

Towards 2040¹

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Back in the early 21st century, there was huge debate about the educational impact of *computing*, *digitality*, and the *internet*. Two topics garnered the most attention, at least at first. (This beyond the fact that people's imaginations were preoccupied with computing, digitality, and the internet *themselves*—those notions not yet having subsided into presumptive fabric. It's funny how quaint it sounds, these days, to refer to them explicitly.)

The first substantive focus, as the transformation began to take hold, were the books, journals, libraries, and the like. People were aware that the material basis of creative expression was rapidly shifting from marks on paper to configurations of digital arrangement, but had not yet cottoned on to the fact that creative expression itself would take on new forms. As the historians predicted, the initial and ultimately rather recidivist proposals revolved around reproducing, in digital form, ontologies from the print era: *digital libraries*, *online journals*, etc.

Needless to say, it didn't work out that way. The old association of the word 'library' with a delimited collection of materials, to take just one example, had almost vanished by 2020. Except for museological archives of printed material, the very idea of a distinct *collection of works* was inappropriate, derivatively contingent on material form. What replaced that conceit—today's *interpretive catalogues* and *annotated bibliographies*—began to appear in the late teens, but only grew into prominence in the second half of the 2020s.²

The disappearance of journals was also a telling development. Last century, when printing (on paper) was expensive, it had been natural (because efficient) to concentrate normative assessment at the bottleneck in the dissemination process. These processes of assessment were controlled by publishing houses and editors in the commercial sector, and by a formal regimen of peer review in the academy. At the same time, concrete printed tokens of publications, collected in old-fashioned collection-oriented libraries, played the role of providing an archival record. But by the end of the first decade it grew clear that any institution of note could and should maintain its own an AOR (archive of record), which started the process of practices of assessment peeling away from those of publication, which grew essentially free and unmarked.

The *peer review* aspect of journals didn't disappear; but today's wide diversity of forms of *warrant*, on which hiring and promotion decisions are now made, no longer have any association with the act of publishing.³ Note, too, that it was a contingent fact of the era

¹The title will need to change, needless to say. But I like the allusion to impaired vision.

²To say, today, that an article is "online" or "in the cloud" is about as useful a commenting that one has bought a car "in space," or had a relationship with a friend "in time."

³It is striking to recall that there was a time when *Physical Review Letters*, rather than simply being able to release a monthly list of warrants, had to deal with the assembly, formatting, copy-editing, publication, and

of print publication that issues of warrant had to be decided prior to wide-spread reading, making it much more difficult to include commentary, feedback, and role in subsequent discursive engagement within evaluation processes.⁴ Techniques for assembling reactions to expression were pioneered, as was so often true, in the institutions and socio-technical practices of the programmers and technical communities who developed the underlying technologies, in a number of early websites going by such names as *Slashdot*, *Ars Technica*, and *GitHub*. Fearing that it would reduce dispassionate assessment to a popularity contest, the academic community was reluctant to incorporate such feedback, but as was so resoundingly demonstrated by a series of sociological studies in the 2020s, these sifted, normalized, cross-checked patterns of feedback and community assessment (backed by the density of widely-distributed forms of discursive engagement) proved vastly more reliable as indicators of anything that anyone was able to associate with quality, impact, durability, etc., The feedback provided, moreover, was vastly more fine-grained and cross-comparable than earlier methods.

The second topic that garnered attention, especially in the second half of the first decade, was the transformation of *pedagogy*—under an growing appreciation that the ways of teaching and learning were being (and should be) transformed, not just the materials on which it was based. Initially these “innovations in the classroom,” reflected in the rise of online courses, so-called “inverted classrooms,” the spread of laboratory spaces and habits outside of the sciences, etc., remained substantively conservative, in their retention of emphasis on learning as *knowledge acquisition*, and on *content* being what was conveyed and acquired (even if novel and experimental ways). Experimental classrooms flourished, sporting multi-media spectacles, with large numbers of students still confined into a single room using mobile devices designed to mimic smaller, more intimate forms of interaction.

Only in the late teens did it become apparent that the very institutional basis of schooling and education was vulnerable to the relentless epistemic transformation, especially (though by no means exclusively) in what at the time was called “higher” or “post-secondary” education—i.e., in the colleges and universities of the day (aimed at students from about 18 to mid-to-late 20s). Institutional cracks started to appear as early as the late 2010s, catalysed by the juxtaposition of: (i) the rising popularity of moocs (originally named for “massive open online course”); and (ii) the unsustainable rises in the price of university education as traditionally conceived. A sense of crisis enveloped the academy, with pundits both within and without the academy positing or predicting a wide range of developments.

That a wholesale reconfiguration of the educational system was required was widely bruited, especially in the 2020s, but it cannot be said to have taken hold until the early 2030s. Half a dozen developments proved especially catalytic:

distribution of the articles it was recommending.

⁴It is hard to believe, now, that so much weight, for example in processes of hiring and promotion, depended on facts determined prior to distribution and general discussion.

1. The meteoric rise of moocs, starting around 2010;
2. A collaboration aimed at retaining (in some cases: regaining) a focus on seminar-based tutorage and personal mentorship, between private colleges in North America, elite programs in a small number of the best North American Universities, and public education policies in South America and China (both of the latter groups seeing potential, in the new configuration, of leap-frogging the traditionally privileged first-world academy in order to enter the fronts ranks of the new educational regime);
3. Social and economic upheaval in the academy caused by the emergence of an elite group of “star professors”—the ones asked to teach the moocs, leading first to competition, and then (around 2020) to the first waves of high-profile, “free-agent” academics, who in many cases able to command much higher incomes than when employed in traditional universities (to many people’s dismay, the economic structure of the academy quickly began to more closely resemble that of the sports and music worlds);
4. An initially subtle but steadily growing shift of concern in the open-source movement towards education and discursive engagement generally, far beyond their original focus on developing software, which not only led to some innovation, but also put incredible pressure on traditional educational establishments;
5. The development, towards the end of the 2020s and increasing into the 2030s, of platforms that supported thick, richly structured practices of *collaborative discursive engagement*;⁵ and
6. Recognition, soon after moocs started to proliferate, of the need for an entire class of what we now call *stewards*—teachers, most highly concentrated in tertiary school (see below), to act as interpreters of the primary educational streams, who excelled at catalyzing discussion among both physically co-present and geographically dispersed students.

Some of these developments were recognized in the Educational Rationalization Act (ERA), not passed until 2027, which among other things made it mandatory to complete tertiary school,. The overall scheme was based on a logic that had started to emerge over the previous ten years, which in some ways harked back to the development a century earlier of compulsory “high-school” education. In simplest form it can be understood as increasing the number of “stages” of schooling-cum-education from 5 to 6. As a side benefit, it helped to deprecate a number of increasingly tired terms (including ‘un-

⁵The emergence of these platforms, which we now take so thoroughly for granted, depended on a variety of technical developments, of which two were most important: (i) a submersion of the notion of a “link” into the invisible infrastructure of the online world, replaced by vastly more serviceable, general, and usable conceptions of *discursive reference*; (ii) radical generalization of the fundamentally flawed (because local) notion of “annotation” that had initially garnered people’s attention, transforming it into a variety of recursive, symmetrical, socially-mediated forms of participatory engagement.

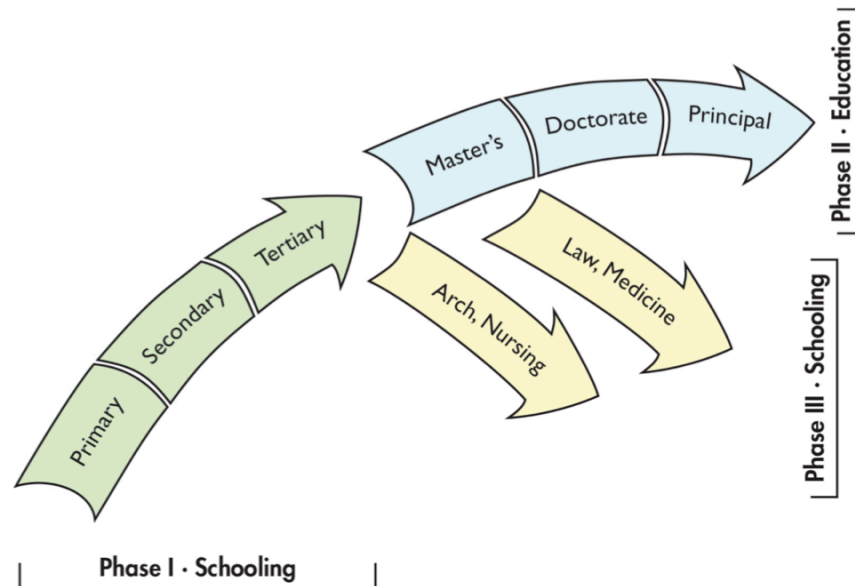


Figure I — Tri-phase Education

dergraduate,' 'post-secondary,' and 'high-school,' none of which, in spite of being common, made much sense, on reflection). The overall structure, which has by now become pretty much the default, is depicted in figure I. It divides the overall pedagogical experience into 3 phases:

1. **Phase I:** *Primary*, *secondary*, and *tertiary* school—aimed at students roughly 4–12, 13–17, and 18–22, respectively. Tertiary school, the most substantial institutional innovation, subsumes both what was earlier called *undergraduate education* in the prior era, as well as colleges, lycées, and community colleges.
2. **Phase II:** *University*, still (as before) consisting of 3 stages, but “shifted up” by one rank, so as to include three degrees:
 - a. *Master’s (M)*—at 2 years, the least changed stage of the whole process.
 - b. *Doctoral (D)*—at a fairly strictly regulated period of 4 years (full time), the logical development of the increasing pressure, felt during the first two decades, of (i) reducing time to completion, (ii) requiring students to enter with a focused project at least partially formed, (iii) widely supported by public funding, etc. Persons obtaining doctorates are generally considered qualified to be stewards (see below), but a doctorate is no longer considered adequate preparation to be a professor.
 - c. *Principal (P)*—a degree that incorporates: (i) the open-ended exploration, time for reflection, etc., of what had once been included within the doctorate, before that degree came under such intense political and economic pressure to

be offered in a way that was “efficient”; (ii) research-oriented postdoctoral fellowships; and (iii) some of what was included in the European structure of a “habilitation.” Principal degrees are unapologetically open-ended, research and/or theoretically oriented—as well as being expensive and extremely competitive. Principals are required for employment as a professor, of which one of the primary consequences is qualification to be a teacher of a mooc.

7. **Phase III: Professional schools**, including law, medicine, architecture, nursing, public health, etc. Professional schools require different levels of education for entry: some (including nursing, architecture, public health, social work, and engineering) require only the completion of tertiary school, and thus do not depend on university education (though the possession of a master’s degree is widely thought to increase chances of admission); others, presently including law and medicine, requires master’s degrees. At present we know of no professional schools which require doctorates or principals.

A number of practices have developed around this new structure:

1. **Teachers** — A general term, as it has always been, but unless otherwise indicated suggestive of a teacher in phase I education (primary, secondary, or tertiary). Minimum qualification usually a master’s.
2. **Stewards** — Interpreters/catalysts of learning and discursive engagement among students in moocs, particularly prevalent in tertiary school (normally qualification is a doctorate).
3. **Professors** — Not entirely unlike (i) the notion of a “professor” in Europe, and (ii) the authors of major text-books: eminent teachers appropriate for world-wide instruction via moocs (usually possessing a principal degree).
4. **Researchers** — Persons with doctorates or principals, whose focus is primarily on discovery, science, etc., but not primarily focused on education *per se*.

... And so on. The real question, though, is whether this exercise is worth pursuing ...