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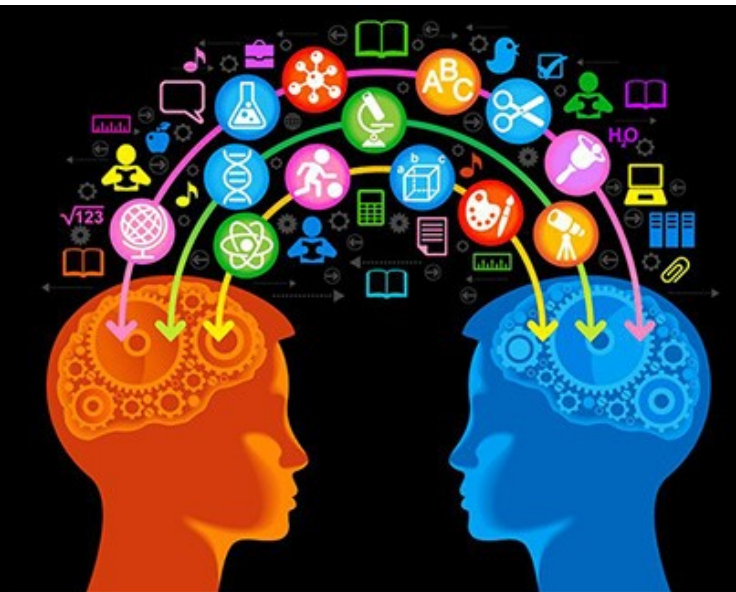## INNOVATION

Can the Minerva Model of Learning Disrupt Higher Education?

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Traditional universities — including Ivy League schools — fail to deliver the kind of learning that ensures employability. That perspective inspired Ben Nelson, founder and CEO of the six-year-old Minerva Schools in San Francisco. His goal is to reinvent higher education and to provide students with high-quality learning opportunities at a fraction of the cost of an undergraduate degree at an elite school. While tuition at top-tier universities in the U.S. can run more than $40,000 a year, Minerva charges $12,950 a year, according to its website. In a recent test, its students showed superior results compared to traditional universities while also attracting a large number of applicants.

Minerva is a disruptor and the traditional university establishment needs to adapt to its model and perhaps improve on it, according to Jerry (Yoram) Wind, emeritus marketing professor at Wharton. Nelson, who was previously president of Snapfish, an online photo hosting and printing service, and Wind spoke to Knowledge@Wharton about why the higher education model needs to change, and how the Minerva model could help.

An edited transcript of the conversation follows.

Knowledge@Wharton: Jerry, where is the future of education headed?

Jerry Wind: The future is now. It has been here for a while, and with Minerva, Ben has recreated the university of the future. Ben, describe briefly the Minerva concept, and then go into the recent findings of the CLA report (Minerva's Collegiate Learning Assessment test).

Ben Nelson: We refer to Minerva as having been built as an "intentional university." Everything about the design of the institution, what we teach, how we teach and where we teach it is based on what we know, and through empirical evidence, is effective.

In what we teach, we are classical in our approach, even though we're [also] modern and progressive in the way we teach. For example, if you think about the purpose of a liberal arts education, or what the great American universities purport to teach, they will say 'We teach you how to think critically, how to problem-solve, how to think about the way the world works and to be global, and how to communicate effectively.

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–Ben Nelson

When you actually look at how universities attempt to do it, they basically teach you academic subject matter and they hope you pick up all of the other stuff by accident.

We decided to have a curriculum that teaches these things, that breaks down critical thinking, creative thinking, effective interactions, and effective communications into component parts. [We wanted to make] sure that we don't just teach them conceptually, and don't just teach them in a context, but actually explain the concept and then have our students apply them actively from context to context to context.

Knowledge@Wharton: Could you share an example of how you do that?

Nelson: One aspect of critical thinking, for example, is evaluating claims. There are various ways of evaluating claims. Sometimes you use logic, sometimes you use reasoning, which is different than logic, sometimes you do statistical analysis which is different than the other two, and sometimes you just think of a counter example.

Now there are different [types] of critical thinking. One example: making a decision tradeoff. Should we go down Path A or Path B? The technique for making a decision tradeoff is perhaps thinking through the cost-benefit analysis, which is a type of critical thinking.

If you say 'I'm going to teach you critical thinking' and you just try to teach it as a thing you will never succeed. [It is important to] go through it systemically and do the component parts – that's the first aspect.

The second aspect is if you teach a person an idea, say evaluation of claims, the mind gets trained in a particular context. When somebody makes a claim, let's say on an investment opportunity, or a political claim, the mind doesn't really transfer those skills from one field to another. This is one of the fundamental problems of transferrable education. The way that you teach that is to provide exercise and applications in multiple fields.

How we teach is also radically different. The science of learning shows that the dissemination of information [through] lectures and test-based methodology simply doesn't work. Six months after the end of a traditional lecture and test-based class, 90% of the material you were supposed to have learned is gone from your mind. In an active learning environment you struggle through information, and two years after the end of the class you retain 70%.

All of our classes, despite [being] small seminars with 15 to 19 students at a time, are done via live video online where there's a camera pointed at every student's face. The students are actively engaged with the materials, [and it is] not the professor lecturing — professors are not allowed to talk for more than four minutes at a time. The students get feedback on how they apply what they [learn].

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Lastly [it is about] where we teach. We have created a university that takes advantage of the best the world has to offer. Being a Penn graduate, I always gravitated towards the idea of the urban campus. Our students live in the heart of cities in residence halls together, and have a very strong community. They spend their first year in the heart of San Francisco, but over the next three years across six semesters, as a cohort, as a group, they will travel and live in six different countries. So in their second year they go to Seoul and Hyderabad, and then to Berlin and Buenos Aires, then London and Taipei, and come back to San Francisco for a month to manifest their education and graduate.

Wind: While the concept is appealing, does it work? Describe the CLA test, and then talk about the implications of [your approach].

Nelson: The Collegiate Learning Assessment is provided by a third party nonprofit that has been testing and assessing students' progress on critical thinking, problem-solving, scientific reasoning and effective communication skills for many years. It's been administered to hundreds of thousands of students across hundreds of universities. It is administered to students at the beginning of their first year and at the end of their fourth year, and so you can measure [the] progress of students.

We provided [our students] the first-year test just before they started the first class at the beginning of the year. But rather than waiting four years, we gave our students the fourth-year test at the end of their first year, Eight months later, the results shocked us. Not only did our students after eight months have the highest composite score in the country compared to any other university that was assessing their students, the delta improvement they accomplished was higher than what the CLA has seen any university accomplish over four years.

Knowledge@Wharton: What drove those results?

Nelson: The silly answer would be to say, 'Oh we're brilliant and we're great, and look at how amazing what we do is.' The fact of the matter is we've got a lot of room to grow and improve. These results in many ways are much more damning of the existing system than they are generating praise for our brilliance.

We have taken publicly available scientifically published data on how the mind works. We've broken down the things that every university says that they teach or that they want to teach, and merely spent time putting together a curriculum that does that, and we've offered it to students. We've just done what anybody who would rationally approach trying to create a solution to a problem do.

I would bet you that if you had 100 institutions or 100 groups of people that were to do the same thing we would have done from scratch, we would have probably been better than some of them, maybe most of them, but not all of them. There would be some that on their first try would be even better than [us].

Wind: This is the value of idealized design. As opposed to trying to fix the current educational system by adding another course or trying to create a cross-disciplinary course, [Minerva] reexamines the whole purpose of education.

They didn't go far enough, which is they are still within an academic context, and probably they will relax the academic context that is [with] semesters and the like, and get even better results. But even within this academic context and constraints, what they have done is amazing – the curriculum, the concept, and the way it's developed for the benefit of the learner, and not the benefit of the faculty.

The [first] implication is, if you had a choice and you wanted to go to a university now, where would you go? If you want really great education, go to Minerva; [but if] you want to network, go to one of the top five schools — Penn, Harvard, Princeton, Yale and MIT. Minerva offers probably a different network than the traditional ones because it is a network of people who are willing to do it.

Nelson: Last year, for our third class ever, we received 20,400 applications. That is more applicants than MIT or Dartmouth got. The network you get in a Wharton or Harvard or Yale or what-have-you is [of] a certain kind. It is overwhelmingly American, [with] 80% or 90% from the U.S., and usually from particular socioeconomic backgrounds. Even though there is some diversity, it's heavily weighted [in favor of that profile].

The Minerva network is radically different because 80% of our students are not from the U.S. — they come from 61 countries. We received these 20,000 applications from 179 countries. The experience and the network you build as you travel and live as a resident in these seven countries is unparalleled. If you want a global footprint, that's what we provide.

Wind: The current educational system does not work. Implication two is that [universities] have to realize that they are being disrupted. At this stage [it is on a] small scale, but if other universities start adopting it, it can [become] large scale. [Minerva is] the disruptor here, and the signal to the legacy universities is, our model does not work. Stop trying to fix it by adding another Band-Aid, but try to rethink the educational system. And here you have a wonderful blueprint that works.

Nelson: We just wrote a book called *Building the Intentional University*, which is a blueprint for how other universities can create their own Minervas or reform in that sense. We are a residential university that grants undergraduate degrees with 120 credit hours, with majors and minors and electives and a general education curriculum. We are plug-and-play for universities. We offer potential salvation from disruption.

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What I have worried about is the other kind of disruptive force that can attack universities [and be] destructive, in the sense that in six months you get a high school degree, go to a boot camp and then get a six-figure job being a software programmer. We have put together an educational experience that enables university graduates to be better prepared than [with that] six-month boot camp. Because they are able to do higher level problem solving, they are going to be [software] architects as opposed to the programmers. They're going to the ones that in a world of Watson and artificial intelligence and outsourcing are going to be much more future-proof.

Wind: An increasing number of people view employability as being critical, and a traditional university degree does not guarantee employability, [but] the new non-degree programs guarantee you a [job] position.

Knowledge@Wharton: Three or four years ago, a big potential disruptor was the so-called MOOC, or the Massive Open Online Course. A number of platforms came up [such as] Coursera, Udacity and EdX. It seemed like they were going to be disruptive, but that doesn't seem to have happened. What happened with that so-called disruption and why did it fail?

Nelson: The jury is still somewhat out on that, and let me give you an example of what I think is happening on the surface. MIT had a master's program in supply chain logistics, and it cost $60,000 for a two-semester program. As an experiment, [they put the] first semester on MOOCs, and rather than charging $30,000 for it, [gave] it away for free. If you want to get credit for it pay

$250, [write] an exam, and then if you score well you [go] to campus, do a one-semester supplement, pay $30,000 and get a master's degree.

This [halves] the cost of higher education for a master's degree. Imagine if the Ivy League – or any university – [extended that to] all the courses they give academic credit for. Of the $250,000 that they are used to collecting and are reliant on [for each degree course, they] can only collect $100,000 because $150,000 is effectively given away for free. So far no university has an incentive to rock the boat too much on this. [However,] just because the disruption does not happen immediately doesn't mean it won't happen.

Wind: The concern is that especially for the leading universities, it's an excuse not to innovate. They are saying, 'Look how innovative we are; we have MOOCs, or we offer classes on Coursera,' and basically the rest of the education stays exactly the same way as it was before. Some of the findings suggest that less than 5% of the people who start ever finish the courses on Coursera or EdX. But there are some encouraging signs that if you add to the traditional Coursera course or EdX interaction, and if you provide some more gamification principles in terms of getting involved, you can increase the numbers significantly.

The advantage of this — with MIT, Stanford, Penn and other universities putting all of these courses online — is that the role of the faculty becomes easier as a curator. This is the fundamental change that we have to see in education.

Knowledge@Wharton: [In addition to] a network, one other factor that the Ivy League universities offer is the brand. When you have this innovative model like Minerva, how do you establish a brand that is acceptable to students as well as employers?

Nelson: Minerva was built as a positive brand. When you meet somebody at Minerva you know that they have … been given systematic frameworks of analysis that they can apply effectively to the rest of the world. Our challenge is to propagate that brand, to get people aware of it. The good news is that the internet is a very good way of disseminating information. Brand building in today's world doesn't take centuries; it doesn't even take decades.

Wind: The final word on branding is always [from] the consumer. One, the best carrier of the brand, and especially on the positive side, would be the alumni. So the value of the degree, the value of the Minerva experience is a function of how good the alumni are. Two, a lot [depends] of the employability and demand for the Minerva students.

Nelson: It's too early to tell.