PREPARING FOR THE FUTURE OF LAW: LESSONS FROM A NEW ENGINEERING SCHOOL

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ABSTRACT
Like a number of other professions, the field of law is undergoing a significant upheaval due to a confluence of social and technical factors; in particular there has been an imminent rise of technologies to supplant (or augment) many of the activities of practicing lawyers. In response to these changes, law schools have the opportunity to redesign their curricula and pedagogical approaches to be more responsive to the needs of their students, helping them to develop the skills and abilities that will serve them well in this new world. This article outlines some ways of thinking about and creating these new educational experiences, informed by the author’s experiences as one of the early faculty at the Olin College of Engineering, an undergraduate institution that was created to address similar challenges in the profession of engineering.

INTRODUCTION

It has become a truism that technology is dramatically changing the practice of most professions, including law, and this will drastically reshape the professional world into which law students graduate. The educational system is largely based on a one-size-fits-all industrial model, which is increasingly inappropriate for the post-industrial developed world. And the value proposition for students has changed dramatically. Tuition fees have risen substantially, and even in professions like engineering and law, students no longer expect to spend

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four years in school and then settle into a stable career. These changes suggest that we need to overhaul higher education broadly to help students develop a set of skills that will help them succeed in the world into which they will be graduating.

Olin College of Engineering, an engineering school outside of Boston, Massachusetts, which graduated its first class in 2006, has been wrestling with these issues for a decade. The college was founded with a mission to both educate our students differently and work with other schools to change how they educate their students. This author’s experience as one of the early faculty members at Olin informs the perspective presented here.

**The Changing Future of Law**

Picture the practice of law in the technological world of a decade from now—or, at least, law as it might be practiced if technology is used to the fullest. Every practicing attorney would have in his office means for convenient electronic connection to a huge national central repository of facts, rules, procedures, and precedents. For the routine filing of papers, records, and petitions, he or his assistant would introduce his data into the intellectronics system, a technique his legal training would include. Any conflict, omission, inconsistency, or other shortcoming of his work, any problems with the law or the existing records or the claims of another, would be automatically, instantly displayed to him. And it would cover not just the few possibilities an unaided human brain might have handled, given enough time. It will scan, select, reject, and present the result of the equivalent of the work of thousands of searchers covering many decades of records over the entire nation in a split second.

It elevates the lawyer’s intellect to the more complex intellectual tasks, giving him better tools with which to work. It alters a substantial fraction of legal practice.

Even on the nonroutine legal processes, the attorney, in the coming intellectronic age, will be able to consult with the equivalent of a host of informed fellow attorneys. His request to the system for similar cases will yield an immediate response from the central store, together with questions and advice filed by other attorneys on those similar cases—even as he will add his facts and guidance into the system for future use by all.

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While this quote dates itself with the word ‘intellectronics,’ the assumption of a national (rather than decentralized or private) system, and the exclusive use of the male pronoun, the future it predicted half a century ago is starting to come to pass. Five areas of law are immediately ripe for replacement with machine intelligence. In rough order of technological maturity, they include: discovery, search, legal forms, briefs and memoranda, and legal analytics. Recent law graduate Tim Hwang joined a law firm for a year in order to test out his software for automating the workflow of young lawyers before setting up his own law firm (jocularly known as Robot, Robot and Hwang), based on automating as much repetitive work as possible in order for lawyers to concentrate on more complex matters.

This is part of a more general trend towards automating anything that can be automated. A familiar example is the decline of travel agents with the rise of online booking software for flights and hotels. It is worth noting, however, that the number of flights booked by the few remaining full-service travel agencies has risen by 11% over the past four years. This highlights the general issue: while routine work can be automated, only humans can deal effectively with complex issues, particularly ones that involve relationships with other humans. Futurist Jamais Cascio describes this as the ‘pink-collar future.’ “Jobs where empathy and ‘emotional intelligence’ can be considered requirements, often personal service and ‘high touch’ interactive positions, have by and large been immune to the creeping mechanization of the workplace.” The converse is also likely true: to the degree that a profession focuses on these humanistic elements, it will be immune to mechanization.

This suggests that the future of law will likely involve fewer lawyers, doing more strategic, challenging work. If history is any guide, law firms that do use new technologies effectively (to automate what can be automated, and use humans to do high-touch, strategic work) will

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4 McGinnis, supra note 1.
handily outcompete law firms that do not move in this direction. Of course, history being a guide, many established firms will not move in this direction until it is too late; while the parallels are not direct, the response of the music industry and, more recently, journalism provide some clues.  

If it is imagined that the profession of law will look different in the future, that suggests that the way law students are educated may also need to change. A fruitful approach is to redesign curricula in a way that is not only responsive both to the needs of students and employers but also incorporates findings in educational psychology to increase the effectiveness (rather than the efficiency) of learning experiences. While law schools normally have a more student-centered educational culture than engineering schools have traditionally had, there is still room to bring in new pedagogical approaches to course and curricular design.

LESSONS FROM THE OLIN COLLEGE EXPERIENCE

Olin College of Engineering was conceived in the early 1990s, received its charter from the State of Massachusetts in 1997, and graduated its first class of students with a four-year baccalaureate in engineering in the spring of 2006. It was very much created in response to a changing world; in particular, it was created in response to calls from the National Science Foundation and the National Academy of Engineering to redesign engineering education. Since then, initiatives such as the National Academy of Engineering’s Grand Challenges have highlighted the need for engineers with the ability to address global problems with both significant technical and social components (such as providing access to clean water or securing cyberspace). The changing profession also mandated a move away from the Cold War model of engineering education, which former University of Illinois at Urbana-Champaign engineering professor David Goldberg describes as beginning with the “math-science death march,” with its emphasis on individual work, closed problems, and the scientific fundamentals.
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of engineering. Olin College was created to educate engineering students in a way that emphasized design, innovation, collaboration, and entrepreneurship. From the outset, the curriculum was characterized by a do-learn, hands-on, project-based pedagogical approach.

An example of this is Design Nature, a first-year, first-semester course (the first of a five-course engineering design stream that culminates in a senior capstone project). In this course, students go through the engineering design process twice. The first time through is heavily scaffolded, stepping them through the process as they individually research, conceive, fabricate, test, and demonstrate small bio-inspired mechanical hopping toys, fabricated from laser-cut plastic and a constrained set of additional parts. During the second half of the semester, they work in teams to create a remote-controlled toy animal, complete with a game, that is appropriate for fourth graders; in fact, fourth graders from a local school come to campus at the end of the semester to play-test the prototypes the students have built. This leads to some questions: What might be the law school equivalent of this type of student experience, where law students go through a scaled-down but nevertheless authentic professional experience, developing a range of skills? How can law schools help students to develop complex behavioral and cognitive skills throughout their education? What are some underlying principles that might be used to design such courses for the law school curriculum?

Creating New Educational Experiences

One approach that we take to creating a new course at Olin College is to think of it as a design project. This involves understanding the users (generally the students themselves, but often other stakeholders), defining a set of outcomes or objectives (what do we want students to be able to do at the end of the course?), and exploring the creation of educational experiences (ranging from a single class session to an entire program) to achieve those goals, followed by testing, iteration and refinement.

14 Id. at 4, 8–9.
There has been much interest recently in online learning, primarily in the form of massive online open courses (MOOCs). The hope for these courses is that they will increase access; the reality is that the students who are most successful in them are well served by traditional education. The pedagogical approaches of online courses (and many in-person courses) embody what Ursula Franklin calls the “production model” of education: students are viewed as products with applicable quality control, and there is a mandate to be as “efficient” as possible.

Residential programs, on the other hand, have the opportunity to focus on what Franklin calls the “growth model” of education, in which the responsibility of educators is to create an environment in which individual learners can grow and develop. These programs foster community, collaboration, individual mentoring, and constructivist learning (learning by interacting with the world). From a strictly practical perspective, focusing on these elements allows residential programs to distinguish themselves from online alternatives: if what is being done in the classroom can be replaced with a video screen or otherwise replicated on the Internet, it will be. Particularly in engineering, the traditional pedagogical approaches emphasized individual work and learning content; with few exceptions (like labs), any learning that happened as a result of experiences or relationships with fellow students were treated as a side effect. But residential programs have the opportunity to put these types of learning experiences front and center.

This might be seen as opportunistic on the part of traditional residential academic institutions were it not for how closely it matches the new skills required by graduates in the profession and how students are motivated to learn. In a world where routine tasks can be automated into extinction, educational experiences that focus on the non-routine allow students to develop their higher-level thinking skills, as well their ability to interact effectively with the people around them (community-based learning).

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18 Id. at 20.
19 Id. at 21–23.
cation, collaboration, empathy)—as discussed above, these skills will become more and more central to the practice of law in the future.

Finally, there is increasing evidence that creating educational experiences that allow students to be intrinsically motivated results in better learning outcomes. As the name suggests, intrinsic motivation comes from within. In the educational context, it is when students are learning material for its own sake, rather than because of external factors. As part of their self-determination theory, Deci and Ryan suggest three factors that support intrinsic motivation: autonomy, competence, and relatedness. Experiential and project-based learning are often educational experiences that allow for intrinsic motivation. For example, in the Design Nature course described above, the scaffolding of the course allows for development of competence, but students have a considerable amount of autonomy, deciding on their own design goals, the animal they want to build, and so forth. In addition, working in teams within their class and building toys for fourth graders provide relatedness, a sense of purpose derived from being within a community.

As a set of design principles, then, educational experiences can be considered in terms of how they support intrinsic motivation and how they leverage the existing strengths of residential institutions, such as community and hands-on learning, while providing outcomes that help student develop relevant skills and abilities.

THE RELATIONSHIP BETWEEN ENGINEERING AND LAW

Engineering education is in the process of transforming itself from a twentieth century, Cold War model, a set of pedagogical approaches rooted in engineering science, in individual achievement, and in competition, to a twenty-first century student-centered model that emphasizes student motivation, design, innovation, and collabora-

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21 Id. at 56.
22 Id. at 57.
23 See id. at 65 (concluding that “the facilitation of more self-determined learning requires classroom conditions that . . . support the innate needs to feel connected, effective, and agentic as one is exposed to new ideas and exercises new skills[,]” which are often found in experiential and project-based learning).
Olin College was founded in response to this need for transformation and with a mandate to help foster these kinds of pedagogical changes at other institutions.25

Engineering schools were not facing an immediate existential threat. While there are significant, ongoing issues with retention and persistence,26 engineering schools are primarily investigating new pedagogical approaches in order to better equip our graduates for the world into which they are graduating, including global-scale engineering opportunities and challenge.27

As law schools face changing needs for the profession, they have a tremendous opportunity to revamp curricula in ways that serve students, the legal profession, and society as a whole. This includes recognizing that the legal profession will never have less access to technology than it does now, embracing these technologies, and creating educational experiences that allow students to focus on the activities that only humans can do and then taking these skills with them into professional practice.

As a non-lawyer, I believe strongly in the role that lawyers play in our society and that it is in the best interest of our world that law schools and the legal profession weathers this transition in a way that emphasizes the social good that lawyers do. McGinnis writes, “[t]o some degree, engineers—the descendants, really, of blacksmiths—are destined to replace the wordsmiths [lawyers] in society’s commanding heights.”28 As an engineer and a citizen, I find this attempt at insult, as well as the idea that this is a competition for social status, visible. While McGinnis sees a future where technology triumphs through deregulation, I see one where lawyers are the key to crafting, understanding, and overseeing regulation around emerging technological areas, such as online privacy, biotechnology, cybersecurity, climate change, hydraulic fracturing, and other environmental issues, self-driving cars, and other ‘disruptive’ technologies. While the domains and specific needs of the professions might be different, engineering and law grad-

25 Id.
27 See, e.g., Kerns et al., supra note 13, at 4–5.
28 McGinnis, supra note 1.
uates (and society) will all benefit from educations that allow them to collaborate well with others, to use technology effectively, and to think about the larger societal context of their work.