



THE NATURE OF THE FUTURE

DISPATCHES FROM
THE **SOCIALSTRUCTURED WORLD**

MARINA GORBIS

The Whole World's a Classroom

If you want to build a ship, don't gather people together to collect wood and don't assign them tasks and work, but rather, teach them to long for the endless immensity of the sea.

ANTOINE DE SAINT-EXUPÉRY

Future Scenario 2021: Free-Range Architecture

With a heavy heart, Andy Rhimes decided to take a year off from his architecture program in college—and he wasn't sure if he would ever go back. He had dreamed of becoming an architect since he was sixteen, when he attended a lecture by Frank Gehry, a pioneer of poststructuralist architecture. The ideas Gehry talked about—especially that form need not follow function—and the beautiful, challenging, and weird building designs he showed to illustrate his point captured Andy's imagination. The concept that city buildings could be a form of artistic, even philosophical expression ignited in him a burning desire to become an architect. He started collecting pictures of buildings he found interesting and proceeded to devour books on architecture. He discovered Gaudí, Koolhaas, I. M. Pei, Saarinen, and many other pioneering architects and their creations. Ecological design particularly interested him, and he aspired to build affordable and ecologically sustainable housing.

Getting accepted into one of the top architecture schools in the country was a dream come true. The summer before classes started, Andy imagined himself working on cool projects with fellow students and having deep conversations with his professors about the nature of architecture and the role of the architect in society.

But seven months into his college experience, after numerous nights staying up to finish a project that didn't seem relevant or interesting, and numerous mornings

struggling to stay awake in class, he took stock of the situation. Yes, he had met a few great professors and some interesting students. And he enjoyed weekends spent drinking with his dorm mates (a requirement if one wanted to be part of campus social life). He had learned some new things, but the joy of discovering architecture was somehow gone. His days were filled with too many tasks that didn't seem to be getting him where he wanted to be. In the rush to please his teachers, get good grades, and have a social life, studying had become less about learning and more about doing stuff for others. Andy hadn't read a book for pleasure in months. He wistfully remembered those free hours when he could just read or tinker in his workshop and think. "That's it!" he realized. That was the hardest thing for him to accept: he didn't have time to think! And thinking was what he desperately wanted to do.

Eventually he made the painful phone call he had been dreading for months. He told his parents that he needed to take a year off to figure things out. "I am dedicated to architecture. I am very self-directed," he said, fighting back tears. "But this is just not working for me. All I feel is stressed out and overwhelmed all the time. I just don't want to live like that anymore." They struck a deal: Andy would take a year off and work, then either transfer to a different college or figure out an alternative way to become an architect.

Over the summer Andy got a job at Burger Barn. He was reading lots of books and had regained some control over his time, which afforded him opportunity to think. One thing he realized he desperately needed and wanted was a mentor, someone to guide him in his studies and to tell him what was important to know. He wanted someone to point him to the right resources and interesting people and to discuss ideas with him. He also wanted to find peers who shared his passion so they could learn from each other. So he turned to social media and asked his community if anyone could help him in his quest. A friend recommended Socrates 2.0, a new platform that connected people with mentors in different fields.

At the time the platform was in beta but aimed to recruit thousands of mentors, former and current college professors and working professionals, to guide groups of mentees in their desired fields. The mentors would not only help students design courses of study individually tailored to meet their interests and learning styles but

would also help them find learning resources wherever they might be: the Internet, community colleges, museums, meet-ups, and other places. Socrates 2.0 also provided lots of relevant resources and metrics for measuring learning progress. All Andy had to do was type in his zip code and area of interest, and profiles of potential mentors with reviews and backgrounds showed up.

There were five potential mentors Andy could choose from in his geographic area. He arranged meetings with each one, for the two to get to know each other and see if there was a fit. Socrates 2.0 provided suggestions for the kinds of questions the two might ask, and Andy found they really helped with the conversation.

Among the mentors Andy interviewed, Tom stood out. When Andy contacted him, Tom suggested that they have a “walking meeting.” He’d take Andy around Santa Monica on foot and they would talk while looking at different buildings. This turned into a combination walking lecture and conversation, with Tom pointing out interesting architectural elements and at the same time engaging Andy in a conversation about his background, interests, and dreams. Andy was amazed at Tom’s range of experiences and knowledge; Tom was teaching urban design theory a few hours a week at a prestigious architecture school but also had practical experience, having participated in strategic planning and inner-city revitalization projects. He was also involved in building villages in Panama and Senegal, and he had received various prestigious awards and published articles and books. They talked about the global water crisis, and Tom told Andy about the qanats (indigenous water systems) of Yazd, Iran, and the sacred water tanks of Varanasi, India.

Andy knew right then and there that he wanted Tom to be his mentor. He felt the excitement of learning coming back to him, something he had feared his first year of college had quashed forever. He applied to be in Tom’s mentee group and was accepted along with four others. The five, who informally called themselves Tom’s Squad, became the core of Andy’s peer learning community. Three were college-age students, one a retired doctor who had always been interested in architecture, and one a midcareer professional who wanted to transition into architecture. Each paid \$8,000 a year to be in the mentorship program. Socrates 2.0 kept 5 percent of this amount, and the rest went directly to the mentor.

After starting Socrates 2.0, Andy quit working at Burger Barn. He convinced his

parents to pay for Socrates 2.0 in lieu of his college tuition, and they thought it was a good deal, although they did worry about the legitimacy of it. Now Andy's typical day starts with checking into Socrates 2.0, which keeps track of his learning progress: the levels of knowledge he has acquired, the books and articles he has read, and his contributions to various projects. Tom tracks Andy's progress on the site and often connects with him via video chat to give him suggestions or just to check in. He wants to make sure that Andy can get his architecture certificate in four years. (Luckily the new accreditation process grants accreditation to individuals rather than architecture schools.) The other day, for example, he told Andy to learn more about structural integrity. In addition to online check-ins, the mentee group gets together with Tom weekly for tutoring, to have conversations, and to work together on projects.

Andy and his peers also organize frequent architecture meet-ups that bring together students, professionals, and amateurs interested in architecture. These serve as learning spaces, places to meet other people, exchange ideas, and hear interesting people speak. In one of the meet-ups, Andy learned about the use of biomimicry in architecture. Leslie, who had been involved in the back-to-the-land movement and had lived in a yurt in her youth, told him about a building in Zimbabwe that was modeled on a termite mound, thus providing a natural way to air-condition the structure. She explained to Andy that Mother Nature is quite an architect and her works are a great source of learning. "Have you ever butchered an animal?" she asked. "Cut muscle tissue, sawed through the bone? You know, once you get through the fat and muscle, there's that sinewy stuff? The way that muscles and cartilage provide continuous pull and the bones discontinuous push? That's architecture! That's the best way to build a bridge!"

It really got him thinking.

Museums and distinctive buildings are other resources Andy uses for learning. With an app called ArchGenius, he can point his augmented reality phone at any architecturally significant building and the phone will display information on the building's history and architectural details, sometimes even providing architectural drawings for the place. All of this information has been crowdsourced, that is, contributed and aggregated by others supplying links and annotations. Andy is not

only the user of the app but also a contributor, since the app alerts him to “contribution opportunities,” opportunities to add missing information such as blueprints, info on the architect’s design intent, and site history. This way he accumulates currency on the platform that counts toward his architecture certification. These points are also tracked on Socrates 2.0.

Recently Andy was asked to come back to his high school as part of an alumni panel to share college experiences. He talked about Socrates 2.0 and how he is going about learning and pursuing his dream of becoming an architect. When the moderator asked him, “Would you recommend it to others?,” he had to think hard. It was definitely working for him, but he was never cut out for institutional learning; it just deadened his desire to learn. “You have to be pretty self-motivated, self-directed, and organized for this to work” was his reply. “Socrates 2.0 is not for everyone. But if you can take on the burden of putting together all the necessary resources and making sure that you follow your path, it is the best learning I can think of.”

The Trouble with Old School

Quick confession: while this scenario is based on an analysis of shifts that are beginning to reshape our education system, it is also a reflection of my own hopes for the future and a reaction to years of personal experience with the American education system. These experiences started in the mid-1990s when my son, Greg, entered Peninsula School, one of the last progressive schools in the San Francisco Bay Area. The school was founded in 1925 by Josephine Duveneck, an educator and environmentalist, and follows many principles of experiential learning pioneered by John Dewey, the early twentieth-century American educational reformer.

Defying decades of external pressures and changing mandates by state and federal regulators, Peninsula does not assign grades, its teachers give very little homework (and then only in the upper grades), and the school eschews participation in most organized athletics (although kids get plenty of game and exercise time outdoors). At Peninsula, students spend lots of time in unstructured play, social interactions, and reflection. Arts, shop, music, ceramics, and weaving are integrated into the

curriculum along with academic disciplines. In the afternoon, kids can choose among different activities, thus experiencing firsthand self-directed learning. This allows those who are into science to spend all of their free time in the science room, those who are into music to play music for hours each day, and those who are into art or weaving or woodshop to engage in those activities to their heart's delight. Greg spent all his free time in the music room and is pursuing a music career today. Our neighbor Matt spent most of his free time in the science room, then went on to study at Cornell and is now getting his PhD in engineering at Stanford while working at NASA.

Instead of receiving report cards, parents are invited to meet with the teacher twice a year, mainly to talk about the child: how he or she is doing socially, emotionally, and physically, what he or she likes and dislikes. The teacher has a deep insight into the student and a deep connection with everything that goes on in the classroom. Academic performance is a minor part of such conversations. The assessment is about the child as a person.

Peninsula's radical departure from mainstream educational practices made my son's years there a real experiment for my husband and me, two overeducated adults schooled in the old system. For a lot of our time at Peninsula, we were nagged by doubt: yes, Peninsula is a great environment for kids; yes, Greg is turning out to be a creative, caring, thoughtful human being. But is he getting enough academics? Is he getting enough of the basics in math, writing, and science? Several times we seriously thought about taking him out of Peninsula and enrolling him in another, more academic school. Usually this happened after a conversation with a parent whose child was doing algebra in the third grade or writing ten-page essays in the fifth.

The experiment ended with Greg entering a highly regarded college prep high school because Peninsula ends after eighth grade. All three of us held our breath. Would he be able to function in an intense academic environment? Would he be able to adjust? Would he know how to take tests? Would he feel hopelessly behind his peers in math and science? When we came up for air after the first few months of adjusting to a new routine—new commute, new relationships, and everything else that goes along with the transition to high school—we realized that the magic of

Peninsula School had worked for Greg. Like all those other Peninsula kids I was hearing from at yearly graduate forums, Greg was doing just fine compared to kids from “academically challenging” schools. The greatest adjustment was to be getting grades at all.

But a shift occurred sometime after his first year of high school and became fully apparent by the end of his high school career: during the four years of being in a highly academic environment, instead of becoming inspired to learn, Greg, year by year, had become turned off from learning and more and more cynical about teachers, the school’s administration, and the whole education system. Learning had gone from being a joyful, often invisible part of the fabric of his daily life to being a chore, something he did because someone else was forcing him to, something he would be judged on and for which he would be either rewarded or punished. Upon graduating from Peninsula, Greg had said, “There wasn’t a day I didn’t look forward to going to school.” Toward the end of his high school career, he told his advisor, “I hate school. Every morning when I wake up, I hate the thought of going to school.” A sad transformation in less than four years!

To Greg education became a series of hoops you jump through: do this and you will get that. In other words, he adjusted well. This is exactly how most of his friends felt about school; in fact they couldn’t fathom that there could be another system, a different way of learning. I’ve spent hours talking to students about the experience of institutionalized education killing the desire to learn. Too many have told me, “I used to love to read, but I don’t read for pleasure anymore. I have too much assigned reading at school.” These sentiments were echoed by the two hundred students in Michael Wesch’s anthropology class at Kansas State University when he asked them to collaboratively create and then deliver a message online about their educational experiences. Here are some of the things they said:

Only 18 percent of my teachers know my name.

I am defined by numbers.

I complete 49 percent of the readings assigned to me. Only 26 percent seem relevant to my life.¹

As we have done in other areas of our economy and society, we have created an education system optimized for massive scale, providing the same educational resources in essentially the same settings to masses of people whose educational attainment is measured and judged by narrow but universally applied metrics that have little to do with true mastery of content, long-term retention, or critical thinking. In this system, we measure achievement with scored tests such as the SAT, the GRE, the LSAT, the STAR, and countless others. The tests are rigorous but one-dimensional; the only creative thing about them is their acronyms. They may serve bureaucratic exigencies because they allow institutions to quickly sort people for acceptance or promotion to the next academic level, but they are poor reflections of individuals' abilities and capacity for long-term success.

This old system is slowly being dismantled, and not just by new technology and social platforms. Lack of government funding is pushing the quality of public education down and costs up. In fact, young people today are caught in the transition between these two worlds—the world of institutional production and the new world of learning that is coming to resemble Andy's. This world is characterized by four key elements, illustrated in Andy's scenario: easy, individualized, and highly contextual learning experiences; ubiquitous free content; community as a driver and enabler of learning; intrinsic rewards and meaningful learning currencies.

These forces are undermining the dominance of institutional education and are gaining traction today.

Microlearning: Easy, Individualized, and Highly Contextual

This probably sounds familiar: you are with a group of friends arguing about some piece of trivia or historical fact. Someone says, "Wait, let me look this up on Wikipedia," and proceeds to read the information out loud to the whole group, thus resolving the argument. Such an event is a genuine educational moment, or more precisely, a *microeducational* moment. Everyone is motivated to learn something at that particular moment; they are curious, they want the information, so they go ahead and get it in a quick, easy, and social way.

As I outlined in [Chapter 1](#), one of the key characteristics of social structuring is microcontributions by large numbers of people. Microcontributions make difficult tasks virtually effortless as contributors work in bursts of inspired activity rather than an 8-to-5 shift under conditions mandated by employers or external demands. This doesn't necessarily mean working less; it means doing work on our own terms instead of someone else's. The equivalent of that in education is microlearning: learning that is effortless and done in context, when the person really wants or needs to learn. It is learning driven not by bureaucratic imperatives but by individual desires and needs.

Microlearning goes hand in hand with the notion of flow as described by Mihaly Csikszentmihalyi, a psychologist and an expert on creativity. He defined flow as “the state in which people are so involved in an activity that nothing else seems to matter; the experience itself is so enjoyable that people will do it even at a great cost, for the sheer sake of doing it.”² We've all experienced such moments, and we've probably seen kids immersed in this state for extended periods of time. When a kid is in a flow state, she can spend hours doing something with complete abandon: studying books on dinosaurs, memorizing all their names and the fine distinctions among them. The same activity may be impossibly difficult if it is assigned when she really wants to play music. You can spend hours forcing a child to memorize the names, or she can do it on her own in a few minutes if she is interested. We all know this feeling of being totally involved in an activity so that whatever we are doing feels effortless. We long for such moments, whether we are engaged in writing, woodworking, reading, or running.

Most institutional settings, particularly educational ones, with their highly structured lesson times and sequences, go against the concept of flow. Kids who are interested in something are rarely allowed to spend as much time on the activity as they want to; they are often forced to spend time engaging in activities that don't interest them at all. This is one reason many schools place so much emphasis on discipline; discipline issues are often a direct result of boredom. When kids are truly engaged in something, they don't have time to be disruptive.

The more structured the school day is, the less free time students have, the less chance they have to achieve flow states and learn at their own pace. Instead of

making learning easy for them, allowing them to pick up what they are passionate about at a particular time, we cram what *we* think is appropriate into *our* time schedule, not theirs.

For instance, most school schedules work directly against students' biological clock, their circadian rhythm. Research shows that the body clock of teenagers is naturally set to a schedule different from that of younger children or adults. This keeps adolescents from tiring until around 11 P.M., when they produce the sleep-inducing hormone melatonin, and it keeps them from waking up much before 8 A.M., which is when their body stops producing melatonin. Most high schools, however, require adolescents to wake up much earlier. The result is that the first class of the morning is often wasted, with over a quarter of students falling asleep in class once a week, according to a National Sleep Foundation poll.³ Many of our adolescents therefore live in a state of permanent desynchronosis, which most of us know as jet lag, being out of sync with one's biological clock. Adjusting school start times just slightly could improve learning outcomes substantially. As the *New York Times* reported, when "high schools in Jessamine County, Kentucky, pushed back the first bell to 8:40 A.M. from 7:30 A.M.," attendance immediately went up, "as did scores on standardized tests, which have continued to rise each year."⁴ Similar results have been achieved in school districts in Virginia and Connecticut. When several high schools in Minnesota moved start times closer to 9 A.M., "students' grades rose slightly and lateness, behavioral problems, and dropout rates decreased."⁵

This is one reason why Andy Rhimes' day using Socrates 2.0 feels easier. He may actually spend more time learning than he would in the classroom setting, but a lot of this learning occurs in context, in the real world, in places that are conducive to learning. Further, the learning happens according to his interests and needs, on terms that work for him. Online resources make it increasingly possible for people to create personalized learning, allowing them to learn at times and in contexts that are meaningful and convenient to them rather than to educational institutions.

The Whole World's a Classroom: Ubiquitous Free Content

Along with technologies and platforms that facilitate microlearning comes the democratization of content. As discussed earlier, a mass of information that was once the purview of a few credentialed teachers or locked in textbooks is being put online, for free. Take, for instance, the Khan Academy, the not-for-profit educational organization created in 2006 by Salman Khan, a former hedge fund analyst. With the mission of “providing a high-quality education to anyone, anywhere,”⁶ the Khan Academy supplies free online microlectures in video tutorials stored on YouTube. Tutorials encompass subjects as diverse as mathematics, history, finance, physics, chemistry, biology, astronomy, and economics and are viewed by some two million users a month.⁷

Two years ago, a high school intern we hired at the Institute for the Future took it upon himself to watch all of the nearly seven hundred TED Talks videos available online at that time. The videos feature concise, provocative presentations delivered by leading thinkers in technology, entertainment, and design (TED). These categories are defined broadly so as to represent the best and the brightest from a wide array of fields, picked not only for their content but also for their ability to inspire. I would daresay the TED lectures beat 90 percent of lectures delivered in an average classroom in terms of quality, provocativeness, content, and entertainment value. So a summer spent immersed in TED lectures is not a bad learning experience! And today they are all available for free to anyone with a computer or a smartphone. With more and more courses and educational content becoming available online, Bill Gates predicted in 2010 that “five years from now on the web for free you’ll be able to find the best lectures in the world. . . . It will be better than any single university.”⁸

We are also able to query people with a broad range of expertise around the world to help us learn in real time. Platforms such as Fluther or Quora allow anyone to post a question for the community to answer. Posts vary from relatively trivial relationship questions like “How many days of silence mean that it is over?” to complex math questions. Dan Finkel, one of the founders of Fluther, asked for help in solving an algebraic question that came up in his work on the platform. He was pretty skeptical that anyone would be able to offer a solution, but to his surprise, twenty-seven comments later a fellow Flutherer who went by the name

BonusQuestion did provide a solution and a proof. Here is an excerpt from their online exchange:

Finkelitis: You're totally right, BonusQuestion. And you've incidentally answered another question that was on my mind (about the $d=0$ case). Thanks for the insight!

BonusQuestion: You're welcome. Glad it helped. For those who are interested in the solution of Pell's equation, there is a rather elementary method for finding those solutions. For details check this pdf out.⁹

Not only do we have access to question-and-answer platforms that help us learn; increasingly we also have access to world-class experts who can provide personalized advice and mentorship. Expert Insight, founded by Brandon Adams, a PhD graduate of Harvard Business School, allows people to gain access to experts in multiple disciplines. Experts list their rates and availability, and those interested can select an hour or two from their chosen expert's schedule and pay online. They then receive the expert's proprietary email address for correspondence before the appointment. When the time comes, they log onto a Skype-type video chat system and ask away for the purchased hour. Some of the experts are academics who also teach in colleges and universities, including Jeffrey Miron, a senior lecturer and the director of undergraduate studies in the Department of Economics at Harvard University. For \$4,000 you can even buy an hour with Gary Becker, a Nobel Prize-winning economist from the University of Chicago! Not everyone can afford to pay the price, but the same platform can be used for people to offer advice for free or at very low prices.

John Falk, who leads a project on free-choice science at Oregon State University, points out that we “spend less than 5 percent of our lives in classrooms, and an ever-growing body of evidence demonstrates that most science is learned outside of school.”¹⁰ The same is true for most other disciplines. For many subjects, in fact, the traditional classroom may be the least conducive environment for learning. The classroom is a sensory-poor place; it cannot compare to the vibrancy, colors, smells, and interactions of the world outside it. And when you are able to point your

smartphone at what you are interested in and get the information you need or the answers to your questions, the world becomes an amazingly rich classroom.

We are living in an age in which technologies from smartphones to augmented reality and platforms such as Fluther and Expert Insight, combined with rich online content, make information increasingly cheap and widely available anytime and anywhere. The movement of information into the real world from restricted physical settings—classrooms and desktops—will greatly increase opportunities for learning. It will indeed become possible to embed learning into everyday experiences. We will be able to tap into this richness of information while walking, riding a bus, or sitting at home or in a park. The whole world can truly be a classroom and every moment can be a learning moment.

At Peninsula School, kids spend relatively little time receiving formal classroom instruction, but they learn just as much as or more than kids in conventional schools. This is because learning happens not just in the classroom in forty-five-minute chunks but anytime, anywhere: during school activities, at break time, and after school when kids are just hanging out together. At one graduates forum, where alums were asked to relate their experiences of transitioning into traditional high schools, a sophomore at an exclusive private school related how surprised she was to find out that at her new school “learning was something you did in the classroom,” that kids didn’t continue conversations started in the classroom when they went outside. Such separations do not exist at Peninsula. Barbie, the weaving teacher at Peninsula, once told me about a child asking her while weaving, “What is DNA?” Barbie’s response was, “Do you want a ten-minute answer or a deeper one?” The question led to an impromptu discussion of the structure of DNA among about ten kids ranging in age from ten to fourteen. The same thing happens in woodshop, where, unbeknownst to them, kids are introduced to the basics of geometry while doing cool building projects.

While on the surface it appears that the Peninsula students are spending less time in academic instruction, in reality their days are filled with learning—learning that is meaningful to them and occurs on their terms. Conversations in the classroom about the Civil War continue in the gazebo at lunch or during activities, and because kids are not exhausted by, but are enthused about school, they bring those conversations

home with them. With the new technology infrastructure, the experience of embedded, embodied, and highly contextual learning can indeed become pervasive, not just something one or a few unique schools practice, but something all of us can be a part of.

Socially Embedded Learning: Community as a Driver and Enabler of Learning

While easy access to unprecedented amounts of information is tremendously important, it is only one part of the education equation. Learning is social. This is something many schools have forgotten or decided to organize against, yet it is one of the key reasons Peninsula School excels at fostering learning. Peninsula's success rests on relationships. When you visit the school, you find small groups of teachers, students, and staff in the library, in the music room, in the gazebo eating lunch, in the classroom, or out on the Big Field playing games. Teachers and staff are students' friends, mentors, role models, and co-discoverers. They are teachers in the best Socratic tradition. Everything at the school is highly personalized and relationship-based. This is evident even in the names of the classes: there are no first, second, or third grades; instead there is Josie's class, Gail's, and Rebecca's. Each class has a strong imprint of the teacher who leads it. At Peninsula, relationships—among teachers and students, among teachers who work together collaboratively, among parents, teachers, and staff—are at the core of everything. When graduates are asked “What do you value most about Peninsula?” one consistent answer is “Relationships.” In his high school application, Greg wrote, “At Peninsula many of the teachers were my friends.”

Relationships are important because they are a key driver of learning. Many proponents of distance learning miss the importance of relationships and social connections in education. I believe online learning and resources alone will not provide a solution to our educational needs. One needs mentors, someone to look up to and to guide the learning process, to help filter what one needs to know and to provide feedback. One also needs a community to discuss ideas with, to foster the desire to learn, and to receive recognition from. Once you have the inspiration, the

mentorship, and the community, you can take advantage of the rich ecology of content described in the previous section.

This is exactly what the Socrates 2.0 scenario emphasizes. Andy has access to a mentor, and he is embedded in multiple communities that foster his learning, most of them outside of the traditional classroom setting. The meet-ups that he attends are learning communities; for example, he learns about biomimicry from Leslie, a participant who is quite a bit older and has a lot of experience. This is what is happening today in many meet-ups and hackathons organized around the country.

After all, learning is about participating in a conversation, and kids (and adults) want to participate in conversations with those who matter to them. If the conversation in their circle is about math or physics or Chaucer, they want to know enough to participate. It is amazing to what lengths we will go to acquire knowledge that can make us shine in our social circle or in front of people who matter to us. In too many classroom settings, the focus on academics misses this social aspect of learning. In fact, most of the time it is seen as a distraction or an impediment.

Eri Gentry, the founder of BioCurious, got excited about biology because she had friends who were doing fascinating research in the field. She decided she wanted to be part of a community that makes science accessible to the general public. BioCurious is a learning community of participants ranging from academics doing advanced biology research at universities to teenagers trying out basic but quirky experiments. Although Eri herself does not have formal training in biology, she is surrounded by people building science kits and other new products, and they are happy to explain to her, in intimate detail, how these work. She wants to take basic biology classes but says, “I am realizing that I have to provide these classes through BioCurious in order to make them affordable, do it around my schedule, make it fun, and around people who I like.” BioCurious is a hacker space for biology, a place to access classes and equipment and meet collaborators. It is a place where “you don’t have to be a scientist to learn science.”

Eri keenly understands the need for mentors and teachers as an integral part of the learning experience. “I want someone to get in front of me with a list of things that I need to learn,” she says. “Good teachers learned the right way to transfer information, the right order in which to present information.”¹¹ So online learning

does not spell the end of teaching; it calls for good mentors and teachers to operate in new ways, to work within communities of learners, realizing and taking advantage of how widely distributed information and resources are becoming, empowering students to learn on their own terms and in ways that fit them. In this environment, we need to reframe the role of instructors, lecturers, and professors and see them instead as social designers. In [Chapter 1](#) I talked about the leaders of socialstructing efforts as community organizers rather than managers. This model holds for education. In the era of socialstructured education, teachers need to be able to design and organize learning communities, whether in classroom settings, in meet-ups, or in other places.

Don Finkel, a former professor at Evergreen State College, wrote eloquently about this in his book *Teaching with Your Mouth Shut*. There he argues that “a teacher’s job is to shape [the educational] environment in a manner conducive to learning”—that is, to create social and physical conditions that inspire students to learn.¹² He approaches learning as a designer, as a community organizer. Every “learning design” that he offers in the book and that has worked in his classes aims to create an intellectual community that propels participants to want to figure things out for themselves rather than for a grade. Content is cheap; inspiration is priceless.

When learning is recognized as a social experience, the boundaries blur between teachers and students, between givers and takers of knowledge, between passive and active participants in the learning process. Andy Rhimes learns about biomimicry from an older person in a meet-up. But he is not only a passive learner, he is also a contributor, giving something back to the community as he inputs information on the building he is studying. Banking on the old adage that the best way to learn something really well is to teach it, socialstructured education turns everyone into an active learning contributor. Recognizing this, Howard Rheingold, a lecturer at Stanford and the author of numerous books on collaboration and technology, gives students in his online class Rheingold U the option of serving in different roles: as searchers (people who search for resources and upload them to the common site), note takers (those who take notes and share them with the group), summarizers, and so forth.¹³ Rheingold U is a community learning space in which everyone is a learner and a teacher, a beneficiary and a contributor. Rheingold calls this approach to

teaching peerology.

Another platform that fosters community learning and recognizes the blurry boundary between teachers and students is Skillshare, a community marketplace in which anyone can learn almost anything. “We believe that everyone has valuable skills and knowledge to teach and the curiosity to keep learning new things,” the site proclaims. “This means our neighborhoods, communities, and cities are really the world’s greatest universities. Our platform helps make the exchange of knowledge easy, enriching, collaborative, and fun.”¹⁴ All of the classes offered by participants in Skillshare happen outside of a classroom, in the belief that learning is social and happens around shared interests and passions, and that “when you bring together a variety of voices and hands-on instruction, something truly spectacular happens. This magic just can’t be replicated over a webcam and chatroom.”¹⁵

Perhaps one of the most interesting experiments in socialstructured learning that occurs in microsegments and is highly community-driven is a project called 100 Days of Spring.¹⁶ It was organized by Will Greene, a musician and videographer, and Sam Haynor, a chess champion and journalist, who worked together at a children’s summer camp. 100 Days of Spring transformed a former boutique clothing shop neighboring an auto body shop at 1592 Market Street in San Francisco, into a community learning space. For a hundred days, people offered to teach something they were interested in and anyone could sign up to take their classes. Teachers ranged from programmers and mathematicians to graffiti artists, dancers, and musicians. The event spilled out into the street and served as a mass community celebration with music, dancing, and art. The motto of the organizers is “Teach something. Learn something. Create something.”¹⁷ After all, socially created learning not only enriches individuals, it also makes for a better community.

Beyond Grades: Intrinsic Rewards and Meaningful Learning Currencies

One of the hallmarks of socialstructuring is reliance on intrinsic rewards and motivation, people doing things not for money but for myriad other social reasons: the desire to belong, be recognized, learn, accomplish something, or contribute to a

community. So what is the equivalent of money in the educational economy? Grades and test scores (which are what most grades are based on), of course. Grades are something you can count like money, accumulate (think GPAs), and use to gain entry into the next level of the institutional ladder. However, just like money, grades replace intrinsic with extrinsic rewards, in most instances taking pleasure and self-direction out of the process of learning.

Shawn Cornally, a high school science and math teacher in rural Iowa, laments this situation in his essay in *Good* magazine entitled “ ‘Will This Be on the Test?’ An Overemphasis on Grades Might Be Killing the Desire to Learn.” No matter how exciting the material is, or how hard he tries to engage his students, the specter of grading always creeps into his lessons. “This is fun and all; I’m learning and stuff,” his students say, “but will this be on the test?” Or worse yet: “How many points is this worth?” “Why isn’t the learning good enough?” asks Cornally. “Why are we so obsessed with ranking education? Does that even make sense? I would argue that it doesn’t, and that our schools are the worse for it.”¹⁸

Alfie Kohn, an educator and the author of a dozen books, including *No Contest: The Case against Competition* and *Punished by Rewards: The Trouble with Gold Stars, Incentive Plans, A’s, Praise, and Other Bribes*, looked at a whole array of studies on educational achievement to come to this disturbing conclusion: “Students who are given grades, or for whom grades are made particularly salient, tend to display less interest in what they are doing, fare worse on meaningful measures of learning, and avoid more challenging tasks when given the opportunity—as compared with those in a non-graded comparison group.”¹⁹

As I asserted earlier, grades and tests may provide an easy and convenient way of sorting people for potential employers, but they actually serve as a turn-off to authentic learning. They also prove to be poor predictors of longer-term performance and in-depth comprehension. Decades of research on various performance tests—SATs, grades, NFL scouting scores—all point out that there are huge differences between what researchers call maximum performance and typical performance. In a pioneering 1988 study, psychology professor Paul Sackett tested supermarket cashiers’ item-scanning ability. Each cashier was given four carts to process and told he or she was being monitored for speed and accuracy.²⁰

It was what the researchers called a “maximum performance” test, much like the SATS, GREs, or the kinds of tests they use to draft sports athletes. Researchers found that cashiers who were star performers under test conditions did no better than average when their performance was observed over a four-week period. Their typical performance was the same as that of the nonstar cashiers. Since then, research has found this same discrepancy in performance in professional athletics, law, and education. People who perform well in high-stakes situations, that is, who do well on maximum performance tests, do not do well compared to others on measures of typical performance. People who know they’re being tested are highly motivated and focused to do well. However, maximum performance measures have nothing to do with success outside of such test environments and over the long term. On the sort of test that measures typical performance, character traits that have nothing to do with maximum performance—grit, perseverance, social skills—influence the outcome. This is why a straight-A student in high school may not be successful in the workplace or in life, and why a C student may do quite well outside of the classroom setting.

It’s easy to understand the allure of the maximum performance measures we subject young people to. They don’t take very long, so we can quantify many people. They make assessment seem relatively straightforward, reducing the uncertainty of selecting a college applicant or a football player. In other words, many of these measures suit the needs of institutional production: efficiency, speed, and cost. But such high-stakes tests are often spectacularly bad at predicting performance in the real world.

There are many alternatives to assessing performance based on grades and tests. At Peninsula, teachers have a very good understanding of each student. This understanding comes from daily interactions inside and outside the classroom, many conversations, and knowledge of each student as a human being rather than just a student. The scenario reflects this; Andy’s mentor, Tom, can assess how he is doing because he interacts frequently with Andy and can see how he has done on various tasks. In any work situation that requires group collaboration, participants can provide pretty good assessments of other team members—their skills, shortfalls, and capabilities. They learn about these not through tests but in the process of working

and interacting with each other. Yes, such assessments require time and deeper levels of interaction. They may be less efficient, but ultimately they're more meaningful.

We can also learn about alternative assessments that motivate achievement from the realm of gaming, where players can fail many times but are motivated to improve in order to achieve a higher level in the game. As the game designer Jane McGonigal points out in *Reality Is Broken*, players are always operating at the edge of their abilities; if the task is too easy, the game is not interesting, but if it is too hard, they simply can't play. So they are constantly failing and working to get better, climbing to the next level. No B's, C's, or D's are needed; game players have to master one level in order to move on to the next.²¹

One of the attractions of the Khan Academy is that students are able to redo their work on tutorials as many times as they need to, thus achieving mastery at their own pace. This is in contrast to the traditional approach, whereby all students have to learn at the same pace and during the allotted time, creating what Salman Khan calls "Swiss cheese gaps."²² Regardless of how fully a student has grasped a given concept—sixth-grade algebra, for instance—at the end of the semester that student either passes or fails. Students receiving a C go on to the next level of math, despite not having fully grasped all the necessary concepts to be successful there. Over time, gaps in a student's education start to reveal themselves, and these gaps expand exponentially as the years pass. All of a sudden, a good student starts failing calculus because he hasn't achieved mastery at earlier levels, and this erodes his confidence in ways that reinforce self-perceptions of inadequacy or even incompetence.

In contrast to this Swiss cheese model, some institutions, like the Quest to Learn charter school in New York City, are beginning to use the principles of gaming to organize the curriculum and assessment as a series of missions and quests. Each quest poses a problem students have to solve, either by gathering relevant resources, doing mathematical calculations, reading and analyzing texts, or doing a range of other activities. There are no grades. However, it is only when their mission is completed that students can move on to the next level.

Back to the Future

Socialstructured education may seem like a radical departure from current practices in most educational settings. Microlearning, an abundant ecology of online and real-world resources and tools, the leverage of intrinsic social motivation and gaming principles—these are all elements of the future. But the foundations of this kind of education lie far in the past. Leading philosophers of education, from Socrates to Plutarch, Rousseau, and Dewey, talked about many of these ideals centuries ago. It was Plutarch who famously said, “Education is the kindling of a flame, not the filling of a vessel.”²³ And good teachers and mentors, with the help of peer communities, have the power to ignite and feed that passion. Young people are natural scientists, natural discoverers; all they need is someone to help them discover and to discover along with them. A Peninsula parent once told a story of his daughter coming home from a kindergarten field trip very excited. When he asked her, “So, what did they teach you on the field trip?,” she looked at him quite bewildered. “Daddy,” she said, “they don’t teach us anything. They help us figure things out.”

At the dawn of the twentieth century, the educator and philosopher John Dewey reimagined not just the way the learning process should take place but also the role the teacher should play in that process. According to Dewey, the teacher should not stand at the front of the room doling out bits of information to be absorbed by passive students. Instead the teacher’s role should be that of facilitator and guide. As he wrote in 1897, “The teacher is not in the school to impose certain ideas or to form certain habits in the child, but is there as a member of the community to select the influences which shall affect the child and to assist him in properly responding to these influences.”²⁴ The teacher is but one partner, one guide, a co-discoverer in the learning process.

Socialstructured education actually brings us back to a future envisioned by Socrates, Rousseau, and Dewey, but with a whole new set of tools—everything from the Khan Academy to smartphones and augmented reality to learning community meet-ups. These tools and platforms make it possible for us to pursue education that is individually paced and intrinsically motivated. We can use these tools to make the dream of Socrates, Rousseau, and Dewey a reality. We can create the kind of rich, meaningful, de-institutionalized education they envisioned.

Don Tapscott, a management consultant and the author of more than a dozen books on applications of technology in business and society, including *Wikinomics* and *Grown Up Digital: How the Net Generation Is Changing Your World*, wrote in an essay in *Edge* magazine in 2009, ominously titled “The Impending Demise of the University,” “Universities are finally losing their monopoly on higher learning. . . . Specifically, there is a widening gap between the model of learning offered by many big universities and the natural way that young people who have grown up digital best learn. The old-style lecture, with the professor standing at the podium in front of a large group of students, is still a fixture of university life on many campuses. It’s a model that is teacher-focused, one-way, one-size-fits-all and the student is isolated in the learning process.”²⁵

It is ironic that Tapscott echoes what Dewey was preaching more than a hundred years ago. It is not just “young people who have grown up digital” who don’t learn well in lecture-style mass-produced educational settings. No one learns well in such settings. And an increasing number of experts are saying just that, criticizing the existing system and calling for its demise. Some, like Bill Gates, even question the need for schools at all. In a keynote address at Techonomy 2010, a major technology and society conference, Gates provocatively says, “There’s no room for innovation in the standard system.”²⁶

But Gates and other techno-utopians are wrong to assume that online universities and schools can fully replace the face-to-face learning that has traditionally occurred in classrooms and lecture halls or in Socratic dialogues and interactions between mentors and students. What these proposals ignore is something Rousseau, Dewey, and other good educators understood so well: social interactions and physical experiences play a key role in the learning process. This is what teachers at Peninsula School know and practice on a daily basis. This is what Quest to Learn, 100 Days of Spring, Skillshare, and many other experiments are trying to leverage. They combine the best of technologies with the best of communities to enable learning that is meaningful and enriching to both the individual and the community. Their hard work and ingenuity are gradually turning Andy’s scenario, and my dreams for the future, into reality.