**More Thoughts on MOOCs and the Globalization of Higher Education**

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After listening to a presentation by Daphne Koller, one of the founders of *Coursera*, I was impressed by her emphasis on taking MOOCs beyond content delivery. But I still have a few concerns.

The existing features of MOOCs which currently move course goals into the realm of thoughtful discussion, critical analysis of alternatives, and development of a sense of the specific forms of reasoning and discourse in a field include:

1. Machine-learning algorithms to evaluate fixed-format student production for assignments and problems, far more flexibly than was possible in the past. This allows both automated feedback and automated evaluations, up to a point.

2. Discussion forums (asynchronous threaded discussions), where students interact with peers and may find a wide variety of responses to their contributions.

3. Self-forming study groups and discussion circles, both local face-to-face groups and virtual online groups.

4. Personalization of instruction along the lines of the Intelligent Tutoring Systems program in computer science, where group statistical patterns of errors are analyzed and used to make possible individualized correction and guidance for common misconceptions, and perhaps in other ways.

Of these, (2) and (3) are the ones with the most potential for realizing the higher goals of higher education. But they depend crucially on the quality (as well as the diversity) of the aggregate student enrolment for a course. *Coursera*, according to Koller, currently enrolls primarily students who already have a B.A. or M.A. degree. That means that they already have many of the intellectual and academic skills and habits of mind that enable them not only to benefit from online courses, but also to make contributions that will in turn benefit their peers. This goes a long way towards overcoming the non-scalability of online interaction with an instructor or tutor.

I think we all know that at the later stages of higher education we often learn as much or more from our peers – or at least from arguing with them – as we do from instructors or written materials.

**A key challenge for wider access**

But what happens if the population of MOOC students shifts, as Koller hopes, towards a much broader demographic? So that the typical student might be more like today's community college student, or upper-level secondary school student, rather than someone who has already completed a regular BA or MA curriculum in a traditional university? In such circumstances, it is not so clear that online communities of students will be able to bootstrap their peers in the absence of a skilled and knowledgeable instructor. Neither in online discussion forums nor in self-forming study groups. There will still be some positive peer learning effects, but there are also significant risks that groups will follow persuasive but wrong opinions, or that they will polarize around issues where well-substantiated answers are elsewhere available. And most important of all, I worry that they will not, on their own, even with the limited input of video lectures and exercises, re-discover the spirit and special forms of reasoning and discourse that characterize a discipline.

Why is it better to go to a leading university than a mid-rank or marginally accredited institution? First, because of the quality of the faculty, and of the curriculum that should follow from the faculty's being leaders in their fields (though this doesn't always happen). Second, because of the quality of one's peers among the students: the ways in which their intelligence and intellectual background (a result of selective admissions) make their conversation a better source of good thinking and good ideas. MOOCs can offer wider diversity of views, partly because of their global intake, but without selective admissions or elite tracks, the average quality of the pool of peers will decline with broadening access. We know well enough that such representative pooling still brings benefits for the least prepared students, but much less so for average students, and frequently with negative effects for the most able. With some exceptions.

Most universities today do not in fact offer substantial personal interaction with elite faculty. That only happens in relatively small seminar-style classes taught by such faculty, or in social interactions outside class. Only the most elite universities provide this, and even then not much of it. It is the hallmark of doctoral education in the U.S., the only notable success among higher education's many failures. A few larger universities provide Honors Programs for their best students, which do offer this quality interaction, to some degree. The smaller, expensive liberal arts colleges offer more interaction, but often not with leading researchers. At the earliest stages of higher education, mainly in the first two years, what liberal arts colleges offer is probably good enough. Thereafter, the best students need more extensive interaction with the best creative minds in a field. As presently envisioned, MOOCs do not appear able to meet these needs.

But then neither do many major universities. And here is my second major concern, beyond the scalability of quality in peer-mediated learning: How will universities in the future finance the only form of learning in which they can out-compete MOOCs, namely small seminars with top faculty? Particularly when MOOCs will inevitably replace the large lecture classes, which today subsidize upper-division and graduate classes and also free up faculty time for research?

**A possible solution: Enriching the Mix**

There is another possibility of course. We could promote online learning communities that include a relatively high ratio (and no one know what that ratio ideally should be) of more knowledgeable and experienced students and mature mentors (including faculty, but obviously many more), to insure that peer- and near-peer discussions lead to desirable outcomes and not to the blind leading the blind.

For a very long time our society has accepted the principle of age-grading in education. We rigidly segregate learning groups by age or prior knowledge, despite decades of research that shows that mixed-age groups do better in general for all participants. Most educators do not even know the historical reasons for age-segregation in learning, which had more to do with fears of older students morally corrupting the young, leading them into violence against teachers (this was once rather common, it seems), or abusing them. It's not clear that age-segregation has in fact solved such problems, but rather only displaced them. The modern logic of developmental psychology in favor of the same age-segregation seems to be contravened by actual experience. It is simply not the case that students learn best with others of their own age or of equal attainments in the subject. Nor that, in general, more effective curricula can be devised for homogeneous learning groups. We have such curricula today and they are mostly rather ineffective.

It may be possible to scale up the benefits of MOOCs, if we can discover not just clever ways to support intellectually beneficial peer-interactions, but also the most fertile mixes of age, experience, background, prior knowledge, and academic savvy. This is a kind of research that I do not believe has ever been done. But I think it is the essential line of research to develop technology-enhanced learning arrangements that are as scalable as they can be, when their goals go as far beyond content delivery as we can make them.

**Multipliers for Intellectual Quality**

Finally, what might be the role of faculty in an educational system where content delivery becomes the province of MOOCs? Apart from the important, but scale-limited role of engaging with them in small seminar-sized groups? I believe that it may well be that our role in the future will be in training mentors and online tutors who will play a critical role in ensuring the quality of discussions in online forums within the MOOC model, and perhaps in MOOC-inspired face-to-face local groups. It is not clear if a single "generation" multiplier effect will be sufficient for the expected scale of MOOCs and so for the numbers of such mentors/tutors needed. It may be that beyond this, faculty will need to be the teachers of teachers of teachers, preparing those who will in turn prepare the large numbers of online mentors/tutors. Our role will be quality assurance, not by monitoring quality in online discussions directly, but by preparing others who can do so.

I envision a wide range of peer-, near-peer, and more experienced and able mentors working with MOOC students. Beginning with those who join MOOC

classes, as at present, with more knowledge and experience, better prepared for the course than others. Then adding to these graduates of the course who, for some consideration, whether of reputation or remuneration (in cash or in kind), participate as mentors. And in smaller numbers but still large in the aggregate, specially trained tutor-mentors, both knowledgeable in the subject and in the arts of leading discussions toward deeper understanding and critical analysis. It is these whom we will need faculty expertise to prepare. They will form a category of higher educator intermediate between teaching faculty in a university and today's part-time instructors or graduate teaching assistants. They will likely need to prepare both by working with full-time faculty and by apprenticing to more experienced mentor-tutors in online environments. It is hard to say whether such a profession would provide full-time employment, nor need it. In a world of universal higher education access for billions of global citizens, many of us will need to play some part-time role in higher education.

**Re-engineering Higher Education Finance in a Global Market**

This is only one possible vision, though it seems to me to meet some of the criteria needed for a viable way forward combining MOOCs and transformed universities. A re-distribution of the division of labor, acknowledging the superiority of MOOCs in optimizing the quality of content delivery and maximizing access and diversity, and also the necessity of small-group interaction with more able students and mentors/tutors, and ultimately with faculty, to insure the higher goals of higher education.

What is not clear, however, is what financial model will support any such future for higher education. I believe it is likely that the global competition to attract the most talented students (and to use wide-access MOOCs to identify them) will lead to the end of paid tuition for all degree programs. The economic benefits to regions that offer free higher education to qualified students will re-pay the costs many times over. And those that recognize this first will gain substantial competitive advantage. Already state-supported universities in Germany are both offering degree programs entirely in English and extending their free-tuition policy for their own nationals to foreign students as well. Even without MOOCs.

US higher education urgently needs to promote the development of a range of alternative visions of both its educational and business models for what is almost certainly going to be a radically different future.