

MELLON FOUNDATION FACULTY RENEWAL GRANT FINAL REPORT

SUBMITTED BY: PROF. JOHN ORE

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INSTITUTIONS: SOUTHWESTERN UNIVERSITY, TRINITY UNIVERSITY

NAME OF PROJECT: Course Development: Energy Sustainability for a Performance Space

DATE(S) OF PROJECT: JUNE 2010 THROUGH MAY 2011

AMOUNT AWARDED: \$7168

PROJECT GOALS AND OBJECTIVES

This project's primary goal was to create a multi-disciplinary course that delves into sustainable strategies for theatre production. Southwestern University's Heather Hall was designated as the field laboratory where a majority of the course's research and design projects would occur. This course design was collaboration among theatre faculty from Trinity University and Southwestern University, physics faculty from Southwestern University and three students from Southwestern University. In this new course, all facets of theatrical production would be studied, but a majority of course content would focus on lighting- the largest consumer of electrical energy. Secondary goals would include the publication of a corresponding web page and the establishment of an energy monitoring system whose real-time data would be publicly available via a kiosk housed in the lobby of Southwestern's Fine Arts Center. This grant added great support to an ongoing energy-sustainability project Heather Hall, a small black-box theatre classroom and performance space located in the Fine Arts Center.

REVISED GOALS

Originally, we proposed that this course would be cross-listed among theatre, environmental studies and physics. *Theatre Sustainability*, which is currently being taught, was cross-listed between theatre and environmental studies. Although the course contains numerous readings from physics' textbooks, we did not seek permission for a physics cross-listing. When we evaluate the course after its conclusion, we will revisit this issue with counsel from the physics department.

ACCOMPLISHMENTS

Our major project goals were successfully completed during this past year. In May 2010 Tim Francis, Bill O'Brien, Kira McEntire, Nathan Shaw-Meadows and I designed the new course *Theatre Sustainability*. Knowing that the first time that it could be offered was summer May term 2011, we laid out the class schedule, the associated readings, assignments and projects for the sixteen day (2.5 hrs per day) course period employed at Southwestern. Also, during the summer of 2010, we have established a web page "HEATHER HALL LED" (<http://www.southwestern.edu/academics/talloires/led/index.php>). This site is the fantastic work of sophomore SU theatre major Alexis Gette, who contributed great effort to make this grant successful. In the fall of 2010, we also acquired and installed an electrical energy monitoring system (Web-mon, E-mon) that was installed by William Schwartz, staff electrician at Southwestern University who has been a member of our project since we began (fall, 2009) this sustainable project. This

Web-mon system measures and stores real time use of electricity in Heather Hall. It also transcribes that usage into other useful terms that allow us to evaluate our carbon footprint. Since January 2010, we have archived data that shows on a daily basis how much energy is being used by the traditional incandescent lamps.

EVALUATION AND ASSESSMENT

We have based our evaluation and assessment upon the three main facets of the grant- new course development, energy monitoring system and web pages. The current (May 2011) *Theatre Sustainability* course will be evaluated by the standard Southwestern form and by a questionnaire with particular emphasis on course content, readings, and projects/assignments. Since this report is due prior to the course's ending date, we will send a sample questionnaire and a summary of the student data within a week of the course's completion (June 2). The Heather Hall LED webpage will be shared with all ACS institutions as is feasible. It provides information on our project meetings, light-emitting diodes, photovoltaic and wind energy products, etc. The ability to measure Heather Hall's energy usage and archive it on a web-based program is already providing our project with accurate data that will ultimately prove LEDs to be 'worth the cost.'

LESSONS LEARNED

After the third class meeting of the current *Theatre Sustainability* course, I re-ordered a substantial portion of the remaining class days. I retained the content and assignments as originally designed; however, based on the fact that the enrolled students had very limited theatre experience, I chose to provide a longer, continuous series of classes that were centered

on the theatre aspects that culminate in the students writing and performing their own scripts. Thus, we studied fossil fuels, non-renewable and renewable energy production as a block that consumed roughly the first half of the course. Then, we focused on current sustainable theatre practices, LEDs, script writing, acting and design.

IMPACT ON FACULTY

This grant brought three ACS teachers together to share research and teaching methods and to explore subject matter from each other's perspective. For instance, in an effort to prepare for the course creation collaboration, Professor Ore attended numerous meetings of Professor O'Brien's *Renewable Energy* course during the fall semester of 2010. Several assigned readings for the new course were selected from O'Brien's class's textbook. Ore was therefore privy to an associate's teaching style and acumen, and this experience was very instructive as well. The two met informally on numerous occasions during this grant period and they also attended meeting of the Heather Hall LED consortium that started this project. Tim Francis provided feedback on course content via email attachments during the initial phase of the course development. After a rough draft of the syllabus was completed, he travelled to Southwestern and attended an extended session with Ore, O'Brien, McEntire and Shaw-Meadows. Francis also participated in the project's design presentation in May 2010, displaying an LED theatrical fixture that broke new ground and excited the audience of more than 30 Central Texas citizens. In the fall of 2010, Francis also orchestrated a demo held at Southwestern from a premier lighting manufacturer whose sales representative brought its LED version of a long-throw

fixture that has been the standard in opera houses across the world- another landmark achievement for LEDs.

IMPACT ON SOUTHWESTERN AND TRINITY UNIVERSITIES

When President Jake Shrum signed the Talloires Declaration in 2007, he committed Southwestern to intentional sustainable practices through all realms of our academic community. The Heather Hall LED project was inspired by his leadership and by the vision of Heather McGaughey, a deceased SU theatre alumnus. Professor Ore served as her academic advisor during her undergraduate years. It is hoped that in future years when prospective students are being introduced to the Fine Art Center, that they will have the opportunity to see firsthand the ongoing results of resource sustainability being modeled and further developed when viewing the kiosk.

Trinity University also signed the Talloires Declaration and the Chair of their Dramatic Arts program sent this message to Ore after hearing from Tim Francis about the FRG.

Stacey Connelly: "Hope your Theatre Sustainability class is going well--it sounds fascinating. Would you mind sending me your syllabus? If you wouldn't mind, I'd love to offer it as a sample/model to discuss as we look ahead and think about some re-design of our own curriculum."

Many universities like Trinity possess small theatres that could be modified for multi-disciplinary studies in sustainability.

IMPACT ON STUDENTS

Creating bright, moral and courageous leaders is central to Southwestern University's mission. This grant allowed for a very fruitful interdisciplinary collaboration to occur among the three

faculty already cited and three of Southwestern's students: Kira McEntire (environmental studies), Nathan Shaw-Meadows (economics) and Alexis Gette (theatre). The self-discipline, passion and creativity shown by McEntire and Shaw-Meadows for this altruistic subject have consistently been in existence during the teaching of the current *Theatre Sustainability* course. Gette not only designed and generated the aforementioned web pages, she also created a MOODLE site for the course that was available to faculty and students. MOODLE is an interactive teaching site designed to house blogs, forums, and downloads for syllabus and the course packet of required readings.

DISSEMINATION OF PROJECT RESULTS AND FUTURE PLANS FOR PROJECT

The Heather Hall LED web page (<http://www.southwestern.edu/academics/talloires/led/index.php>) is the most universal way that the results of this project can be shared. This page will be maintained by Ore and a student assistant as long as Heather Hall remains a laboratory for sustainable practices. However, our project's focus on community education of sustainable practices will result in a public touch-screen kiosk to be located on a central spine of the Fine Arts Center. Web-mon energy data will be easily accessible from this kiosk. The desktop PC and touch screen were also funded by this grant. The kiosk itself is being designed as part of a research project course supervised by Professor Ore during the summer of 2011 by Kyle Mathis, an SU junior whose academic emphasis is the visual arts. We estimate that limited data will be available at the kiosk by fall 2011. Our goal ultimately involves designing and implementing a computer program that will explain to the curious passerby how LEDs have inspired this sustainability project and course.

PROJECT FOLLOW-UP

This FRG has been tremendously helpful to the Heather Hall LED project and because of this support, we have the infra-structure- a course and its laboratory- in place. Currently we have three LED fixtures in place; thanks to generous community and university support, we should have fifteen first-rate LED theatrical fixtures in place before the fall 2011 semester begins. Kira McEntire has been awarded a King Creativity Fund grant to test mono-crystalline and poly-crystalline solar panels, and we are now estimating these four panels with micro-inverters would be able to match the energy used by the three lighting systems in Heather Hall. All of this data will be available via the kiosk and we hope to publish it on the Heather Hall LED web pages as well. By the time we have achieved our goal of 0 carbon usage for Heather Hall, it is hoped that the *Theatre Sustainability* course perpetually will be taught at SU and at other ACS schools. Prof. Ore will always be willing to visit other schools virtually or in person in order to help spread the word that it is possible to be responsible stewards of our environment, even in the energy-dependent world of theatre.