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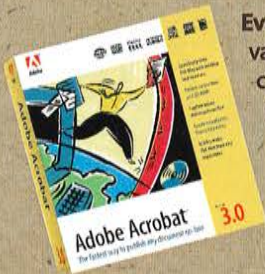
July/August 1996
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Eli Noam

ON THE FUTURE OF THE UNIVERSITY



Eli M. Noam is professor of finance and economics at the Columbia University Graduate School of Business and director of the Columbia Institute for Tele-Information. His expertise in telecommunications policy matters has earned him a stint as a New York State Public Service Commissioner engaged in telecommunications and energy regulation, and service as a board member for the federal government's FTS-2000 telephone network, the IRS's computer modernization project, and the National Computer Lab. Noam has published widely on domestic and international telecommunications, television, information and regulation topics, and forthcoming books include *Connecting the Networks of Networks* and *The Last Bottleneck of the Information Revolution: Competing for Attention Span*.

EDUCOM REVIEW: In *Science*, October 13, 1995, you wrote:

"In the past, people came to the information, which was stored at the university. In the future, the information will come to the people, wherever they are. What then is the role of the university? Will it be more than a collection of remaining physical functions, such as the science laboratory and football team? Will the impact of electronics on the university be like that of printing on the medieval cathedral, ending its central role in information transfer? Have we reached the end of the line of a model that goes back to Nineveh, more than 2500 years ago? Can we self-reform the university, or must things get much worse first?"

Could things really get much worse? How would they get worse?

ELI NOAM: Partly as a consequence of the shock created by Sputnik, the American university system enjoyed a Golden Age in which it had money, students, prestige and respect for its educational mission. But now that system is being squeezed from a variety of directions and it will quite possibly deteriorate into the kind of genteel poverty which characterizes many of the European universities. So how could things get worse? In the competition for dollars and for students, standards will drop, class sizes will increase, faculties will moonlight, and Nobel Prize research will migrate to industrial labs.

ER: Are those things already happening?

NOAM: Sure. It's not the early '60s anymore. But soon, electronics can bypass the universities altogether,

which reduces the pressure on society to rescue them.

ER: You express a hope for self-reform. What would self-reform look like?

NOAM: Reform may include a far-reaching structural administrative reorganization, breaking up the university into its component functions—credentialing; guidance; knowledge generation; instruction; and housekeeping. There will be a significant outsourcing of the latter two functions. There will also be an export of electronic courses beyond the traditional student population. In course provision, we will see much less of the traditional lecture system, which is a very inefficient way to accomplish the information transmission function of education. We will also see, in successful universities, an expansion of the guidance function, more of the tutorial, hands-on, mentoring-type activities that direct human contact provides best.

ER: In breaking academic activities up into component functions, would you entirely divorce the credentialing function from the instructional function?

NOAM: Of course there will continue to be an interplay between those two functions. The credentialing function means that the university certifies, by awarding a diploma, that the student has achieved proficiency in a field—irrespective of how the person accomplished that feat. Proficiency can be achieved in a variety of ways, and through a variety of institutions, and the university can recognize courses or other learning obtained elsewhere, including electronic courses "imported" by the student. The academic institution would, in effect, say, "these are the subjects you must master. Show up

whenever you are ready. We will offer you several courses in the field, but you can also go elsewhere."

ER: You say "we" will. You still see that as the function of an individual college or university, rather than, say, as the function of a national accrediting agency?

NOAM: Credentialing should remain a function of a college or university. The decentralized American university system has actually worked quite well, and offers diversity and choice. An external accreditation system can create a floor, if necessary.

ER: But that external accreditation system is superimposed on that of the academic institution, rather than meant to serve as a replacement for it, right?

NOAM: Right. But the institutions are perfectly capable of handling the credentialing function by themselves. Naturally, you want to prevent the charlatanism of the kind of academic degree you get from those advertising on the back of a matchbook, but usually the world can evaluate people's credentials appropriately. Selectivity is a major asset.

ER: You mentioned the economic reasons for changing the college or university. What about non-economic reasons? Absent compelling economic reasons, would the Aristotle-Alexander master-student relationship be the ideal learning model?

NOAM: Yes, for many students. But today's professorate cannot be expected to play that role. There has been an information explosion in all fields of study. And that means that specialists in many fast-moving fields communicate

“Many of the physical mega universities, on the other hand, are not sustainable, at least not in their present duplicative variations.”

far more with each other than with their colleagues on campus, let alone with “mere” students.

ER: And so let’s talk a minute about the “slow-moving fields,” though they might or might not want to characterize themselves that way. But let’s say: Greek Philosophy.

NOAM: Some disciplines have a strong core of commonality and will consequently stay strong in traditional academic collaboration. But leading edge, fast-moving sciences will move into virtual departments of sub-specialties.

ER: A number of people have concerns about a lack of distinction between so-called “education” (thought to be relatively permanent) versus so-called “technical training” (thought to be relatively ephemeral). What are your thoughts on that?

NOAM: This leads us to define what a university’s true advantages are in the educational process. The teaching function includes a number of components which cannot be delegated to machines. The more we look at education, the more we must respect the historic ways of early universities, with the scholar surrounded by disciples in an intense interrelation. This should be the university’s strength. But it is also very expensive. Technical training, on the other hand, often lends itself to standardization and therefore to automation by intelligent machines.

ER: What has been the reaction to your ideas from people at your own university—faculty, students and administrators?

NOAM: I’ve received hundreds of

responses both from people at my own university and from around the world. Most have been gratifyingly encouraging. In a few cases the reactions have been negative, but largely from a misunderstanding that I am advocating “virtual universities” rather than expecting them, which is a more neutral type of observation. Columbia, as an Ivy League university with a very small college, is more protected against the winds of change than many other institutions because personal mentoring has always been one of its strengths. Because of the value of its degrees, there will always be good students coming to Columbia, and they will benefit each other through peer experience. The problems of electronic alternatives offered by commercial providers at a fraction of the price are more urgent at large public universities, whose budgets are politically determined.

ER: So you expect virtual universities to flourish?

NOAM: I expect virtual degree programs to flourish because they will be, in terms of the tuition price to the students, and the effectiveness of their “production,” a good deal. That is inevitable. The only question is whether these courses will

still be embedded in a university-credentialed degree, or whether they will lead to acceptable stand-alone degrees by, say, a “McGraw-Hill University.” On top of that, at the high end of education, those invisible colleges of specialists linked to each other by electronic means are likely to issue certificates for mastery of their sub-specialty. The development of virtual degrees may be slowed down by problems of accreditation and other hurdles, but they represent the essential direction in which mass higher education will be changing.

Of course, people scornful of those trends take solace by remembering the incorrect predictions about the educational roles of television or programmed instruction. But just because things haven’t happened in the past doesn’t mean that a vastly superior technology will not be effective in the future. Many societal activities will be tremendously impacted by information technology, and higher education is only one example. Traditional commercial banks, for example, will be in even greater trouble. It’s usually easier to recognize inevitable change for others than for oneself.

ER: There’s an urgency in your message. How would you express that urgency to, first, a university president—either Columbia or a public university—and then to a small liberal arts college?

NOAM: Institutions have a hard time self-reforming unless they are forced to do so by crisis. On top of that, to put it charitably, universities have a governance structure that is diffuse. In many respects universities are worker-run enterprises, with the workers being the faculty. Tenured faculty set much of

Ten years from now a significant share of conventional mass education will be offered commercially and electronically.”

the policy of the university, and they tend to be people who have grown up in its style and tradition. Don't get me wrong, I like this tradition. The question is only whether it can be maintained in the future. Reform may come from some far-sighted university presidents, deans and faculty committees. They must share a sense of urgency to create new models, in the same way that some universities around the turn of the century reformed themselves: Harvard under Eliot and Conant, or Chicago under Hutchins. Some foundation money would help to set models that could be copied around the country. That kind of leadership is needed now. But it's scarce.

The second push for leadership probably will come from the commercial sector, from publishing and other media companies. An example is Glenn Jones' Intercable, which has already established an alternative electronic model, the International University College. Commercial organizations have fewer (or other) sacred cows, and will change some things in radical ways, such as total reliance on moonlighting, piece-working, contract teachers. Traditional faculty will hate this, but state legislators won't.

ER: What would you tell the very small liberal arts colleges?

NOAM: The future small liberal arts colleges look strong because they traditionally provide the mentoring, hands-on, tutorial-based education. Many of the physical mega-universities, on the other hand, are not sustainable, at least not in their present duplicative variations.

ER: The universities are not sustainable?

NOAM: The huge institutions? No, I don't think so. Because a large part of their function is mass information-transfer, which is taken up much more cheaply by electronic distribution systems and by other institutions. This does not mean a literal closing or bankruptcy of universities, although some of this will surely happen. More likely is a gradual shrinking, and a reduction of respect.

ER: Let's end with a prediction. What do you think will happen in the next ten years or twenty years?

NOAM: Commercial electronic degrees have started already. I would say that ten years from now a significant share of conventional mass education will be offered commercially and electronically. On the other hand, this is also an opportunity for early innovators. An institution that does so early and well can become the "University of North America," and serve the entire world. Higher education, after all, is one of America's major export successes. In the age of information, information institutions will be more important than ever. The question is only how central the traditional institutions of knowledge, the universities, will be. **ER**

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Vint Cerf on the World Wide Web

Part II

E.R.: Do you see laptops evolving to the point where people would use them to read books?

Cerf: I believe so, because I do it myself.

E.R.: You do?

Cerf: I do and my wife does it today. I don't say every book I read is on the laptop. In most cases, I couldn't get it online anyway if I wanted to. But I'd point out that if I actually have sufficiently eclectic reading habits and I'm reading four or five books at a time, then carrying all of the texts in the laptop, along with all my megabytes of e-mail, is actually a lot more convenient than carrying the books around. Moreover, the font size can be adjusted instead of having to wear bifocals, and it is self-illuminating so you don't have to keep your partner awake by leaving the light on at night. So all those various things make it extremely attractive to me. I found