie Rathle
Once the final product was imported into the Articulate Rise platform in early December 2022, I ran expert reviews and surveying of the completed product amongst professors in the Cal Poly Graphic Communication Department, Cal Poly Green Campus Team, Cal Poly Sustainability staff, and students in the Fall 2022 GRC 461 class. All of these individuals were involved with the creation of the training in some aspect. To measure the training program's impact, these individuals also took a pre-assessment and post-assessment (AKA the Final Quiz) that tested their knowledge before and after completing the training, as well as a short survey to provide feedback on the accessibility and user-friendliness of the platform. The Final Quiz is derived from the Sustainability Catalog Knowledge Assessment, a survey study done for the Cal Poly Sustainability Initiative (Sustainability Catalog). This process also allows for the assessment results to be compared with those from years before the creation of the training. After implementing feedback from these reviews, the training was exported from Articulate Rise by Jeff Williams, Learning Technology Specialist at Cal Poly, in the SCORM format to Cal Poly’s LMS. A link to the training will be added to the Sustainable Living Edu Instagram and the Cal Poly website at a minimum, per precursory approval from the Cal Poly Dean of Students, Joy Pederson. Green Campus Team and College Core will continue to investigate additional Cal Poly platforms where the training link can potentially be posted and marketed for, so it can become as
accessible as possible to Cal Poly students and employees. As for making this resource a mandated training for Cal Poly students and faculty, approval to do so will need to go through both the Office of the President and the CSU Chancellor’s Office.

IV. Literature Review

A. Usability and User Experience

While the terms usability and user experience (UX) are often used interchangeably, the key difference between the two comes from usability being more results oriented while UX entails a more extensive evaluation of the interaction. Specifically, Tullis advises that usability is “the ability of the user to use the thing to carry out a task successfully, whereas user experience takes a broader view, looking at the individual’s entire interaction with the [product], as well as thoughts, feelings, and perceptions that result from that interaction” (2013). Moreover, a UX metric considers the effectiveness, efficiency, and satisfaction of the user in their interaction with the product (Tullis, 2013). In the ever-evolving world we live in, strong user experience is more important than ever as these complex technologies will only become more difficult to use (Tullis, 2013), whether that is in school or work environments.

B. Factors and Trends

Over the past three years, virtual learning has become a new normal as a result of the COVID-19 Pandemic, making usability and UX vital for the advancement of ourselves and our digital world in an educational context. Before revealing the different factors and trends that play into creating an educational resource with strong usability and UX, we must first define some key terms. As mentioned previously, in recent years E-learning has been at an all-time high. Althobaiti discusses how, among many formats, E-learning can be done through the Internet, software, electronic media, and broadcasts (2016). Given that other mandatory Cal Poly training programs have been done in virtual formats, an online resource is the best method for
Sustainable Living Edu. Learning Management Systems (LMSs) are powerful tools for E-learning, as they can be utilized to “manage teaching and learning activities and to integrate learning services to facilitate the procedures of both teaching and learning” (Althobaiti, 2016). Sustainable Living Edu uses software called Rise 360 by Articulate, which allows the training to be compiled and exported in a format that is compatible with Cal Poly’s most widely used LMSs.

In a UX study done on an LMS used for higher education in Saudi Arabia, the system was evaluated in the following nine categories to measure success: “content, learning and support, visual design, navigation, accessibility, interactivity, self-assessment, learnability, and motivation” (Althobaiti, 2016). Their study not only used common evaluation strategies such as surveys and interviews, but also more complex, highly technological methods like eye-tracking and annotations of multimodal behavior (Althobaiti, 2016). As portrayed in this study, while very important, UX assessments involve much more than just ADA or branding compliance.

According to Dringus, some signs of poor usability to also be aware of include:

- “Functionality that requires an undesired decision or response...
- The labor-intensive design that is pervasive in most LMSs...
- Functionality that only works part of the time...
- [and] Some to no flexibility” (2006).

The UX, usability, and learnability of Sustainable Living Edu overall was evaluated using a quiz that the user completed both at the beginning (as a benchmark) and end of the training program. This assessment will reveal the extent to which completing the training helped the user to absorb and retain the content.
While choosing an LMS that corresponds well to the needs of a project is very important, incorporating strong visual design principles is also very necessary in producing a resource with strong usability and UX. Bouchrika suggests that there are “three fundamentals of design: design objects, design principles, and design properties” (2018). Moreover, design objects are graphics explaining an idea or concept, design principles are the arrangement of design objects to demonstrate interactions or relationships (e.g. unity, hierarchy, contrast), and design properties are design characteristics that can be modified (e.g. form, typography) (Bouchrika, 2018). The application of these design fundamentals were useful in the creation of Sustainable Living Edu, including video editing and the design of graphics/motion graphics. Additionally, Figure 1 is a helpful workflow to utilize in a project like this, particularly the “theory application”, “use fundamentals”, “alter properties”, and “refine media” steps (Bouchrika, 2018).

![Visual Design Process in Online Learning Design Studio (Bouchrika, 2018)](image)

One final factor that can majorly deter usability and learnability if done poorly is providing too much information at once to the audience, to the point that none of the content can be retained. This can occur in the realm of both visual and structural/layout design, as even too many colors or fonts within graphics can become overwhelming for the viewer. As stated by Bouchrika, “The Online Course Workshop... suggests that ‘talking too much or doing too much’ and ‘assuming students should know that’ are some of the worst things teachers can do” (2018).
This was a major factor I had to consider when editing the script because while I wanted to provide all the content that I could, I had to limit it so that what was included would stick, especially to an audience who may not have any background knowledge in sustainability-related topics beforehand. To help with this issue, any information that I felt was important but was too much to be included in the script of Sustainable Living Edu is listed in an optional Resources section at the end of the training.

Figure 5: Resources section of Sustainable Living Edu

**C. Benefits**

Strong UX and usability contributed to the learnability and overall quality of the project. As mentioned previously, successful implementation of this project can improve Cal Poly’s AASHE STARS rating, contribute to San Luis Obispo’s abidance with SB 1383, help graduates to fulfill Cal Poly’s Sustainability Learning Objectives before entering their adult lives, and spread environmental awareness. Tullis emphasizes that UX metrics can also reveal a return on investment (2013), such as reducing garbage disposal and University Housing utility costs for Cal Poly.
D. Summary

In conclusion, while usability and UX are very much interrelated, both graphic communication theories are incredibly necessary to the effectiveness and learnability of E-learning platforms, such as Sustainable Living Edu. With special attention paid to these theories, the easier it will be for users to absorb and retain the information provided in the training, allowing them to become environmental stewards now and in their future adult lives.

V. Results

The completed project is a brief yet effective 30-minute online training program that includes videos, graphics, readings, activities, reflection questions, multiple-choice assessments, and helpful resources and links.

Figure 6: Waste Management reading section of Sustainable Living Edu

The training covers several topics, including but not limited to consumption and fossil fuels, water, transportation, and waste management. The training is available to all students and staff through Cal Poly’s Learning Management System (LMS). The training also follows Cal Poly Branding Guidelines and is fully ADA-compliant (Americans with Disabilities Act). The ADA “[ensures] that individuals with a disability have access to places of learning” and are “not be denied access simply because they have a disability” (Gordon, 2000). The training can be
accessed at this link. There is also a social media page for the training on Instagram, with the handle @poly4planet.

![Sustainable Living Edu official logo](image)

Figure 7: Sustainable Living Edu official logo

Additionally, all assets for the training, including video clips, branding guidelines, and more have been shared with Cal Poly Learn and Grow, Jeff Williams (Learning Technology Specialist), Kylee Singh (Sustainability Coordinator, Facilities), and Kalea Conrad (Co-Project Lead of Sustainable Living Edu and member of Green Campus Team) in the case that they might be needed in the future.

**VI. Reflection and Limitations**

Overall, I am very pleased not only with how the training came out visually, but also with the level of learning which the users were able to achieve through completing Sustainable Living Edu. The quiz results supported the hypothesis that completing the training would help to improve their environmental literacy. In addition, I received both positive feedback and suggestions for improvement in my peer and expert reviews that revealed to me how I could continue to enhance the quality of the training in the final days of editing in Premiere Pro and Articulate Rise. My expert reviewers were professors Hocheol Yang and Kenneth Macro, and my peer reviewers were Lauren Wagner and Abby Fahey, all from the Cal Poly Graphic Communication Department. While their feedback was positive overall, they did give a few suggestions to bring the training to the next level. To summarize, they recommended to:

- perfect the timing of the closed captions,
- improve the audio quality,
• make the open-ended reflection questions at the end of each lesson return a neutral response rather than an incorrect or correct result,

• introduce the narrators in the script and their expertise on the topic to provide more context to the audience and in-turn promote their motivation, and

• create better interaction between the lessons and quiz (such as checkpoint questions at the end of each lesson or giving hints at the start of the video regarding what quiz questions would be discussed).

All other feedback provided by the reviewers was implemented to the training in the final stages of editing. In addition to the expert and peer reviews I conducted, through some personal reflection I also realized some steps that can be taken by others to further improve this resource in the future, including to:

• have actors entirely memorize script so there is no need for teleprompter,

• film in a more dialogue-friendly studio location with no fan or other background noise,

• create motion graphics in After Effects or a similar application that has better color reproduction,

• consolidate and remove less important links from the Resources section,

• film more of my own B-roll of the Central Coast outside of just Cal Poly’s campus, and

• make the quiz accessible in the LMS directly rather than an embedded external form.

In conclusion, I am very proud of how the training came out, as it is much improved from the previous two prototypes in which I took part in creating in the past. I think that the quality of the training is appropriate for a campus-wide resource, but of course there is always room for improvement as it will never be perfect. New iterations of the training would need to be created in the future regardless in order to keep the information up to date, which could be a great opportunity to even further improve its quality. If I could make any changes to my process for
this project, it would be attempting to navigate obstacles ahead of time and trouble shoot them as much as possible so I would have had the maximum time possible to edit.

**VII. Conclusion and Next Steps**

Sustainable Living Edu can help to greatly improve Cal Poly’s environmental awareness and efforts overall. This resource is incredibly necessary to engage students in these topics and build environmental literacy amongst the campus community, allowing Cal Poly students to contribute to the betterment of the greater society after graduation. After my graduation in Fall 2022, Cal Poly Green Campus Team and College Core will be continuing this effort, with the goal of this training becoming a mandated campus-wide resource and then CSU-wide movement. Until that goal is hopefully reached, Green Campus Team and College Core will work to promote the training in other formats, such as through the Office of the President, ASI, Academic Senate, Orientation, and more. For any future communication or inquiries regarding this initiative, the best people to contact are Jeff Williams (Learning Technology Specialist), Kylee Singh (Sustainability Coordinator, Facilities), Kalea Conrad (Co-Project Lead of Sustainable Living Edu and member of Green Campus Team), or Annika Furr (myself, Co-Project Lead and Producer of Sustainable Living Edu).
VIII. References


