

Engineering as Lifestyle and a Meritocracy of Difficulty: Two Pervasive Beliefs Among Engineering Students and Their Possible Effects

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It seems a universal feature of human experience to tell stories about one's place and direction in the world. This paper reports on a collection of common narratives that come from a distinctive student culture, that of undergraduate engineering education in the U.S.

Implications of Findings

This study suggests both a *meritocracy of difficulty* (i.e., because their school work is much more difficult and competitive than that of students in other departments, they deserve the comfortable material existence an engineering degree will provide) and a view of *engineering as lifestyle* (i.e., the expectation that an engineering degree will result in a comfortable material existence) as pervasive beliefs among engineering students. Thus, we hypothesize that one available discourse for engineering students to explain their positions in their current and future lives involves linking these two beliefs in the following way: students in other majors have easier and better lives, so there must be some reward—in the future—for the sacrifice and hard work that is unique to engineering education. This reward is a high paying job and a comfortable lifestyle.

The line of analysis in this study led to two substantive recommendations for engineering education. First, try to establish ways that students can have, through experience in engineering education, other leading reasons to become engineers than a comfortable lifestyle. Second, engineering education ought to deeply examine how much of its curriculum can be “weeded out” as unnecessary for whatever reason. This would allow the education experience of college students to be less packed and more focused.

Engineering education may never be easy, but it may be an artifact of the meritocracy of difficulty and the disjointed process of how curricula evolve over years that makes it as hard as students currently experience it.

Engineering education could also do a much better job establishing what the craft of engineering is as a form of usable knowledge for students and what engineering can do to improve the socio-technical systems that are ubiquitous in our lives.

One of the most significant implications of the meritocracy of difficulty in engineering is how it led engineering students to distinguish themselves from students in other majors and to place their discipline in a clearly superior position to others.

Method and Background

This study is part of the Center for the Advancement of Engineering Education (CAEE)—a longitudinal study of undergraduate engineering education. Analysis in this paper is based on transcript data from ethnographic interviews conducted as part of the Academic Pathways Study (APS) research element of

CAEE that involves four of the five partner institutions. Transcript data is derived from ethnographic interviews collected with students in each of the four programs over the first three years of their engineering degree programs.

What We Found

The analysis of the question of why students were pursuing engineering revealed a pervasive reported belief among many participants in the study that they are pursuing engineering as a way to make good money and have a comfortable lifestyle (engineering as lifestyle):

Max: Yeah, that's a huge factor, I'm really a materialistic person, I like to spend money...I have three bikes, and I put a lot of money in my car. I like to buy stuff that I can use so...that was a big thing through high school is I wanted a lot of stuff and yeah money's a huge factor why, why I go to class every day...

We found very little detailed or impassioned talk about engineering as a craft or engineering as a force of good in society. Reasons for this absence may have to do with how little direct contact students have with engineering as a distinct practice in their first years in engineering programs.

When asked about their experience in engineering education, students in this study used no word more often than "hard." The difficulty of engineering in our analysis is the defining value of the experience and it is one that organizes a number of other beliefs. The meritocracy of difficulty belief organizes a status hierarchy of engineering disciplines, a superiority of engineering over other disciplines, and it establishes that a person is worthy of engineering only if they are willing to work extraordinarily hard and to sacrifice experiences and basic pleasures that are ordinary to other college students:

Simon [describing a typical day]: Yeah, that's pretty easy. Wake up, go to work from 7:30 to 9:30, go to class from 9:30 to 12:30, eat lunch, work from 1:30 to 5. Get home, eat dinner, homework till 12 to 2, go to bed, wake up. I do that every day and then weekends I just don't go to work I just do homework...

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There is nothing unusual about the ideas of a meritocracy of difficulty and engineering as lifestyle as described in this paper—it is part of an American idiom that runs at least back to the writings of Benjamin Franklin (i.e., early to bed and early to rise makes a man healthy, wealthy, and wise). Yet this combination of beliefs is worrisome in the context of some of the goals we believe to be widely shared within the engineering education reform community.

One of these goals is to promote an image of engineering as a force of good in the world. Even though this message is one of the many messages that engineering students hear and see in their college experiences, it seems to have very little hold over them. Perhaps students don't quite believe this about engineering, because it is only something they have heard but not experienced.

A second goal of engineering education reform is that engineers should design better for people and the world, because they understand them better. The distancing from other people that the meritocracy of difficulty appears to produce and the sacrifices students report making in all other parts of their lives does not bode well for achieving this goal.