In 2002, a team of Humanities and Engineering professors wrote to the William and Flora Hewlett Foundation hoping to secure funding for an enhanced approach to engineering education. The proposal was funded and in 2003, the CLEAR Program (Communication, Leadership, Ethics, And Research) was started. The CLEAR program prepares engineering undergraduates for leadership by improving their writing and oral communication, providing teamwork experiences, and expanding students’ understanding of ethics. This emphasis on communication and ethics responds to calls from industry and ABET that engineering undergraduates be competent in these professional skills. The framework of our program serves as a model for engineering departments across the country.

The CLEAR approach is unique because humanities doctoral students provide speaking, writing, and teamwork instruction to engineering undergraduates in their required, core classes. Our interdisciplinary approach enhances the effectiveness of instruction. Students learn about communication competencies from experts while completing engineering projects. CLEAR instructors work with me (the program director) to develop and implement discipline-specific instructional modules. We know that our pedagogy is current and empirically tested because we are immersed in the latest research.

Through research, we are able to disseminate information about our innovative program to others across the country. This year, six new projects are underway. Perhaps more importantly, we connect our communication instruction to leading research from communication, composition, engineering, and education scholars. This allows us to remain an exemplar program. Professional conferences allow us to share our ideas and learn from others to ensure that we engage in cutting-edge pedagogical techniques.

We are committed to being a leading engineering communication program. I meet with CLEAR instructors monthly to brainstorm ways to enhance the work that we do. In the interest of continual improvement, we revise our instruction, assignments, and evaluation practices continually. In addition to providing training sessions for the instructors, I conduct end-of-semester retreats to plan and revise for future semesters. We host faculty workshops periodically to both showcase exemplar collaborations and provide a forum for us to learn from each other so we might capitalize on strengths and minimize weaknesses.

After several years of teaching professional presentation, documentation, and teamwork, we are now working on providing greater depth of instruction—again, based on the latest empirical research. You will begin to see some of our new approaches in your classrooms and we always welcome your feedback and suggestions. Together, we can have a lasting impact on undergraduate engineering education.

April A. Kedrowicz, PhD
Director, CLEAR Program
You walk into a room, sit down, the lights dim: There it is, the PowerPoint presentation from the early 90’s, complete with sentences, clip-art, and crazy transition noises. Luckily in engineering classes, this image is part of the past. Just as engineering designs change and progress, so do communication techniques. In the last decade, communication scholars have stressed the importance of incorporating quality visual aids (slides) in presentations. Research shows that an audience is more likely to retain information when it is presented with visual justification. Audiences are incapable of simultaneously reading and listening to a point of full retention and comprehension. It is because of these ideas and more that CLEAR instructors are changing the standards and instruction surrounding slide design.

CLEAR instructors have already begun to enhance their instruction by having students present PowerPoint slides that provide an assertion or claim with visual evidence as support. Known as assertion-evidence slide design, this presentation style keeps the audience centered by taking into account the science behind brain function and retention as it pertains to presented information. Each slide should contain only one idea, as more than this becomes clutter for the audience and makes comprehension difficult. A visual aid is meant only to enhance what the speaker is saying not to replace the speaker. While this style of presentation requires more preparation from the students, the results are worth the time. CLEAR instructors are relying on the latest research to inform their presentation pedagogy so engineering students are fully prepared for the professional demands of their job.

A mechanical, a chemical, an electrical, and a computer engineer are all driving to a new, interdisciplinary conference when their car breaks down. “Sounds to me like the pistons have seized. We’ll have to strip down the engine before we can get the car working again,” says the mechanical engineer. “Well,” says the chemical engineer, “it sounded to me as if the fuel might be contaminated. I think we should clear out the fuel system.” “I thought it might be a grounding problem,” says the electrical engineer, “or maybe a faulty plug lead.” They all turn to the computer engineer who until now has not said anything: “Well, what do you think?” “Ummm, what if we all get out of the car and then get back in again?”

*CLEAR cannot guarantee that everyone will find this joke funny.
Guest speakers representing different aspects of the Civil Engineering program visit Civil Engineering’s freshman class (CVEEN 1000). It was during one of these guest speaker question and answer sessions in Fall 2009, that Dr. Steven Burian (a Civil and Environmental Engineering Professor) and Maria Blevins (a CLEAR Program instructor and Communication PhD student) discovered that they were asking similar questions about sustainability and water resource engineering and management. This shared interest in environmental issues led to an interdisciplinary collaboration surrounding how engineers learn about sustainable design and the complexities of interdisciplinary communication.

Maria was a communication instructor in that freshman class and was inspired by the work Dr. Burian was doing regarding water management and sustainability. This prompted Maria to ask Dr. Burian to serve on her doctoral studies supervisory committee. As a member of Maria’s committee, Dr. Burian brings a perspective on interdisciplinary and praxis that makes her graduate experience more robust.

In spring 2011, Maria participated in an interdisciplinary class: Hydrotopia—Water Management in the West (CVEEN 6480). This class is team-taught by Dr. Burian and Dr. Barbanell (Philosophy). It investigates water management issues from both an engineering and environmental philosophy perspective. Engineering and Humanities students work together and participate in diverse activities from using engineering software to calculate water usage at the U, to discussing the spiritual nature of water. The goal of the class is for the students to have a new way of conceptualizing the value of water. Maria was able to play a part in this class during spring of 2011 because of the rapport established between herself and Dr. Burian.

The Hydrotopia class inspired a paper co-written by Dr. Burian, Dr. Barbanell and Maria entitled “Avoiding Another Tower Of Babel: Bridging Communication Barriers Among Students And Instructors From Civil Engineering, Humanities, And Other Disciplines In A Multidisciplinary Course” that was presented at the 2011 ASEE conference. The paper discusses the challenges and opportunities presented in the epistemological differences between engineering and the humanities and how all involved benefit from investigating the difficulties of balancing the social, environmental, recreational, and spiritual demands of water in the world.

They are now working on a research project comparing the perceptions, knowledge, and ideas surrounding sustainability in the Civil and Environmental Engineering and Mechanical Engineering departments. The idea for the project emerged during a conversation about the different cultures characterizing engineering departments and wondering if students that were more focused on sustainability were more likely to be drawn to mechanical or civil engineering. They hope to continue the project as a longitudinal study of how attitudes about sustainability evolve.

The challenges associated with water resource management, global climate change, and sustainable design are complicated and will require thinking and expertise from multiple fields. The current collaboration between a Civil and Environmental Engineering professor and a Communication graduate student will hopefully add complexity and depth to the exploration of these important issues.
CLEAR Instructors Invited to Present at the Joint Engineers Conference

CLEAR instructors Kimberly Aguilar and Jenn Gibbs will travel to Helena, Montana later this year to participate in the 2012 Montana Society of Engineers Joint Engineers Conference (JEC). Kimberly will facilitate a session on best practices for technical presentations. Her 90-minute session will focus on how visual aids can be an effective means of reinforcing key material and she will provide information on how to use presentation programs to maximize their full potential. Jenn’s course will focus on how engineers can improve high stakes documents with professional individual and collaborative editing practices. The presenters will integrate the most current empirical research into their JEC sessions. Join us in congratulating Kimberly and Jenn on this exciting professional opportunity!

RECENT PUBLICATIONS


RECENT PRESENTATIONS

CLEAR Instructors present papers at this year’s regional communication conference, the Western States Communication Association in Albuquerque, NM

Top Student Paper - Environmental Communication Interest Group

Sarah Bell – Mapping Value on the land: An Analysis of Evidence in the 1889 Senate Special Committee Hearings on the Irrigation and Reclamation of Arid Lands.

Kimberly Aguilar – Cold Calling As A Viable Teaching Method: A Survey Of Cold Calling On Students With Communication Apprehension

Maria Blevins – Obstacles And The Power To Overcome: Sustainability Education In Mechanical Engineering Programs


April Kedrowicz and Kimberly Aguilar – Communication Across The Curriculum And Civic Engagement: Engineering Responsible Leadership.

Brian Rogers – “Stuff Hipsters Don’t Like”: Other Hipsters, Gentrification, Smiling, And Analyses Regarding How They Constitute A Public

Carlos Tarin (with colleague James Fortney) Born This Way? A Critical Interpretation Of Race And Lady Gaga.

(For additional information about any of these presentations, please e-mail Stephanie Fratto at stephanie.fratto@utah.edu.)
A national panel of educators has recommended that college graduates should be intentional, responsible, and enabled learners.

1. To meet the goal of intentional learning, we need to help our students to become integrative thinkers, see connections among disciplines and, reflect on their acquired knowledge.
2. Since responsibility to act as informed citizens is based on values, principles and commitments, we need to help students acquire these values and principles. Responsible citizens are active participants in their society and can see consequences of their own and others' actions and decisions.
3. Enabled learners can use their knowledge and skills to communicate their ideas, solve complex problems, and manage practical situations.

As you review, revise, and plan your courses for next semester, ask yourself how well or how much are you fostering these skills our students. This thought process may allow you to incorporate these desirable outcome indicators without making significant changes to your course structure.