The Atlantic

Features: The Future of College?

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A brash tech entrepreneur thinks he can reinvent higher education by stripping it down to its essence, eliminating lectures and tenure along with football games, ivy-covered buildings, and research libraries. What if he's right?

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August 13, 2014

On a Friday morning in April, I strapped on a headset, leaned into a microphone, and experienced what had been described to me as a type of time travel to the future of higher education. I was on the ninth floor of a building in downtown San Francisco, in a neighborhood whose streets are heavily populated with winos and vagrants, and whose buildings host hip new businesses, many of them tech start-ups. In a small room, I was flanked by a publicist and a tech manager from an educational venture called the Minerva Project, whose founder and CEO, the 39-year-old entrepreneur Ben Nelson, aims to replace (or, when he is feeling less aggressive, “reform”) the modern liberal-arts college.

Minerva is an accredited university with administrative offices and a dorm in San Francisco, and it plans to open locations in at least six other major world cities. But the key to Minerva, what sets it apart most jarringly from traditional universities, is a proprietary online platform developed to apply pedagogical practices that have been studied and vetted by one of the world’s foremost psychologists, a former Harvard dean named Stephen M. Kosslyn, who joined Minerva in 2012.

Nelson and Kosslyn had invited me to sit in on a test run of the platform, and at first it reminded me of the opening credits of *The Brady Bunch*: a grid of images of the professor and eight “students” (the others were all Minerva employees) appeared on the screen before me, and we introduced ourselves. For a college seminar, it felt impersonal, and though we were all sitting on the same floor of Minerva’s offices, my fellow students seemed oddly distant, as if piped in from the International Space Station. I half expected a packet of astronaut ice cream to float by someone’s face.

Within a few minutes, though, the experience got more intense. The subject of the class—one in a series during which the instructor, a French physicist named Eric Bonabeau, was trying out his course material—was inductive reasoning. Bonabeau began

by polling us on our understanding of the reading, a *Nature* article about the sudden depletion of North Atlantic cod in the early 1990s. He asked us which of four possible interpretations of the article was the most accurate. In an ordinary undergraduate seminar, this might have been an occasion for timid silence, until the class's biggest loudmouth or most caffeinated student ventured a guess. But the Minerva class extended no refuge for the timid, nor privilege for the garrulous. Within seconds, every student had to provide an answer, and Bonabeau displayed our choices so that we could be called upon to defend them.

Bonabeau led the class like a benevolent dictator, subjecting us to pop quizzes, cold calls, and pedagogical tactics that during an in-the-flesh seminar would have taken precious minutes of class time to arrange. He split us into groups to defend opposite propositions—that the cod had disappeared because of overfishing, or that other factors were to blame. No one needed to shuffle seats; Bonabeau just pushed a button, and the students in the other group vanished from my screen, leaving my three fellow debaters and me to plan, using a shared bulletin board on which we could record our ideas. Bonabeau bounced between the two groups to offer advice as we worked. After a representative from each group gave a brief presentation, Bonabeau ended by showing a short video about the evils of overfishing. ("Propaganda," he snorted, adding that we'd talk about logical fallacies in the next session.) The computer screen blinked off after 45 minutes of class.

The system had bugs—it crashed once, and some of the video lagged—but overall it worked well, and felt decidedly unlike a normal classroom. For one thing, it was exhausting: a continuous period of forced engagement, with no relief in the form of time when my attention could flag or I could doodle in a notebook undetected. Instead, my focus was directed relentlessly by the platform, and because it looked like my professor and fellow edu-nauts were staring at me, I was reluctant to ever let my gaze stray from the screen. Even in moments when I wanted to think about aspects of the material that weren't currently under discussion—to me these seemed like moments of creative space, but perhaps they were just daydreams—I felt my attention snapped back to the narrow issue at hand, because I had to answer a quiz question or articulate a position. I was forced, in effect, to learn. If this was the education of the future, it seemed vaguely fascistic. Good, but fascistic.

Minerva's headquarters are in San Francisco, and the first class of students will live in a dorm there this year, but the university plans to open locations in at least six other cities, including Berlin and Buenos Aires. (Ike Edeani)

Minerva, which operates for profit, started teaching its inaugural class of 33 students this month. To seed this first class with talent, Minerva gave every admitted student a full-tuition scholarship of $10,000 a year for four years, plus free housing in San Francisco for the first year. Next year's class is expected to have 200 to 300 students, and Minerva hopes future classes will double in size roughly every year for a few years after that.

Those future students will pay about $28,000 a year, including room and board, a $30,000 savings over the sticker price of many of the schools—the Ivies, plus other hyperselective colleges like Pomona and Williams—with which Minerva hopes to compete. (Most American students at these colleges do not pay full price, of course; Minerva will offer financial aid and target middle-class students whose bills at the other schools would still be tens of thousands of dollars more per year.) If Minerva grows to 2,500 students a class, that would mean an annual revenue of up to $280 million. A partnership with the Keck Graduate Institute in Claremont, California, allowed Minerva to fast-track its accreditation, and its advisory board has included Larry Summers, the former U.S. Treasury secretary and Harvard president, and Bob Kerrey, the former Democratic senator from Nebraska, who also served as the president of the New School, in New York City.

Nelson's long-term goal for Minerva is to radically remake one of the most sclerotic sectors of the U.S. economy, one so shielded from the need for improvement that its biggest innovation in the past 30 years has been to double its costs and hire more administrators at higher salaries.

The paradox of undergraduate education in the United States is that it is the envy of the world, but also tremendously beleaguered. In that way it resembles the U.S. health-care sector. Both carry price tags that shock the conscience of citizens of other developed countries. They're both tied up inextricably with government, through student loans and federal research funding or through Medicare. But if you can afford the Mayo Clinic, the United States is the best place in the world to get sick. And if you get a scholarship to Stanford, you should take it, and turn down offers from even the best universities in Europe, Australia, or Japan. (Most likely, though, you won't get that scholarship. The average U.S. college graduate in 2014 carried $33,000 of debt.)

Some claim education is an art and a science. Nelson has disputed this: "It's a science and a science."

Financial dysfunction is only the most obvious way in which higher education is troubled. In the past half millennium, the technology of learning has hardly budged. The easiest way to picture what a university looked like 500 years ago is to go to any large university today, walk into a lecture hall, and imagine the professor speaking Latin and wearing a monk's cowl. The most common class format is still a professor standing in front of a group of students and talking. And even though we've subjected students to lectures for hundreds of years, we have no evidence that they are a good way to teach. (One educational psychologist, Ludy Benjamin, likens lectures to Velveeta cheese—something lots of people consume but no one considers either delicious or nourishing.)

In recent years, other innovations in higher education have preceded Minerva, most famously massive open online courses, known by the unfortunate acronym MOOCs. Among the most prominent MOOC purveyors are Khan Academy, the brainchild of the entrepreneur Salman Khan, and Coursera, headed by the Stanford computer scientists Andrew Ng and Daphne Koller. Khan Academy began as a way to tutor children in math,

but it has grown to include a dazzling array of tutorials, some very effective, many on technical subjects. Coursera offers college-level classes for free (you can pay for premium services, like actual college credit). There can be hundreds of thousands of students in a single course, and millions are enrolled altogether. At their most basic, these courses consist of standard university lectures, caught on video.

But Minerva is not a MOOC provider. Its courses are not massive (they're capped at 19 students), open (Minerva is overtly elitist and selective), or online, at least not in the same way Coursera's are. Lectures are banned. All Minerva classes take the form of seminars conducted on the platform I tested. The first students will by now have moved into Minerva's dorm on the fifth floor of a building in San Francisco's Nob Hill neighborhood and begun attending class on Apple laptops they were required to supply themselves.

Each year, according to Minerva's plan, they'll attend university in a different place, so that after four years they'll have the kind of international experience that other universities advertise but can rarely deliver. By 2016, Berlin and Buenos Aires campuses will have opened. Likely future cities include Mumbai, Hong Kong, New York, and London. Students will live in dorms with two-person rooms and a communal kitchen. They'll also take part in field trips organized by Minerva, such as a tour of Alcatraz with a prison psychologist. Minerva will maintain almost no facilities other than the dorm itself—no library, no dining hall, no gym—and students will use city parks and recreation centers, as well as other local cultural resources, for their extracurricular activities.

Lectures, Kosslyn says, are cost-effective but pedagogically unsound. "A great way to teach, but a terrible way to learn."

The professors can live anywhere, as long as they have an Internet connection. Given that many academics are coastal-elite types who refuse to live in places like Evansville, Indiana, geographic freedom is a vital part of Minerva's faculty recruitment.

The student body could become truly global, in part because Minerva's policy is to admit students without regard to national origin, thus catering to the unmet demand of, say, prosperous Chinese and Indians and Brazilians for American-style liberal-arts education.

The Minerva boast is that it will strip the university experience down to the aspects that are shown to contribute directly to student learning. Lectures, gone. Tenure, gone. Gothic architecture, football, ivy crawling up the walls—gone, gone, gone. What's left will be leaner and cheaper. (Minerva has already attracted $25 million in capital from investors who think it can undercut the incumbents.) And Minerva officials claim that their methods will be tested against scientifically determined best practices, unlike the methods used at other universities and assumed to be sound just because the schools themselves are old and expensive. Yet because classes have only just begun, we have little clue as to whether the process of stripping down the university removes something essential to what has made America's best colleges the greatest in the world.

Minerva will, after all, look very little like a university—and not merely because it won't be accessorized in useless and expensive ways. The teaching methods may well be optimized, but universities, as currently constituted, are only partly about classroom time. Can a school that has no faculty offices, research labs, community spaces for students, or professors paid to do scholarly work still be called a university?

If Minerva fails, it will lay off its staff and sell its office furniture and never be heard from again. If it succeeds, it could inspire a legion of entrepreneurs, and a whole category of legacy institutions might have to liquidate. One imagines tumbleweeds rolling through abandoned quads and wrecking balls smashing through the windows of classrooms left empty by students who have plugged into new online platforms.

The Minerva offices—where all employees work at open-plan stations—recall a typical tech start-up far more than they do an academic building. (Ike Edeani)

The decor in the lobby of the Minerva office building nods to the classical roots of education: enormous Roman statues dominate. (Minerva is the Roman goddess of wisdom.) But where Minerva's employees work, on the ninth floor, the atmosphere is pure business, in a California-casual sort of way. Everyone, including the top officers of the university, works at open-plan stations. I associate scholars' offices with chalk dust, strewn papers, and books stacked haphazardly in contravention of fire codes. But here, I found tidiness.

One of the Minerva employees least scholarly in demeanor is its founder, chief executive, and principal evangelist. Ben Nelson attended the University of Pennsylvania's Wharton School as an undergraduate in the late 1990s and then had no further contact with academia before he began incubating Minerva, in 2010. His résumé's main entry is his 10-year stint as an executive at Snapfish, an online photo service that allows users to print pictures on postcards and in books.

Nelson is curly-haired and bespectacled, and when I met him he wore a casual button-down shirt with no tie or jacket. His ambition to reform academia was born of his own undergraduate experience. At Wharton, he was dissatisfied with what he perceived as a random barrage of business instruction, with no coordination to ensure that he learned bedrock skills like critical thinking. "My entire critique of higher education started with curricular reform at Penn," he says. "General education is nonexistent. It's effectively a buffet, and when you have a noncurated academic experience, you effectively don't get educated. You get a random collection of information. Liberal-arts education is about developing the intellectual capacity of the individual, and learning to be a productive member of society. And you cannot do that without a curriculum."

Students begin their Minerva education by taking the same four "Cornerstone Courses," which introduce core concepts and ways of thinking that cut across the sciences and humanities. These are not 101 classes, meant to impart freshman-level knowledge of subjects. ("The freshman year [as taught at traditional schools] should not exist," Nelson says, suggesting that MOOCs can teach the basics. "Do your freshman year at home.")

Instead, Minerva's first-year classes are designed to inculcate what Nelson calls "habits of mind" and "foundational concepts," which are the basis for all sound systematic thought. In a science class, for example, students should develop a deep understanding of the need for controlled experiments. In a humanities class, they need to learn the classical techniques of rhetoric and develop basic persuasive skills. The curriculum then builds from that foundation.

"Minerva brings us back to first principles," says Harry R. Lewis, a former Harvard dean. What, he asks, does it mean to be educated?

Nelson compares this level of direction favorably with what he found at Penn (curricular disorder), and with what one finds at Brown (very few requirements) or Columbia (a "great books" core curriculum). As Minerva students advance, they choose one of five majors: arts and humanities, social sciences, computational sciences, natural sciences, or business.

Snapfish sold for $300 million to Hewlett-Packard in 2005, and Nelson made enough to fund two years of planning for his dream project. He is prone to bombastic pronouncements about Minerva, making broad claims about the state of higher education that are at times insightful and at times speculative at best. He speaks at many conferences, unsettling academic administrators less radical than he is by blithely dismissing long-standing practices. "Your cash cow is the lecture, and the lecture is over," he told a gathering of deans. "The lecture model ... will be obliterated."

In academic circles, where overt competition between institutions is a serious breach of etiquette, Nelson is a bracing presence. (Imagine the president of Columbia telling the assembled presidents of other Ivy League schools, as Nelson sometimes tells his competitors, "Our goal is not to put you out of business; it is to lead you. It is to show you that there is a better way to do what you are doing, and for you to follow us.")

The other taboo Nelson ignores is acknowledgment of profit motive. "*For-profit* in higher education equates to evil," Nelson told me, noting that most for-profit colleges are indeed the sort of disreputable degree mills that wallpaper the Web with banner ads. "As if nonprofits aren't money-driven!" he howled. "They're just corporations that dodge their taxes." (See "The Law-School Scam.")

Minerva is built to make money, but Nelson insists that its motives will align with student interests. As evidence, Nelson points to the fact that the school will eschew all federal funding, to which he attributes much of the runaway cost of universities. The compliance cost of taking federal financial aid is about $1,000 per student—a tenth of Minerva's tuition—and the aid wouldn't be of any use to the majority of Minerva's students, who will likely come from overseas.

Subsidies, Nelson says, encourage universities to enroll even students who aren't likely to thrive, and to raise tuition, since federal money is pegged to costs. These effects pervade higher education, he says, but they have nothing to do with teaching students. He believes

Minerva would end up hungering after federal money, too, if it ever allowed itself to be tempted. Instead, like Ulysses, it will tie itself to the mast and work with private-sector funding only. “If you put a drug”—federal funds—“into a system, the system changes itself to fit the drug. If [Minerva] took money from the government, in 20 years we’d be majority American, with substantially higher tuition. And as much as you try to create barriers, if you don’t structure it to be mission-oriented, that’s the way it will evolve.”

Minerva CEO Ben Nelson’s first major hire was Stephen M. Kosslyn (right), a cognitive neuroscientist and former Harvard dean. (Ike Edeani)

When talking about Minerva’s future, Nelson says he thinks in terms of the life spans of universities—hundreds of years as opposed to the decades of typical corporate time horizons. Minerva’s very founding is a rare event. “We are now building an institution that has not been attempted in over 100 years, since the founding of Rice”—the last four-year liberal-arts-based research institution founded in this country. It opened in 1912 and now charges $53,966 a year.

So far, Minerva has hired its deans, who will teach all the courses for this inaugural class. It will hire rank-and-file faculty later in the year. One of Minerva’s main strategies is to lure a few prominent scholars from existing institutions. Other “new” universities, especially fantastically wealthy ones like King Abdullah University of Science and Technology, in Saudi Arabia, have attempted a similar strategy—at times with an almost cargocult-like confidence that filling their labs and offices with big-shot professors will turn the institutions themselves into important players.

Among the bigger shots hired by Minerva is Eric Bonabeau, the dean of computational sciences, who taught the seminar I participated in. Bonabeau, a physicist who has worked in academia and in business, studies the mathematics of swarming behavior (of bees, fish, robots), and his research helped inspire Michael Crichton’s terrible thriller *Prey*. Diane Halpern, a prominent psychologist, signed on this year as the dean of social sciences.

Minerva’s first major hire, Stephen M. Kosslyn, is a man I met in the fall of 1999, when I went to have my head examined. Kosslyn taught cognitive psychology and neuroscience for 32 years at Harvard, and during my undergraduate years I visited his lab and earned a few dollars here and there as one of his guinea pigs. The studies usually involved sticking my head in an fMRI machine so he and his researchers could record activity in my brain and observe which parts fired when.

Around that time, Kosslyn’s lab made news because it began to show how “mental imagery”—the experience of seeing things in your mind’s eye—really works. (One study involved putting volunteers into fMRI machines and asking them to hold an image of a cat in their head for as long as possible. You can try this exercise now. If you’re especially good at concentrating, the cat might vanish in a matter of a few seconds, as soon as your brain—distractible as a puppy—comes up with another object of attention.) Kosslyn served as Harvard’s dean of social sciences from 2008 to 2010, then spent two years at Stanford as the director of its Center for Advanced Study in the Behavioral

Sciences. In 2013, after a few months of contract work for Minerva, he resigned from Stanford and joined Minerva as its founding dean.

Kosslyn speaks softly and slowly, with little emotional affect. Bald and bearded, he has an owlish stare, and at times during my recent conversations with him, he seemed to be scanning my brain with his eyes. For purposes of illustration (and perhaps also amusement), he will ask you to perform some cognitive task, then wait patiently while you do it—explain a concept, say, or come up with an argument—before telling you matter-of-factly what your mind just did. When talking with him, you often feel as though your brain is a machine, and his job is to know how it works better than it knows itself.

He spent much of his first year at Minerva surveying the literature on education and the psychology of learning. "We have numerous sound, reproducible experiments that tell us how people learn, and what teachers can do to improve learning." Some of the studies are ancient, by the standards of scientific research—and yet their lessons are almost wholly ignored.

For example, he points to a 1972 study by Fergus I. M. Craik and Robert S. Lockhart in *The Journal of Verbal Learning and Verbal Behavior*, which shows that memory of material is enhanced by "deep" cognitive tasks. In an educational context, such tasks would include working with material, applying it, arguing about it (rote memorization is insufficient). The finding is hardly revolutionary, but applying it systematically in the classroom is. Similarly, research shows that having a pop quiz at the beginning of a class and (if the students are warned in advance) another one at a random moment later in the class greatly increases the durability of what is learned. Likewise, if you ask a student to explain a concept she has been studying, the very act of articulating it seems to lodge it in her memory. Forcing students to guess the answer to a problem, and to discuss their answers in small groups, seems to make them understand the problem better—even if they guess wrong.

Kosslyn had powers literally no one at Harvard—even the president—had. He could tell people what to do, and they had to do it.

Kosslyn has begun publishing his research on the science of learning. His most recent co-authored article, in *Psychological Science in the Public Interest*, argues (against conventional wisdom) that the traditional concept of "cognitive styles"—visual versus aural learners, those who learn by doing versus those who learn by studying—is muddled and wrong.

The pedagogical best practices Kosslyn has identified have been programmed into the Minerva platform so that they are easy for professors to apply. They are not only easy, in fact, but also compulsory, and professors will be trained intensively in how to use the platform.

This approach does have its efficiencies. In a normal class, a pop quiz might involve taking out paper and pencils, not to mention eye-rolls from students. On the Minerva platform, quizzes—often a single multiple-choice question—are over and done in a matter of seconds, with students' answers immediately logged and analyzed. Professors are able to sort students instantly, and by many metrics, for small-group work—perhaps pairing poets with business majors, to expose students who are weak in a particular class to the thought processes of their stronger peers. Some claim that education is an art and a science. Nelson has disputed this: "It's a science and a science."

Nelson likes to compare this approach to traditional seminars. He says he spoke to a prominent university president—he wouldn't say which one—early in the planning of Minerva, and he found the man's view of education, in a word, faith-based. "He said the reason elite university education was so great was because you take an expert in the subject, plus a bunch of smart kids, you put them in a room and apply pressure—and *magic* happens," Nelson told me, leaning portentously on that word. "That was his analysis. They're trying to sell magic! Something that happens by accident! It sure didn't happen when I was an undergrad."

To Kosslyn, building effective teaching techniques directly into the platform gives Minerva a huge advantage. "Typically, the way a professor learns to teach is completely haphazard," he says. "One day the person is a graduate student, and the next day, a professor standing up giving a lecture, with almost no training." Lectures, Kosslyn says, are pedagogically unsound, although for universities looking to trim budgets they are at least cost-effective, with one employee for dozens or hundreds of tuition-paying students. "A great way to teach," Kosslyn says drily, "but a terrible way to learn."

I asked him whether, at Harvard and Stanford, he attempted to apply any of the lessons of psychology in the classroom. He told me he could have alerted colleagues to best practices, but they most likely would have ignored them. "The classroom time is theirs, and it is sacrosanct," he says. The very thought that he might be able to impose his own order on it was laughable. Professors, especially tenured ones at places like Harvard, answer to nobody.

It occurred to me that Kosslyn was living the dream of every university administrator who has watched professors mulishly defy even the most reasonable directives. Kosslyn had powers literally no one at Harvard—even the president—had. He could tell people what to do, and they had to do it.

There were moments, during my various conversations with Kosslyn and Nelson, when I found I couldn't wait for Minerva's wrecking ball to demolish the ivory tower. The American college system is a frustrating thing—and I say this as someone who was a satisfied customer of two undergraduate institutions, Deep Springs College (an obscure but selective college in the high desert of California) and Harvard. At Deep Springs, my classes rarely exceeded five students. At Harvard, I went to many excellent lectures and took only one class with fewer than 10 students. I didn't sleepwalk or drink my way

through either school, and the education I received was well worth the $16,000 a year my parents paid, after scholarships.

But the Minerva seminar did bring back memories of many a pointless, formless discussion or lecture, and it began to seem obvious that if Harvard had approached teaching with a little more care, it could have improved the seminars and replaced the worst lectures with something else.

When Eric Bonabeau assigned the reading for his class on induction, he barely bothered to tell us what induction was, or how it related to North Atlantic cod. When I asked him afterward about his decision not to spend a session introducing the concept, he said the Web had plenty of tutorials about induction, and any Minerva student ought to be able to learn the basics on her own time, in her own way. Seminars are for advanced discussion. And, of course, he was right.

“The reason we can get away with the model we have is because MOOCs exist. The MOOCs will eventually make lectures obsolete.”

Minerva’s model, Nelson says, will flourish in part because it will exploit free online content, rather than trying to compete with it, as traditional universities do. A student who wants an introductory economics course can turn to Coursera or Khan Academy. “We are a university, and a MOOC is a version of publishing,” Nelson explains. “The reason we can get away with the pedagogical model we have is because MOOCs exist. The MOOCs will eventually make lectures obsolete.”

Indeed, the more I looked into Minerva and its operations, the more I started to think that certain functions of universities have simply become less relevant as information has become more ubiquitous. Just as learning to read in Latin was essential before books became widely available in other languages, gathering students in places where they could attend lectures in person was once a necessary part of higher education. But by now books are abundant, and so are serviceable online lectures by knowledgeable experts.

On the other hand, no one yet knows whether reducing a university to a smooth-running pedagogical machine will continue to allow scholarship to thrive—or whether it will simply put universities out of business, replace scholar-teachers with just teachers, and retard a whole generation of research. At any great university, there are faculty who are terrible at teaching but whose work drives their field forward with greater momentum than the research of their classroom-competent colleagues. Will there be a place for such people at Minerva—or anywhere, if Minerva succeeds?

Last spring, when universities began mailing out acceptance letters and parents all over the country shuddered as the reality of tuition bills became more concrete, Minerva sent 69 offers. Thirty-three students decided to enroll, a typical percentage for a liberal-arts school. Nelson told me Minerva would admit students without regard for diversity or balance of gender.

Applicants to Minerva take a battery of online quizzes, including spatial-reasoning tests of the sort one might find on an IQ test. SATs are not considered, because affluent students can boost their scores by hiring tutors. ("They're a good way of determining how rich a student is," Nelson says.) If students perform well enough, Minerva interviews them over Skype and makes them write a short essay during the interview, to ensure that they aren't paying a ghost writer. "The top 30 applicants get in," he told me back in February, slicing his hand through the air to mark the cutoff point. For more than three years, he had been proselytizing worldwide, speaking to highschool students in California and Qatar and Brazil. In May, he and the Minerva deans made the final chop.

Of the students who enrolled, slightly less than 20 percent are American*—a percentage much higher than anticipated. (Nelson ultimately expects as many as 90 percent of the students to come from overseas.) Perhaps not surprisingly, the students come disproportionately from unconventional backgrounds— nearly one-tenth are from United World Colleges, the chain of cosmopolitan hippie high schools that brings together students from around the globe in places like Wales, Singapore, and New Mexico.

In an oddly controlling move for a university, Minerva asked admitted students to run requests for media interviews by its public-relations department. But the university gave me the names of three students willing to speak.

"That's what Minerva is offering: an experience that lets you live multiple lives and learn not just your concentration but how to think."

When I got through to Ian Van Buskirk of Marietta, Georgia, he was eager to tell me about a dugout canoe that he had recently carved out of a two-ton oak log, using only an ax, an adze, and a chisel, and that he planned to take on a maiden voyage in the hour after our conversation. He told me he would have attended Duke University if Minerva hadn't come calling, but he said it wasn't a particularly difficult decision, even though Minerva lacks the prestige and 176-year history of Duke. "There's no reputation out there," he told me. "But that means we get to make the reputation ourselves. I'm creating it now, while I'm talking to you."

Minerva had let him try out the same online platform I did, and Van Buskirk singled out the "level of interaction and intensity" as a reason for attending. "It took deep concentration," he said. "It's not some lecture class where you can just click 'record' on your tape." He said the focus required was similar to the mind-set he'd needed when he made his first hacks into his oak log, which could have cracked, rendering it useless.

Another student, Shane Dabor, of the small city of Brantford, Ontario, had planned to attend Canada's University of Waterloo or the University of Toronto. But his experiences with online learning and a series of internships had led him to conclude that traditional universities were not for him. "I already had lots of friends at university who weren't learning anything," he says. "Both options seemed like a wager, and I chose this one."

A young Palestinian woman, Rana Abu Diab, of Silwan, in East Jerusalem, described how she had learned English through movies and books (a translation of the Norwegian philosophical novel *Sophie's World* was a particular favorite). "If I had relied on my school, I would not be able to have a two-minute conversation," she told me in fluent English. During a year studying media at Birzeit University, in Ramallah, she heard about Minerva and decided to scrap her other academic plans and focus on applying there. For her, the ability to study overseas on multiple continents, and get an American-style liberalarts education in the process, was irresistible. "I want to explore everything and learn everything," she says. "And that's what Minerva is offering: an experience that lets you live multiple lives and learn not just your concentration but how to think." Minerva admitted her, and, like a third of her classmates in the founding class, she received a supplemental scholarship, which she could use to pay for her computer and health insurance.

Two students told me that they had felt a little trepidation, and a need to convince themselves or their parents that Minerva wasn't just a moneymaking scheme. Minerva had an open house weekend for admitted students, and (perhaps ironically) the in-person interactions with Minerva faculty and staff helped assure them that the university was legit. The students all now say they're confident in Minerva—although of course they can leave whenever they like, with little lost but time.

Some people consider universities sacred places, and they might even see professors' freedom to be the fallible sovereigns of their own classrooms as a necessary part of what makes a university special. To these romantics, universities are havens from a world dominated by orthodoxy, money, and quotidian concerns. Professors get to think independently, and students come away molded by the total experience—classes, social life, extracurriculars—that the university provides. We spend the rest of our lives chasing mates, money, and jobs, but at university we enjoy the liberty to indulge aimless curiosity in subjects we know nothing about, for purposes unrelated to efficiency or practicality.

Minerva is too young to have attracted zealous naysayers, but it's safe to assume that the people with this disposition toward the university experience are least likely to be enthusiastic about Minerva and other attempts to revolutionize education through technical innovation. MOOCs are beloved by those too poor for a traditional university, as well as those who like to dabble, and those who like to learn in their pajamas. And MOOCs are not to be knocked: for a precocious Malawian peasant girl who learns math through free lessons from Khan Academy, the new Web resources can change her life. But the dropout rate for online classes is about 95 percent, and they skew strongly toward quantitative disciplines, particularly computer science, and toward privileged male students. As Nelson is fond of pointing out, however, MOOCs will continue to get better, until eventually no one will pay Duke or Johns Hopkins for the possibility of a good lecture, when Coursera offers a reliably great one, with hundreds of thousands of five-star ratings, for free.

“Plutarch said the mind is not a vessel to be filled but a fire to be lit. Part of my worry about these Internet start-ups is that it’s not clear they’ll be any good at the fire-lighting part.”

The question remains as to whether Minerva can provide what traditional universities offer now. Kosslyn’s project of efficiently cramming learning into students’ brains is preferable to failing to cram in anything at all. And it is designed to convey not just information, as most MOOCs seem to, but whole mental tool kits that help students become morethoughtful citizens. But defenders of the traditional university see efficiency as a false idol.

“Like other things that are going on now in higher ed, Minerva brings us back to first principles,” says Harry R. Lewis, a computer-science professor who was the dean of Harvard’s undergraduate college from 1995 to 2003. What, he asks, does it mean to be educated? Perhaps the process of education is a profound one, involving all sorts of leaps in maturity that do not show up on a Kosslyn-style test of pedagogical efficiency. “I’m sure there’s a market for people who want to be more efficiently educated,” Lewis says. “But how do you improve the efficiency of growing up?”

He warns that online-education innovations tend to be oversold. “They seem to want to re-create the School of Athens in every little hamlet on the prairie—and maybe they’ll do that,” he told me. “But part of the process of education happens not just through good pedagogy but by having students in places where they see the scholars working and plying their trades.”

He calls the “hydraulic metaphor” of education—the idea that the main task of education is to increase the flow of knowledge into the student—an “old fallacy.” As Lewis explains, “Plutarch said the mind is not a vessel to be filled but a fire to be lit. Part of my worry about these Internet start-ups is that it’s not clear they’ll be any good at the fire-lighting part.”

In February, at a university-administrator conference at a Hyatt in downtown San Francisco, Ben Nelson spoke to a plenary session of business-school deans from around the world. Daphne Koller of Coursera sat opposite him onstage, and they calmly but assuredly described what sounded to me like the destruction of the very schools where their audience members worked. Nelson wore a bored smirk while an introductory video played, advertising the next year’s version of the same conference. To a pair of educational entrepreneurs boasting the low price of their new projects, the slickly produced video must have looked like just another expensive barnacle on the hull of higher education.

“Content is about to become free and ubiquitous,” Koller said, an especially worrying comment for deans who still thought the job of their universities was to teach “content.” The institutions “that are going to survive are the ones that reimagine themselves in this new world.”

Even if Minerva turns out not to be the venture that upends American higher education, other innovators will crop up in its wake.

Nelson ticked off the advantages he had over legacy institutions: the spryness of a well-funded start-up, a student body from all over the world, and deals for faculty (they get to keep their own intellectual property, rather than having to hand over lucrative patents to, say, Stanford) that are likely to make Minerva attractive.

Yet in some ways, the worst possible outcome would be for U.S. higher education to accept Minerva as its model and dismantle the old universities before anyone can really be sure that it offers a satisfactory replacement. During my conversations with the three Minerva students, I wanted to ask whether they were confident Minerva would give them all the wonderful intangibles and productive diversions that Harry Lewis found so important. But then I remembered what I was like as a teenager headed off to college, so ignorant of what college was and what it could be, and so reliant on the college itself to provide what I'd need in order to get a good education. These three young students were more resourceful than I was, and probably more deliberate in their choice of college. But they were newcomers to higher education, and asking them whether their fledgling alma mater could provide these things seemed akin to asking the passengers on the *Mayflower* how they liked America as soon as their feet touched Plymouth Rock.

Lewis is certainly right when he says that Minerva challenges the field to return to first principles. But of course the conclusions one reaches might not be flattering to traditional colleges. One possibility is that Minerva will fail because a college degree, for all the high-minded talk of liberal education— of lighting fires and raising thoughtful citizens— is really just a credential, or an entry point to an old-boys network that gets you your first job and your first lunch with the machers at your alumni club. Minerva has no alumni club, and if it fails for this reason, it will look naive and idealistic, a bet on the inherent value of education in a world where cynicism gets better odds.

In another sense, it's difficult to imagine Minerva failing altogether: it will offer something that resembles a liberal education to large segments of the Earth's population who currently have to choose between the long-shot possibility of getting into a traditional U.S. school, and the more narrowly career-oriented education available in their home country. That population might give Minerva a steady flow of tuition-paying warm bodies even if U.S. higher education ignores it completely. It could plausibly become the Amherst of the world beyond the borders of the United States.

These are not, however, the terms by which Ben Nelson defines success. To him, the brass ring is for Minerva to force itself on the consciousness of the Yales and Swarthmores and "lead" American universities into a new era. More modestly, we can expect Minerva to force some universities to justify what previously could be waved off with mentions of "magic" and a puff of smoke. Its seminar platform will challenge professors to stop thinking they're using technology just because they lecture with PowerPoint.

It seems only remotely possible that in 20 years Minerva could have more students enrolled than Ohio State will. But it is almost a certainty that the classrooms of elite universities will in that time have come to look more and more like Minerva classrooms, with professors and students increasingly separated geographically, mediated through technology that alters the nature of the student-teacher relationship. Even if Minerva turns out not to be the venture that upends American higher education, other innovators will crop up in its wake to address the exact weaknesses Nelson now attacks. The idea that college will in two decades look exactly as it does today increasingly sounds like the forlorn, fingers-crossed hope of a higher-education dinosaur that retirement comes before extinction.

At the university-administrator conference where Nelson spoke in February, I sat at a table with an affable bunch of deans from Australia and the United States. They listened attentively, first with interest and then with growing alarm. Toward the end of the conversation, the sponsoring organization's president asked the panelists what they expected to be said at a similar event in 2017, on the same topic of innovative online education. ("Assuming we're still in business," a dean near me whispered to no one in particular.)

Daphne Koller said she expected Coursera to have grown in offerings into a university the size of a large state school—after having started from scratch in 2012. Even before Nelson gave his answer, I noticed some audience members uncomfortably shifting their weight. The stench of fear made him bold.

"I predict that in three years, four or five or seven or eight of you will be onstage here, presenting your preliminary findings of your first year of a radical new conception of your undergraduate [or] graduate program ... And the rest of you will look at two or three of those versions and say, 'Uh-oh.' " This was meant as a joke, but hardly anyone laughed.

Note: The online version has been changed to reflect additional information about the composition of Minerva's inaugural class, provided by Minerva after the magazine went to press.

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