

Integrating Design and Engineering in a Liberal Arts Environment Ongoing Developments at Wesleyan University

The Role of the President

The current exploration of the roles design and engineering might play in the overall Wesleyan curriculum stems from President Michael Roth's interest in pragmatic liberal education. From his days as President of the California College of the Arts, Roth had thought of design and engineering (D&E) as ways of thinking that could have a very productive set of connections to other areas taught at a liberal arts college. Unimpressed by objections that D&E were "vocational" and hence inappropriate for Wesleyan, he took the point of view that *a holistic approach* to D&E might even become part of the core of liberal education in the future. In 2010 he broached the subject of D&E at the meeting of Wesleyan's Board of Trustees and also in the Alumni Magazine. Already he had been talking about this with the Provost, who wrote up a preliminary to-do list with respect to engineering:

- a. Inventory courses offered at peers
- b. Inventory courses available at Wesleyan
- c. Consider viability of major or minor track (e.g., in physics, COE, Computer Science, etc.), or Certificate
- d. Consult Key Faculty on
 - I. Courses
 - II. type of program
 - III. Capacity in existing departments
- e. Visit programs elsewhere?
- f. Develop model of staffing needed
- g. Consult Educational Policy Committee (fall)

One of the first concrete actions taken was the creation of a website devoted to explaining (and promoting) current opportunities bearing on engineering. The site wesleyan.edu/engineering was created through the joint efforts of the President's Office and Professor Lutz Hüwel, the Engineering liaison. Here's the gist:

You *know* you want a liberal arts education, but you also *think* you want to be an engineer. Wesleyan does not have an engineering major, so what can you do?

- You can give yourself a strong foundation for graduate work in engineering.
- You can build skills that will enhance your engineering career over your lifetime.
- You can get a taste of engineering in a variety of courses and research opportunities.
- You can participate in a 3-2 or 4-2 program which gives you both a B.A. from Wesleyan and a B.S. in engineering from Columbia, Caltech, or Dartmouth.

While the reluctance of Wesleyan students to leave the campus and their classmates has always curtailed interest in the dual-degree programs, interest in these programs has been growing, including increased inquiries among candidates for admission to Wesleyan.

Facilitating engineering options away from campus is obviously quite different from creating on-campus options, and in late 2014 the President began conducting a series of conversations with people with different experience and expertise about the prospects of D&E courses here. He met with representatives of IDEO, Stanford Design School, Stanford Engineering, Google, MIT engineering, and Yale engineering, among others, to gather information on how to proceed. The idea he began with is that while Wesleyan had science and art classes (including classes in graphic design and game design) relevant to D&E, it would likely want to add 6 or 7 core classes for engineering. A key issue would be the relationship between design and engineering. Should the faculty aim to combine design thinking with the introductory classes (such as Engineering for Everyone and Fundamental Engineering Principles); or rather combine it with other classes? Should classes be added entirely devoted to design like “Introduction to Design Thinking” and “Design as Problem Solving”? Or should “environmental design” be integrated into the College of the Environment and “fundamentals of digital systems” into the Computer Science Program?

2015-16 Partial Launch

In 2015 faculty began to be involved in earnest. Francis Starr, Director of the nascent College of Integrated Sciences, pulled together a group of faculty and staff (including the provost and deans) to brain-storm the possibilities, giving the group the name IDEAS (Integrating Design, Engineering, and Applied Science). He quickly found some consensus around *projects*, either stand-alone, or part of a course, as a way to drive student engagement:

Thus, a possible starting model could be to have smaller course-based activities for freshman (e.g., lego robots or other well-defined activity) that lead into more substantial projects for upper-classman, which may connect with national competitions. Courses (or mini-courses) could be tailored to help support such a large scale project. Thematically, it would be very "Wesleyan" for these projects to ultimately lead to social engagement. Moving forward, there are three areas we need to target: projects, courses, and seminars. Down the road, we have to decide how this could be credentialed, but I (Starr) prefer to delay that conversation until we have a better idea of what we can do, where faculty wish to dedicate energy, and what resources might become available. Otherwise we have the cart leading the horse.

The next step was to identify courses that could be part of the initial offerings. It is the scientists in the group, especially Francis Starr, Joe Knee (dean), Greg Voth (physics), and Brian Northrop (chemistry) who more readily embraced these ideas on how to move forward. More work needed to be done, it was agreed, to stimulate interest among faculty in the arts, humanities and social sciences.

At the same time as these discussions were going on, the President submitted a request to the Mellon Foundation for a grant to support the introduction of certain courses in design and engineering. That request resulted in a mid-career Presidential grant that will enable a number of courses and programs to take place over the next two years. Academic Affairs set to work in finding classes, and has come up with three new courses for spring 2016. It also pulled together (Fall semester of 2015) a multi-day program in design studies with Susan Yelavich (New School) consisting of a Public lecture (entitled "A Literature of

Things and Places: Reading and Writing Design with Orhan Pamuk”), a workshop for 15-18 students (representing different quadrants of the university), and separate meetings with interested faculty members.

2016 and Beyond

In 2016-17, there will be two new courses taught by Visiting faculty new to Wesleyan (both originating through alumni contacts):

Christopher Weaver is an alumnus (entrepreneur, software developer, and educator at MIT) will teach a course in Game Design through the College of Integrated Sciences.

Ric Grefe, recently retired as Director of the American institute of Graphic Design (AIGA), will teach a course in Human-Centered Design and Social Change through the Allbritton Center for the Study of Public Life. Grefe’s social challenges range from election processes to subsistence challenges in impoverished rural populations. (This contact was made following up on a suggestion from an alumnus who had heard President Roth speak about D&E at an alumni event.)

This will be the second “design thinking” class for credit taught at Wesleyan. Last semester a student-led class, *Innovation through Design Thinking*, was offered through the Patricelli Center for Social Entrepreneurship; it built upon the experience the previous semester of students and staff who took a MOOC on human-centered design. Where the MOOC had not been for credit, the full-credit student-led class received the rigorous attention students here typically devote to their coursework, and the peer-to-peer format worked well for learning the theory and practice of human-centered design. In the spring, students interested in innovation through design thinking won’t have to teach it to themselves.

A spring course in Digital Art is being offered for the second time by Christopher Chenier of the Digital Art Studio, and the Film department will be teaching a game design course entitled “Videogames as/and the Moving Image: Art, Aesthetics, and Design” cross-listed with Computer Science.

The cluster of classes related to D&E should grow as the Provost plans to solicit faculty asking for ideas on courses and teachers. to explore “Engineering Connections in the Liberal Arts College Environment.” The Provost and Academic Affairs will be tracking student interest in the classes and programs related to D&E. If interest is robust, as expected, the integration of engineering and design into the curriculum should accelerate.

This spring Wesleyan will send staff and faculty representatives to the Workshop at Macalester College

Conclusion and Observations

Contributing to Wesleyan’s readiness to respond to the President’s challenge is the historic academic infrastructure at Wesleyan. Forty years ago, there were already cross-disciplinary colleges of literature (COL) and social science (CSS) providing living-learning structures across fields. More recently, the Wesleyan infrastructure has included in addition to standard Departments: a College of Integrative Sciences, a College of the Environment, a Digital Design Studio, a Machine Shop, a Science in Society Program, a Center for Pedagogical Initiatives, the Patricelli Center for Social Entrepreneurship, and a Center for Community Partnerships (to encourage student service.) Thus, there is a readiness to collaborate across disciplines, and a taste for being on a cutting edge. This has enabled progress the President to link his interest in D&E – and his belief in its importance not just for the making of things but also for creative thinking and problem-solving generally— with emerging student interests and priorities. Moreover, the participation of alumni called upon to contribute ideas should enlarge the University’s range of contacts in these fields.

(Full disclosure: the editor of this series of Case Studies of Engineering-Enhanced Liberal Education was once a senior administrator at Wesleyan.)