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## Facepalms and cringes: liberal education misapprehended

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Many well-intentioned engineering faculty, eager to integrate engineering and liberal arts, do not seem to truly grasp the meaning and intent of liberal education. Most of us are doing it wrong, and our colleagues across campus would cringe or facepalm at our efforts. Such moments reveal our (conscious or unconscious) misapprehensions of liberal education. Reflexive engagement of these misapprehensions may be a productive site for our own liberal education.

**Keywords:** liberal education; critical participation; engineering education

The Liberal Studies in Engineering proposal requires involvement of faculty across disciplines in the humanities, social sciences, and engineering. Yet, many well-intentioned engineering faculty, eager to ‘integrate’ engineering and liberal arts, do not seem to truly grasp the meaning and intent of liberal education. Some of us surely did not receive the benefit of a liberal education, or it may have been trained out of us in graduate school, or even earlier in our careers.<sup>1</sup> Perhaps our engineering programs failed us. Perhaps we took the ‘easy A’ courses in the humanities and social sciences and never took our own liberal education seriously. In the end, our best intentions are not enough. Most of us are doing it wrong, at least some of the time, and our colleagues across campus would cringe, face in palm in the back of the room, if they sat in on our classes. Such moments reveal our (conscious or unconscious) misapprehensions of liberal education.

### **Liberal education as separate from engineering**

The very notion of integrating engineering and the liberal arts is problematic for its false dualism and its lack of precision, reinforcing the idea that engineering is separate from and outside of some unspecified grouping of disciplines that constitute the liberal arts. Perhaps we are wrestling with a perception real in its consequences, but we would do well to remain wary of perpetuating false divisions in our efforts to overcome them.

### **Liberal education as general education**

Liberal education is often reduced to well-roundedness or educational breadth, which can also be achieved through a prescribed general education curriculum. A key distinction between general education and liberal education is freedom of curricular choice. But even

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<sup>1</sup>Cech, “Culture of Disengagement,” 2014.

when choice exists, cultural norms in engineering constrain student choice to a small number of easy courses that make more time for engineering.

### **Liberal education as instrumental professional skills**

Particularly due to pressures of accreditation, and in today's structural–functionalist education climate, liberal education is easily reduced within engineering to a set of professional skills: writing and ethics have no intrinsic value, but must be taught as industry demands. And some see no problem in a 'hide the vegetables'<sup>2</sup> approach that teaches only *engineering* ethics, history and philosophy of *engineering*, *technical* communication, so that engineers need only learn those narrow aspects of other disciplines that intersect with their major.

### **Liberal education as privilege**

The presumption that only privileged students at elite private colleges and universities are interested in or worthy of liberal education pervades many academic conversations around engineering and liberal education. Who is invited to attend and to speak? Who is invoked as role model? Attempts at 'integration' – whether with anthropology, literature, history, or art – overwhelmingly cite work of dead white European males. This is a caricature of disciplines that have long since contested, expanded, or abandoned their canons. Perhaps it is itself an appeal to privilege, erasing subaltern contributions in a hyper-normative throwback to false rigor.

### **Liberal education as self-indulgence**

Sometimes engineering faculty hobbies manifest as pet projects in engineering courses – a musician has students take apart an amplifier; a movie buff screens *Apollo 13*. While engaging, entertaining, and popular, ultimately these do not suffice as liberal education if there is no engagement of other disciplines (film studies and music) epistemologically, analytically, and on their own terms, and if there is no reflection on the larger project of students' learning in the context of their own lives. This harkens back to undergraduate engineers' jealous dismissal as 'fluff' or 'navel-gazing' those non-engineering assignments providing opportunities for self-exploration. Oblivious to the intellectual depth of these exercises as undergraduates, engineering faculty now mimic them superficially in our classrooms as a gesture toward 'liberal arts'.

### **Liberal education as dilettantism**

Related to the self-indulgent view is the notion of liberal education as a haphazard smattering of superficial exposures. Add an element of history here, a writing assignment there, an ethics case study every blue moon and presto! Liberal education. The most dangerous aspect is that engineering faculty dilettantes can mischaracterize or reduce entire genres of knowledge, damn the consequences. The cringe-worthy use of 'liberal arts' or 'humanities' to refer to all knowledge outside of science, mathematics, and engineering belies ignorance; hackneyed fallacious attacks on movements like postmodernism demonstrate

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<sup>2</sup>Lapine, *The Sneaky Chef*, 2007.

recklessness that can only be met with a facepalm. With friends like these, the movement for engineering and liberal education does not need enemies.

### **Liberal education as content not pedagogy**

Focusing on content alone, some engineering faculty add a reading on contemporary social context or ethics without taking seriously what is required pedagogically. Few engineering faculty are experienced in designing questions, facilitating discussions, developing assignments, or evaluating student work in these areas. Criticality and reflexivity are not sought, relationality is never even considered, and liberal education is lost, leaving a hollow shell of information.

### **Liberal education as application of engineering epistemology to other domains**

When only content matters, the non-engineering discipline's epistemologies and methodologies are abandoned, in the worst cases leading to uncritical substitution of an engineering tool – for example, an art and engineering class that abandons art's understandings of color and light for physical analysis of wavelength and amplitude,<sup>3</sup> or the reduction of ethics analysis to engineering problem solving.<sup>4</sup>

That engineers presume we are capable of cross-disciplinary integration without significant faculty development and collaboration reveals epistemological hubris borne by engineering's privilege within academic power structures. Engineering ignores these power differences and dismisses other ways of knowing because it can. Attention to (and resistance of) this power dynamic can ultimately help us learn to do it right, without facepalms and cringe-worthy moments. This is a necessary precursor to any Liberal Studies in Engineering endeavor. Through long-term, holistic, reflexive engagement in cross-disciplinary communities, we might share wisdom with mutual respect and humility, arriving somewhere entirely different. We might at last experience liberal education: the critical thinking<sup>5</sup> and reflective action that comes from engaging different ways of knowing and doing, connected to the authority of one's experience, and developing the judgment to distinguish among these, knowing when to apply which set of epistemologies, which questions, and which forms of analysis, ever grounded in praxis.<sup>6</sup>

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<sup>3</sup>Snider, "Light and the Arts," 2006.

<sup>4</sup>Harris, Pritchard, and Rabins, *Engineering Ethics*, 2013.

<sup>5</sup>Clariss and Riley, "Situation Critical," 2012.

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