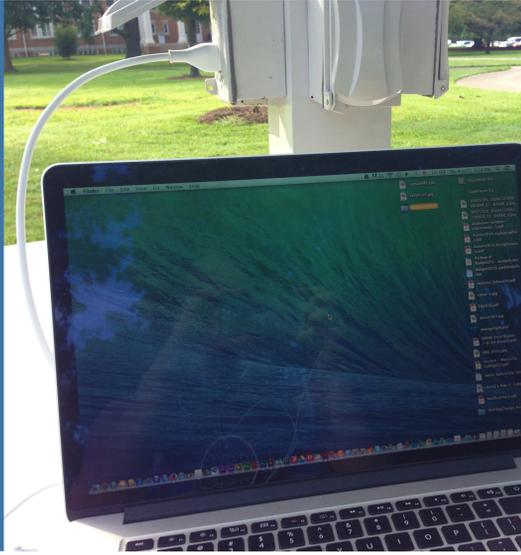


Less ENERGY AND MORE EFFICIENT DESIGN WITH A PRO-SOCIAL FRAMEWORK {Adrienne R. Schwarte, M.F.A.}



Laptop Charging at Solar-Powered Picnic Table

"If students sit at the Solar Doks® and charge their laptop for three hours per week, they would have enough charge to cover all 9 hours of the average active time spent per week and when attending class would not even need to plug-in their laptop, being essentially 'off the grid,' while designing."



This case study was completed to determine the most effective ways to reduce energy use and maintain optimum productivity in a graphic design lab. Along with energy use and user survey data analysis that validates design lab energy reduction expectations of this study, student projects are featured, as examples of the intentional design curricula used in this 'green' lab, to reinforce student education on conscientious energy use, while increasing environmental and social responsibility.

Energy consumption was measured in a small graphic design studio using an electricity usage monitor and reported in kilowatt hours (kWh) comparing 'active', 'idle' and total time for an accurate representation of energy consumption. Using a formula based on responses from a student survey regarding average hours of use weekly on the desktop computers outside of class, and average hours of use weekly outside of class for laptop users, a weighted average was generated, based on class type and the total number of hours spent on computers outside of class per week. Calculations were also generated for laptop use that measured battery life less than 20% and battery life fully charged. For total energy consumption in the lab, desktop use generated 108.93 kWh per week compared to 1.48 kWh per week with a laptop battery fully charged and 2.43 kWh per week for the studio when battery life less than 20% (Figure 1). An anticipated 98% reduction in energy for the studio is possible if the studio converted desktops to laptops, while still maintaining satisfaction by the students (per survey data results), and potentially increasing productivity.

introduction

SURVEY

In September 2012, art, design students and recent graduates at Maryville College were invited to participate in an online study about sustainable technology hardware and software configurations for creating and learning. (See Figure 2 & 3)

ENERGY MONITORING

In conjunction with the survey, an analysis of energy usage from 15 iMac 3.06 GHz Intel Core 2 Duos, One Apple® MacBook® Pro, 2 GHz Intel Core i7 and One Apple® 4th Gen iPad With Retina Wi-Fi 16GB was completed by utilizing the P3 International P4480 Kill A Watt Electricity Usage Monitor with Electronic Graphic Timer, measuring energy consumption by Watts (W), Amps (A), Volts (V) and Kilowatt Hour (kWh); Monitoring was completed in 30-minute intervals, and calculations were based on average daily and weekly usage provided from the results of usage hours identified in the online survey. In the 30-minute intervals, distinctions were made between 'idle' time for the computers (such as non-use or very minimal use (1 program open), and 'active' time, which included running multiple programs such as Adobe Creative Suite® software, internet browsing, music playing in iTunes® and YouTube® videos playing to mirror common active usage when students are working on design-related projects and multi-tasking.

methods

results

to see more survey results, along with the active and idle time graphs, and references visit the QR code above

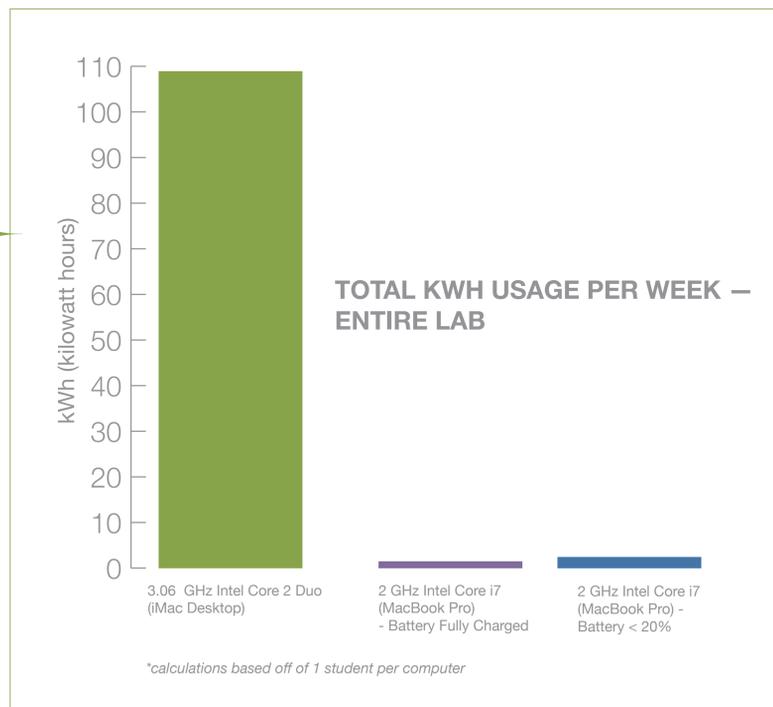


Figure 1. Total kWh Usage Per Week – Entire Lab

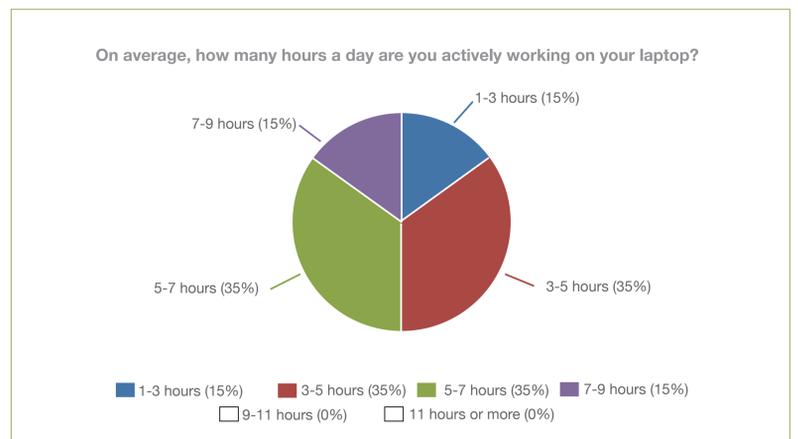


Figure 2. Average Hours Actively Working on a Laptop Per Day

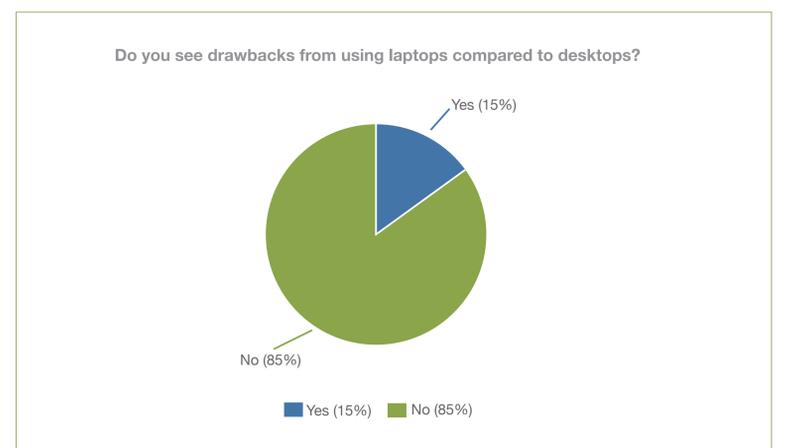


Figure 3. Drawbacks to Using Laptops Over Desktops?

SustainaStyle
Design Green Dresses

Megan Unthank

About This Project

SustainaStyle is a fashion design company that produces formal dresses made from recycled materials for occasions such as High School Prom. Every Dress is one of a kind and designed for every guest to the boutique.

Themes
Environment
Community
Business

Challenges
The fashion industry has been ruled around the ideas of the best is always the newest and more luxurious of designs. Therefore the industry is in a state of excess with the use of materials and resources for the designs created. This is detrimental to the environment but also means most dresses are mass produced and not always that special piece that makes anything extra special.

Solutions
The solution that SustainaStyle presents is dresses that are made completely from recyclable materials but also materials that are being reused in new ways. This cuts down the materials that are used and therefore can make clothes that help the environment and the community that they are provided in.

Business Products with Logos
Billboard Design
Dress Tags and Labels
USB Promotional Media Kit Installed
Media Kit
App for Ordering Dresses Online
SustainaStyle Magazine

Figure 4. Project Board Focusing on Waste Within the Fashion Industry, by Megan Unthank

discussion

Based on the energy consumption results and survey data, (with an average number between the less than 20% and fully charged battery for the laptop calculation) there is over a 98% reduction in energy consumption with the laptops compared to the desktops for total energy consumption. A recommendation of at least a 50% replacement of desktops with laptops (as 50% of the survey participants already own laptops) will yield consistent and significant energy savings in kilowatt hours and increase efficiencies without reducing the resources or benefits for students in the existing lab set-up. In fact, it could further enhance the student experience as students will be able to engage in out-of-class work in more portable/versatile ways, mirroring the professional design experience and potentially affording more frequent update to design software based on energy cost savings.

In parallel with this energy usage data and technology use survey is the development of design curricula that provides a pro-social framework alongside the practical education about energy efficiency. The ART 223: Design II/Sustainable Design course includes readings, assignments and action research centered on sustainability. Students complete semester-long action research projects following the *Design Ignites Change* program guidelines by Adobe® Foundation and Worldstudio Projects. Students develop a series of materials over the course of the semester that integrate their understanding of sustainable design, energy efficiency and community education. At the end of the semester students present their design boards (Figure 4).