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Disaggregating the Components of a College Degree

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Unbundling Education

There is no polite way to say it: the private sector is coming for education, and American society should embrace it. Entrepreneurs are one of a set of forces that will challenge the existing system of higher education as we know it. Many will do so unintentionally, for the most part, or even with the best of intentions. Some are even partnering with existing postsecondary players. But the higher education system is increasingly threatened, more than at any time in history. While our policymakers should foresee a potential national crisis, as millions of employees and thousands of communities rely on these institutions, as a society we should hope for better options for the next generation. There is a way forward in which nearly everyone can emerge as a winner, but it requires the fast application of the principles of survival for organizations that are being disrupted and disaggregated.

Entrepreneurs see a window of opportunity because higher education has become far too expensive for many students. Rather than embracing innovations that have swept over the rest of the economy, boosting productivity, lowering prices, and improving quality, most colleges and universities have chosen to batten down the hatches, raise tuition, and hope for the best.

The social consensus that our higher education system is the “best in the world” has taken a dark turn. Many public figures have brought attention to the state of higher education recently. Mark Cuban, a famed entrepreneur and recipient of lucky money from the first Internet boom, wrote a viral blog post about higher education's unsustainable cost structure.¹ Robert Reich, the proudly liberal former secretary of labor under Bill Clinton, wrote a piece called “The Commencement Speech That Won’t Be Given,” in which the message to graduating seniors was “You're f#\$%@.”² “Sixty Minutes,” America’s most august news program, spent half an hour profiling PayPal founder and vocal higher education critic Peter Thiel.³ Thiel’s new fellowship

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program calls on gifted college students to drop out and become a Silicon Valley entrepreneur. Though Peter Thiel can be contrarian in his views, many are starting to notice that blind faith in college degrees has led to an irrational market, and this irrationality has let inappropriate business models grow despite providing too little value at far too great a cost.

What's the problem? In "Disrupting College," Clayton Christensen and co-authors argue that the escalating cost problems in higher education spring from "conflated business models."⁴ A conflated business model is when an organization juggles too many ways of bringing in revenue, making it difficult to balance them all effectively. Ultimately, this leads to administrative overhead and other inefficiencies.

Christensen boils down business models to three types: Solution Shops, Value Added Processes, and Facilitated Networks. Solution Shops present groups of experts with a complex problem or unknown in order to find a solution or breakthrough. Examples include the consulting industry or medical diagnostic labs. Value Added Processes try to use best-in-class procedures for taking an input and creating a product of greater value. Most manufacturing would be considered a Value Added Process. A Facilitated Network grows a community of parties that are interacting with one another, and the business model is to extract or create value out of their interactions. Social networks, dating sites, auctions, and marketplaces are clear examples of this.

"Disrupting College" notes that postsecondary institutions have to simultaneously operate a Solution Shop, a Value Added Process, and a Facilitated Network. A university has to be a research facility that collects specialists to diagnose problems and find solutions; serve students; add value to their lives; increase their ability to contribute in the labor market; and facilitate the

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network of organizations, athletics programs, faculty, graduate students, and alumni in a manner that creates value out of the entire system.

According to Christensen's years of work on the subject, no business can sustain more than one business model in the long run. This point is made in most case studies where businesses are operating two business models at once. Universities have to juggle three, while trying to simultaneously control costs and increase quality. Christensen judges that no policy nor leadership reform could effectively control costs and increase quality at once within the existing model, as the operating complexity of the institutions within the current system is simply too great to manage.

The Internet has challenged business models that serve bundled services by offering unbundled alternatives. Offering direct access to targeted services tends to disintermediate (the process of cutting out middlemen between producers and consumers) institutions whose value proposition relies on placing a premium on the aggregation of services and resources. We have seen these forces disrupt the music and journalism industries, and similar forces are beginning to affect the education sector.

The coming unbundling will not only take apart the three business models that Christensen argues cannot effectively exist within an organization. Indeed, emerging efforts will likely go much further, breaking the student experience up into its component parts. And some of those components will be much more readily unbundled than others. While it is amusing to think of the spinning off of athletics franchises or dining halls, here I'm going to hone in on the "value added process" job of a university: to serve students. The assumption embedded here is clear: even this value added process can and will be unbundled.

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The unbundling of higher education is not likely to cause the immediate dissolution of college and thus a collapse of our education system. But I'm also not sure if I agree with Salman Khan that "there will always be a place for luxury, residential colleges."⁵ One could easily believe that the American economy will not need traditional residential institutions in the supply that we have them. The introduction of competition is, however, likely to create a sense of urgency around finding new models of delivery and management techniques, creating new roles for faculty, and innovating around alternative means of facilitating postsecondary education.

But this competitive pressure will not apply equally across all of the jobs that colleges and universities currently do. On the contrary, some elements of postsecondary education are prime targets for insurgent providers with new, low-cost models, while others will be much more difficult to provide online or in other new formats. The goals of this chapter are to identify the various jobs that colleges and universities currently undertake as part of their "value-added process," identify which of those are easier and harder to unbundle, and describe some of the ventures that have emerged to provide some part of the postsecondary experience. The point is not to argue that these entrepreneurs will replace the existing system, only that their presence suggests a market opportunity to which higher education institutions would be wise to respond.

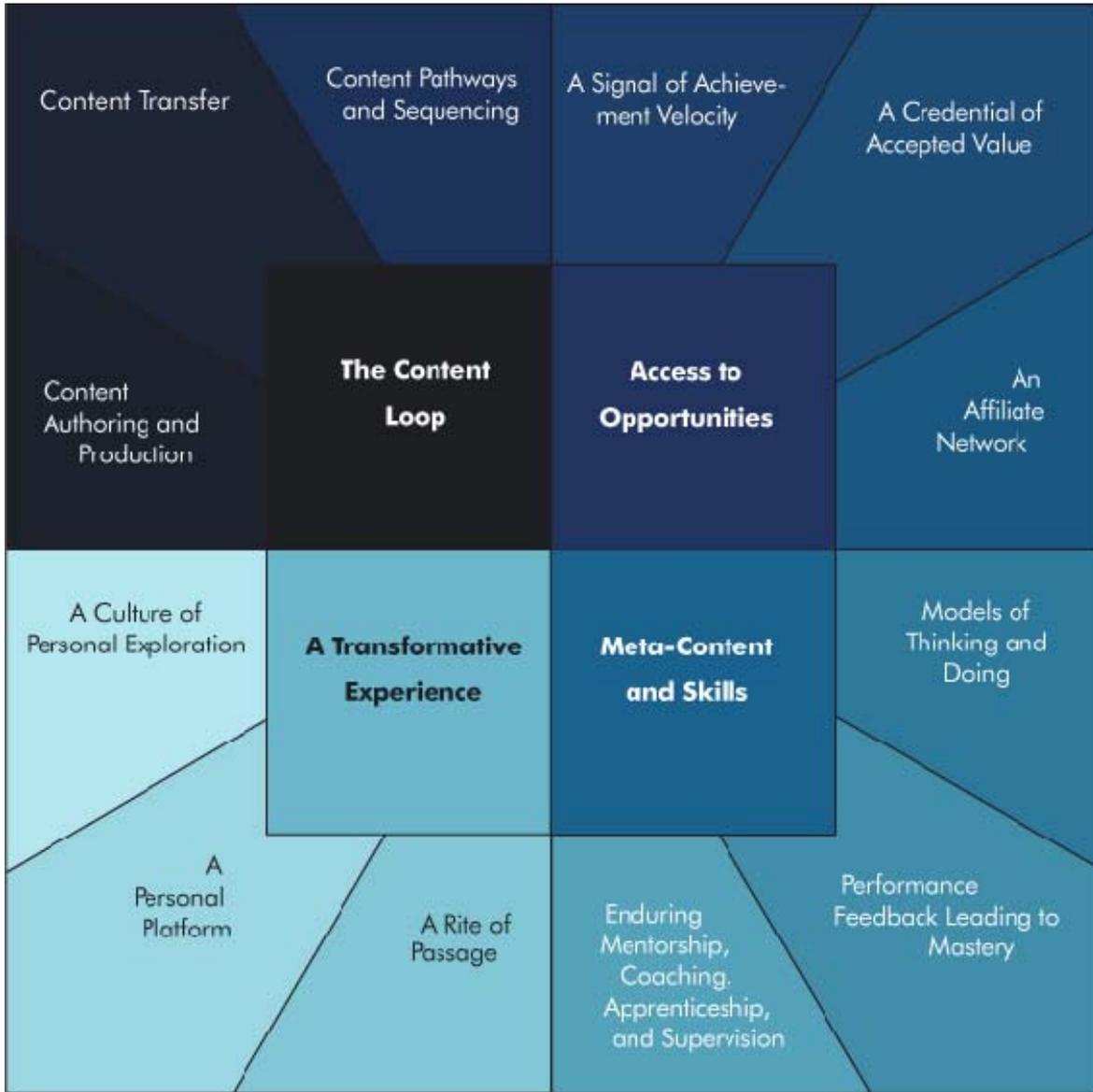
What Is College? Taking a Look at the Component Parts

What is college? We are defining it here as a packaged *bundle of content, services, experiences, and signals* that result in an education with both inherent and transferable value to the learner. The end goal of this educational package is to prepare learners for the job market, as well as to instill the knowledge, procedures, and values that make individuals effective at navigating,

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succeeding within, and adding value to our society. The bundle is outlined here in the below diagram.

Figure 1: College: A Packaged Bundle



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The Content Loop

A large piece of what we refer to as “education” is tied up in what I call the Content Loop: lectures, readings, notes, and studying. The professed goal of the Content Loop is to move the learner to a minimum standard of understanding. To accomplish this among students of varying abilities, an ideal system is designed as a closed loop with additional enrichment for the faster learners and a safety net that catches those who need additional help so they can meet the minimum standard. This ideal is very difficult in any context, and few instructors ever achieve it. From my perspective, the content loop involves three coherent jobs: Authoring and Production, Transfer, and Pathways and Sequencing.

- **Content Authoring and Production** is the energy around creating lectures, gathering readings, and some aspects of professorial publishing. Any time an instructor puts into creating materials that need to be read, watched, or otherwise interacted with, they are in a sense re-creating content for each class.

- The traditional format of **Content Transfer** is a lecture and discussion, assigned readings, and texts. This is an imperfect format for the transfer of information from instructor to pupil. The process of content transfer is starting to move into electronic delivery in myriad forms.

- Content is rarely delivered without a broader context. Rather, it is woven together into a course or series of courses that create a pathway to understanding. Instructional design is an emerging profession that acknowledges the **Content Sequencing and Pathways**, the packaging of content, needs more deliberate practices than most assume.

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The benefits of technology in the Content Loop are clear—scale, automation, and the personalization of pace, media, and modality are all not only possible but already underway.

Access to Opportunities

The value proposition of education that seems to matter most to most students (and to policy) is Access to Opportunities. Our higher education system, in theory, fills the job market with prepared knowledge workers. Aligning the output of graduates with immediate openings in the job market is an ideal, and this kind of supply-demand match does not often influence institutions as much as it should. In order to provide students with access to opportunities after graduation, postsecondary institutions have three tools at their disposal: a Signal of Achievement Velocity, a Credential of Accepted Value, and an Affiliate Network.

- **The Signal of Achievement Velocity** is interpreted from *U.S. News World and Report* rankings on selectivity. There is an admissions tournament, and the brightest high school students are thus let into a hierarchy of institutions, about which society seems to assume a certain trajectory of achievement and success. Those who get into Princeton, many assume, will on average outpace those who get into Texas A&M. Take away the four years of school, and the tournament still sends similar signals about those who “got in” to selective schools.

- School is not just about the admissions process, it adds value with the education provided. **A Credential of Accepted Value** communicates a certain rigor and minimum expectations about the skill sets and knowledge base of graduates. So while Texas A&M may not beat out Princeton in the admissions game, their degree holders in engineering may have more value than those who majored in “softer” subjects at Princeton. Open enrollment

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institutions can only focus on this aspect of the Access to Opportunities value proposition to students.

- **An Affiliate Network** enables access to opportunities through a set of institutional relationships as well as the facilitation of the near complete acceptance and due treatment of its members. Think of alumni who act as gatekeepers to opportunities or information brokers about navigating career transitions. Institutions often directly create relationships with employers who continually find graduates fit for the jobs they have open.

The conventional wisdom has typically been that higher education and Access to Opportunities are one and the same. However, tying graduates' future job prospects to institutions that see job preparation as an ancillary purpose seems ill-fitting and inefficient. Technology is disrupting this part of the higher education value proposition as finding information about individuals becomes easier on the Internet, specialized software enables the massive processing of candidates, and individuals are increasingly able to signal their own value to the market with alternative signaling methods.

Meta-Content and Skills

While the Content Loop is all about information transfer, there's a deep agreement that much of the value of "teaching" is not strictly about the transfer of information. Instructors serve as a major touch point from a complex system that intentionally or unintentionally imparts "meta-content" in addition to both soft and hard skills valuable in a democratic society and to our labor market. The transfer of meta-content is accomplished by modeling thinking and doing and by providing mentorship, coaching, apprenticeship, supervision, and various methods of performance feedback.

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- **Models of Thinking and Doing**, from an instructional perspective, are how to present ideas, speak in public, and engage in individually-driven discovery, research, analysis, and writing. Other unintentional models include how to navigate bureaucratic systems including administrators and policies.

- **Mentorship, Coaching, Apprenticeship, and Supervision** are also embedded into our higher education institutions. Though often inconsistent, indirect, and with ratios of staff and professors to students that prevent achieving the intended relationship, institutions create an environment where these relationships are sometimes actively facilitated, but often spontaneously created across age groups.

- Most institutions attempt to provide accountability structures, incentive systems, and other opportunities to give **Performance Feedback**. For trades there are exit exams, and advisors often have to “sign off” on a person's coursework. Upper level courses often require students to practice some form of work with a greater degree of mastery, under the assumption that most graduates are ready practitioners of, well, something.

In the end, while the Content Loop is important, the qualities we most value in the college-educated come from this meta-content and skill practice. We want productive workers, active citizens, and members of society fluent in fundamental cultural understandings and practices.

A Transformative Experience

At least within the dominant narrative, one of the priceless values of a college degree is the inherent personal transformation that takes place as a consequence of being in a residential college for four years. While this traditional trajectory is no longer the typical college

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experience, it is nonetheless the inspiration for much of the value of college. To enable this personal transformation, college is assembled as a rite of passage, thought of as a personal platform, and facilitates a culture of personal exploration.

- A **Rite of Passage** is a relatively unique series of experiences that create a common bond between participants, often regardless of time. This creates a multiplier on the affinity network, and also allows individuals aware of the brand to make assumptions about another graduate's experience.

- Most decisions about pursuing a degree are not centered around "learning." For the undergraduate, it's about moving from blue-collar or hourly-wage work to white-collar careers with an upward trajectory. For graduate degrees, the decision to attend is often a career reinvention. For this, people do not just go to the library or get a certificate for learning they have received on the job, they seek a **Personal Platform** that serves as an accepted staging ground to move to a different career trajectory.

- In the undergraduate context in particular, the student experience is set up as a community of people that are coming of age and need a **Culture of Personal Exploration**. The iconic "undecided" major is popular for one reason: in the United States, we feel that most 18-year-olds are not required to have made decisions about their life's career track. They should be able to "test" out ideas, disciplines, and communities of practitioners before making up their minds.

While policy may be focused on the concept of access to opportunities, middle class and upper crust families, as well as those in a mid-career rut, are buying a personal transformation.

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Which of these Services are (Ir)replaceable?

For convenience and effect, I now lay out in more detail the services currently provided by a college experience, as I see them, in order of their “replaceability” by fragmented, simplified services on the Internet. In the diagram, the more replaceable services are dark, moving from easily replaced to services that would be rather difficult to replace with technology. I will illustrate market entrants that could serve as an alternative service provider for these specified services. I will then provide commentary on what higher education, and the institutions that provide it, should do to prepare, react, survive, and thrive in a world that is challenging their current economic and educational models. One of the great ironies of the coming disruption is that schools spend most of their time focused on the services that are the most easily replaced. It is likely that their first response to competition should be to retreat into focusing on the less tangible aspects of the college experience.

Many of my examples are defined by my own experience and view of the world, which is wildly tainted by the ecosystem of innovation in Silicon Valley. It is perhaps Silicon Valley's own hubris that leads me to believe that what is true here and in my sector (emerging technology companies) will thus be true for the rest of the world.

The Content Loop

1. Content Authoring and Production

Easily replaced, easily embraced.

With the rise of inexpensive and accessible content production tools (particularly video and interactive presentation), the winds of technological change are blowing in favor of the individual expert as a content producer. Almost anyone can make their own website, textbook,

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or video series. Many a teacher and professor has spent endless hours "reinventing the wheel," creating their own content. However, moving forward, non-experts will be curators of content rather than producers.

As a baseline, the first area to really shake up the ecosystem may be interactive textbook providers, as they are on the verge of reinventing content as we know it. Inkling, a provider of digital books that features textbooks in a number of disciplines, raised \$17 million in funding, with Pearson and Sequoia participating.⁶ Kno, creator of a textbook app for the iPad that boasts 70,000 titles, has raised \$90 million in funding over three rounds of investment, including from famed investor Marc Andreessen, the founder of Netscape.⁷ In perhaps the biggest announcement, Apple revealed a content production software package for interactive textbooks, as well as a special place in iTunes for these interactive textbooks called the iBookstore. Three of the country's biggest textbook producers—Pearson, McGraw Hill, and Houghton Mifflin Harcourt—have all agreed to partner with Apple on iBooks 2.⁸

It's not just the textbooks that are being delivered through technology; it's the entire course package. Apple has also sponsored iTunes U, a section of iTunes dedicated to lectures since 2007. Udemy, which hosts an online learning platform on which instructors can create and run an online course, has developed the Faculty Project to incentivize and market course production from top professors at elite institutions.⁹ Udacity and Coursera were both born out of a Stanford Artificial Intelligence course that managed to attract 130,000 learners worldwide at no additional cost to Stanford, a phenomenon now known as Massively Open Online Courses.¹⁰

Increasingly, learners are also consuming content produced by other students. Chegg recently acquired NoteHall, a service where students get paid as note-takers, and an online marketplace for notes has developed. CourseHero and Koofers remain independent and have

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similar value propositions. OpenStudy is a network of learners discussing problems and helping one another. Users can earn special distinction for answering questions quickly or with great frequency, and students can also “follow” their favorite contributors.¹¹ Quizlet now has 17 million learners creating study materials for one another. For every company mentioned here, there are many more providing similar services. There is a near-movement of companies that are trying to make learning content a peer-to-peer phenomenon. While some of these will die off for lack of revenue, and others will be acquired and bundled into some other set of services, the idea of crowd-sourcing content creation directly to and among students is here to stay.

Perhaps the biggest societal impact thus far has come from the Khan Academy, a non-profit with over \$6 million in funding, including contributions from the Bill & Melinda Gates Foundation. At the K-12 level, the Khan Academy has over 3,000 ten-minute video tutorials on most topics in a K-12 curriculum, all created by Salman Khan himself. Khan’s video series has allowed practitioners to experience what many call the “flipped classroom,” the idea that lecture and content delivery can now be done outside the classroom, and the classroom can now be devoted to higher order activities. While Khan’s work has typically focused on K-12 education, he has been critical of higher education quality, particularly the coupling of content delivery and assessment that predominates at colleges.¹² And Khan is just a pioneer: a company called Educreations just raised a significant first round of investment to allow “every teacher to have their own Khan Academy.”

The idea that each professor will need to create, select, curate, or author their own course content is coming to a close. The low-cost delivery of remedial, introductory, and general education courses is already being enabled through technology, as embodied by companies like StraighterLine, which provides access to coursework and assessment on a subscription basis for

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\$99 a month. Even hard-to-find courses like rare languages and occupational training courses are also delivered through the Internet with near ubiquity. At some point, our postsecondary system will realize that unbundling content production will allow valuable instructor time to be shifted to working on higher-order tasks with students. For now, some are shaking in their boots while students dance with iPhones in hand.

2. Content Transfer: Delivery, Monitoring, Assessment, and Remediation

Easily replaced, easily embraced.

Much of what we think of as school involves a Content Transfer. This state conjures students taking notes from lecture and doing the reading. Given advances in technology and changing student preferences, the lecture-based classroom with simple readings can no longer be the primary student experience. Content transfer will be accomplished through rich media—video, games, text, and interactive graphics, diagrams, and illustrations. This opens up two distinct possibilities: adaptive learning and the flipped classroom.

In his highly engaging stump speech, Adrian Sannier, the vice president of product for Pearson's eCollege, tells a tale of finally getting access to James Taylor teaching how to play his songs on high-fidelity video. He recounts going through guitar teacher after guitar teacher, but never really mastering the skill sets and the songs he wanted to learn. After seeing James Taylor's tutorials in online video, he declared that online multimedia clearly trumps in-person instruction. “You just can't tell James Taylor to play the same melody, at half the speed, 84 times in a row,” explained Sannier.¹³

More important than rich media are sophisticated programs that can efficiently move students through content and ensure that all students are meeting a minimum standard of

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knowledge and comprehension. Content will have various programs running behind it, allowing instructors and others to monitor progression and assess competency. It will also include automated monitoring (the injection of small questions to assure learners are progressing with the content), assessment (quizzes that assure a minimum level of retention and understanding), and remediation (the additional content assigned to learners to make up for any shortcomings in that understanding and retention). Thus, we can move to a self-paced and competency-based system of education. This type of system, especially when owned by one piece of software, is referred to as an “adaptive learning platform.”

Adaptive learning platforms have also been receiving unprecedented levels of venture capital. Knewton, an “adaptive learning platform” that tailors instruction in response to student work, has raised \$54 million dollars in funding. Arizona State currently powers its remedial math and blended courses with Knewton’s platform.¹⁴ Grockit, a near competitor, has raised \$22 million in funding. Altius Education, progenitor of Ivy Bridge College with \$26.6 million in funding, recently released “Helix,” a similar adaptive learning platform with human grading systems for more complex assignments.

There is also the possibility of an unbundled adaptive learning platform. On the assessment side, services like ProctorCam, a startup out of Boston, have found ways to verify the identity, focus, and integrity of the assessment according to data captured from simple cameras included in computers currently sold. Services like these get around the need for human proctors for online assessments. Western Governors University now uses webcams to proctor exams remotely, providing the hardware to students when they matriculate.¹⁵ MasteryConnect, a tool for K-12 teachers, is entirely focused on the delivery and grading of multiple choice exams. These kinds of technologies will eventually become “plug-and-play,” allowing more and more

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schools and individuals to create their own adaptive learning platforms that guide learners through a Content Loop.

Higher education should actually embrace this movement by allowing students to learn basic content and go through their general education courses online, freeing up instructors to focus on more advanced courses and focus classroom time on higher-order comprehension, analysis, synthesis, and forms of project-based learning.

3. Content Sequencing and Pathways

Hard to do well without significant authority. Difficult to individualize without personalized data sets. Currently unchallenged. Should stay core through course design and degree requirements, but needs dramatic improvement through technology.

In theory, school offers coursework in pathways (a road that leads to an end result) that takes the learner through a sequence that builds increasing understanding and mastery in the face of increasing complexity and breadth. Again, this is based on the assumption that those defining curriculum pathways were the leading accessible authorities, but this is no longer true. Many instructors will thrive as a curator of content loops and building blocks; others will relegate this to the apps that will provide adaptive sequencing and pathways.

Students will have easy access to curriculum packages that are more constructivist, provide scaffolding, and have a tighter alignment to either the standards of the system or the job market. Like in Plato Learning and Rosetta Stone, the sequencing and pathways will often be embedded in an entirely bundled Content Loop provider. Other times, the pathways themselves will be a service of aggregating and making sense of all of the content.

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New market entrants are providing content sequencing and pathways through content curated by experts. MentorMob and LearningJar are early but notable in this regard. They encourage users to group and sequence content into “playlists” in MentorMob and “jars” in LearningJar. MentorMob has seen early success with educators, while LearningJar is focused on technology entrepreneurship personalities.

In the realm of traditional degree granting, Austin Peay State University built and launched Degree Compass, a course recommendation engine that attempts to make course selection akin to getting books on Amazon or movies on Netflix. “We've got a pretty strong assurance that we're able to steer students toward courses they will be successful in,” he says, “better than they're able to steer themselves,” says Tristan Denley, the provost of Austin Peay.¹⁶ Private companies are also in the “course selection” game. Services like MyEDU are working on similar capabilities.

Higher education should invest in more thoughtful sequencing and pathways in two ways: 1) show closer links to advancing competency and mastery over interdisciplinary domains, and 2) more closely align programs to the needs of the job market. Utilizing technology platforms to achieve this, perhaps even allowing the technology to own it, is likely.

Access to Opportunities

4. A Signal of Achievement Motivation and Velocity

Easily replaceable. Web services should be complemented with individual coaching and even become a core part of the curriculum.

More often than not, graduates are finding work in fields where they are expected to learn on the job, and their academic programs had little to do with the skills and knowledge they need

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in their career. In this instance, a degree is a signal to the job market that corresponds more closely to motivation, socialization, and learning capability than to previous competency.

“Twenty under 20,” a program developed by Peter Thiel and Founders Fund, an investment firm in San Francisco, actually gives \$100,000 to each of the twenty top-performing students to “stop out” or opt out of college to pursue ambitious projects that may lead to significant advances across different industries. The Thiel Foundation actively markets the program as being only for the world's most precocious minds in STEM areas under twenty years of age. They received hundreds of applicants, thus making them an equivalent filtering process to a highly selective university. Even more impressive, nearly all of the applicants were trying to leave the most selective universities to pursue the fellowship, making it the world's most selective filter on top of the world's most selective filter, like the Rhodes or Marshall Scholar programs.

While the Thiel Fellowship only started a conversation nationally about the value of college, in the Bay Area technology scene it has awakened the notion that we can be more impressed with alternative signals than admission to or degrees from selective schools. Those deep into science and technology innovation understand that it's likely these twenty individuals have a higher achievement motivation and velocity than those headed to institutions like MIT or Stanford.

Even before the Thiel fellowship, Americans had developed folklore around the “college dropout.” Mark Zuckerberg, following in the footsteps of Bill Gates and Steve Jobs, further cemented the notion that success in the world need not be correlated with success in higher education. Even more enviable, this folklore posits that those with the greatest achievement velocity not only emerge the victors in the tournament to get into college, but then also escape

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the trappings of four years of college to go achieve in the real world by building giant business empires.

While Twenty under 20 is not an online service, what makes alternative signals potent in an online world is the speed at which you can look up other signals and dissect what they mean. Elite memberships, application programs, test scores, etc. are all just a click away and verifiable to boot. As the narrative of success regarding college dropouts increases, and stories about unemployable college graduates continues to echo, people may start to see that easy-to-access signals of achievement velocity can provide much of the value of a college degree.

Higher education will ultimately need to embrace these emerging online signals of achievement velocity, perhaps including the art of online signaling as part of their programming. In the end, students graduating with a degree should be more capable of assembling an online portfolio of signals than those not pursuing a degree.

5. A Credential of Accepted Value: Fundamental Understandings and Estimated Competency

Challenging to replace in certain circumstances, but easily replaced in others where visualizing skill sets or normalized assessments are common. Also should be complemented with individual coaching and even become a core part of the curriculum.

Despite the importance of signaling achievement velocity, the postsecondary degree is still based on the notion that the credential represents some estimated level of competency that employers can use to determine expectations about what a student knows and their corresponding capabilities. Given the variation in content and quality across the education system, people are starting to acknowledge that a diploma sometimes does not correlate tightly

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enough to demanded skill sets. An executive at the startup Minerva University calls the current accreditation bodies a “guild system designed to limit supply.” Given the difficulty of becoming a degree-granting institution, the expense of accessing a degree-granting institution, and the ease of creating signals, portfolios, and profiles online, the credential of accepted value is finding other forms.

Many potential employers seeking specific skill sets already require additional signals such as a portfolio of work, or the completion of exercises during the recruiting period. Students already spend significant time preparing for the recruitment process in fields such as engineering, architecture, biotech, graphic design, and animation. As people develop their identity across the web, the need for an abstract piece of paper as a credential of accepted value is rapidly diminishing. Matt Greenfield of Stonework Capital even has a framework for investing based on what he calls the “credentialing stack.” Given that much of what students are willing to pay for is access to opportunities, it's no wonder that investors are very interested in how to disaggregate the credential from the rest of the college experience.

The Internet is introducing alternative signals that demonstrate skills and proficiency in specific domains of interest. Whether it be assembling prior work, answering challenging questions for others, or gaining a reputation amongst networks of users, these online signals have already become core to finding employment opportunities in domains like software engineering. Jon Bishke, a highly regarded entrepreneur in the EdTech space, said on TechCrunch TV that “StackOverflow and GitHub are the new Computer Science Departments. It's where people go to learn. And increasingly it's where people go to see more about a person.”¹⁷ Both StackOverflow and GitHub have individual profiles where you can see work samples and other bits of valuable information when assessing someone's qualifications.

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Similarly, designers can now be evaluated by a quick view of their online portfolio. One of the most popular, Dribbble, is home to thousands of designers. Designers can follow one another, and their work can be “loved” by the community of users. Many employers, including this author, use Dribbble as a way to filter and scout design talent, rendering attendance of design school moot. Entelo, Bishke's brainchild, aggregates these online profiles and allows potential employers to efficiently search through potential candidates, enabling them to explore what Bishke' calls the “Reputation Graph” across many different sites that have online profiles.

A soon to be launched service called Degreed is a site where students can enter their coursework, irrespective of the school or even whether they are part of any school, and it will compute a score of estimated competency. Similar to a “Klout” score, it can supplement a resume or job application. Employers can look up anyone. Degreed was one of the winners of the “Open Badges” competition, and is made up of esteemed founders notable in the education space, including Zinch and Flat World Knowledge. In the words of founder David Blake, Degreed is out to “Jailbreak the Degree.”¹⁸

Smarterer is a quizzing platform that employers can use to see an applicant's competency in a particular skill. Someone looking to demonstrate their proficiencies can take quizzes on the basics of Microsoft Office or the Mac OSX. Employers who would like to add additional screening to their applicants can use a feature called “Skill Sets” to include in their application process. Having just landed \$1.75 million in investments in June 2012, they are a new company with more potential than progress. Still, it is easy to imagine a future where employers can identify prospective recruits or screen applicants through an easy to use assessment system. If reported performance on these assessments becomes a credential of accepted value, then it may contribute to additional questions about the value of an expensive degree.

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Similar to the prior signaling discussion, higher education needs to reformulate existing coursework into projects of authenticity and significance, ensuring that the students amassing skill sets have the opportunity to demonstrate those skills in real world settings and in ways that are captured and communicated to employers more clearly.

6. An Affiliate Network and Community

Easily competed with at low cost. Remains immense opportunity for higher education, though needs a renewed focus. Leveraging emerging affinity networks will be important.

Many colleges and universities, as well as private primary and secondary schools, include membership in their affiliate network as part of their value proposition. Ideally, students create deep and lasting relationships with a network of outstanding peers and active alumni who are resources later in life. An affiliate network is both something people experience at one point in time as well as a provider of interdependent services.

Building a network no longer requires a shared geographic location. Peer learning networks that are tightly integrated with a learner's interests and career path can be found through social networks with a distinct culture of finding and sharing. Learners can easily gain access to peers and peer mentors through the Internet, specifically in expressive disciplines like design and music, where students are likely to have assembled a personal learning network that is their primary source of inspiration and feedback.

In an interconnected world where signaling is easier than ever before, organizations are building exclusive affiliate networks simply off of organizational culture. Sandbox is just such an example. Sandbox has only 650 members worldwide. They have strict criteria for entrance: members must be referred and under thirty years old. Simply put, they are trying to be the

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affiliate network for the most ambitious and clever young minds on the planet. The founders—Christian Busch, Nico Luchsinger, Fabian Pfortmueller, Antoine Verdon, Severin Ruegger, and Noe Blancpain—have even started to claim that they are building a model of education for the future. “We didn't think we were building something in education. But the more it develops, the more we realize we are. I'm sure there will always be a role for some types of schools, but we can already feel a lot of the value of programs like an MBA being irrelevant.” Sandbox, by the way, is free.

Summit Series is another example. While Sandbox has dinner discussions and cocktail parties, and the Young Entrepreneurship Council (a similar invite-only organization) is a few hundred dollars, Summit Series strictly aims to have one magnum party per year, in which they invite accomplished young individuals from around the globe for three days of fun-filled adventure. The cost of the party? Between \$3,000 and \$4,000 per person. While Summit Series could be critiqued as nothing but a party, attendants have become loyal to the brand and looked out for other Summit Series attendees, regardless of whether they are acquainted. It has become an affiliate network in which the values of the network transfer to any relationship between any two individuals. The properties of the affiliate network are so strong that it can even apply to friends of attendees.

Tech incubators also have the properties of affiliate networks. Y Combinator, the most well known of the incubators, is famous for the ways in which it engages its “alumni.” The ability of incubators to recreate an affiliate network (as well as many other value propositions discussed in this paper) has led incubators to be called “the new graduate school.”¹⁹

The question becomes: how can the value proposition of an affiliate network hold for universities in the face of such stiff competition? If they do choose to compete, they will need to

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do a much better job priming their entrants on the cultural norms of the affiliate network, and they will need to instill within each individual the norms of the network. There also must be ongoing consequences for not holding true the norms of the network. More appropriately, postsecondary institutions should try to take advantage of the rise of, and place their students into, these varied affiliate networks.

Higher education should focus heavily on assuring their affinity networks that have the advantage of location are as active as possible. In-person networks could, if organized and supported well, provide more value than those with no physical location or assets. To maintain this advantage, institutions should focus heavily on student culture, peer-to-peer learning, and challenging projects that bring students together in ways unlikely to occur through the Internet.

Meta-Content and Skills

7. Models of Thinking and Doing

Hard to do well. Currently unchallenged. Should stay core but needs dramatic improvement and true focus.

Content delivery is more than “stuff to learn” that will ultimately be assessed by a test. Those with greater understanding of pedagogy are quick to point out that buried within boring lectures is meta-content and models of thinking and doing that are transferred from the instructor to the student. The most common of these is making logical arguments with data and examples. If a class is modeled well, students learn through exercises, problem sets, and individual and collaborative projects. As students move into near-graduate-level work, they begin to understand the rules and formats of knowledge exploration, creation and sharing, and how to navigate complex bodies of knowledge to gain insights, solve problems, and even lead people.

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Instructors, especially at higher levels, are primarily focused on illustrating and giving students feedback on their comprehension of these models of thinking and doing.

Applying content knowledge in higher-order activities is, according to folklore, the backbone of the college experience. Implicitly, learners also understand that in school they will be tasked with collaborative efforts and interactions in a project-based environment that will challenge and build their character and improve their ability to work with others. Bloom's Taxonomy (a standard text for teachers and instructional designers) is part of the canon of any instructional design course, and the meat of this taxonomy is in the "higher-order" thinking, or metacognition.

While retention and comprehension can be easily measured through computer-based assessment, application, analysis, synthesis, and evaluation are more difficult. Dissecting assumptions, defining motivations, and analyzing context are all processes that can be modeled and taught, both directly and experientially. While trained and clever assessment writers can carefully craft multiple-choice questions that approach these higher-order processes, it's likely that learners need to actively discuss and write, as well as apply knowledge to creative tasks and projects that further hone these procedural skills.

Yet "critical thinking" and other models of thinking and doing are not mysterious schemas that can only be transferred in the context of the classroom. First, students can learn meta-content from collaborating with and receiving feedback from their peers. They can also access the world's best thinkers and doers through video. Organizations like TED and the Aspen Institute offer some of the first "viral content" on the Internet amongst the educated. New "start-up schools" like Altius Education, Fidelis College, and University Now all are approaching meta-content through various rubrics and evaluation techniques, and like most start-ups, are

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trying to identify ways to do so in a scalable fashion with technology and workflow innovation. However, assessing and providing qualitative feedback on such models of thinking and doing will remain difficult for the foreseeable future.

Higher education should quickly embrace this trend by using examples of work by the world's best experts, allowing the Internet to have a larger voice in providing demonstrations of thinking and doing. Instructors can then move to focus on their direct relationships with the students, become coaches through more thoughtful quantitative and qualitative feedback, like rubrics and evaluations, that lead to student mastery.

8. Mentorship, Coaching, Apprenticeship, and Supervision

Despite some efforts, difficult to replace. Should be an area of focus and defensibility.

While the Internet has proven useful at both helping people stay connected with people they already know and connecting people with opportunities (applicants to employers, single people to potential matches, etc), the authentic asymmetrical relationships (mentorships, apprenticeships) created amongst peers, faculty, staff, and alumni will likely prove more difficult to recreate. While those striving to move up in the world have a high motivation to find mentors, in general, potential mentors have no drive or time to find and filter new young people to mentor. While not impossible, disintermediating mentorship may prove to be a substantial design challenge.

Mentorship can be divided up into two distinct services. The first is “identity modeling”—providing a model of what younger people aspire to be. Being a role model, explaining how previous experiences played out as various choices were made, are tangible

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stories for learners to execute. The second is “life-coaching.” Life-coaching involves consistent check-ins, and recurring exploratory conversations.

The idea of mentorship in higher education also usually connotes some kind of expertise transfer from a subject matter expert. Yet now there are services like Cramster and Quora where you can pay additional money or credits to ask a subject matter expert to answer specific questions. This kind of one-on-one subject matter help is even being unbundled by bundled providers. Southern New Hampshire University unbundles the role of faculty for their competency-based online program through a subject matter expert that can intervene or help out on request. There's a “learning guide” which helps to set up pathways through content and coach on motivations and strategy. University Now and Altius Education separate the grader from the instructor. InsideTrack provides “success coaching” to students going to school and has demonstrated improved retention outcomes.

There are also service providers that are providing access to mentorship and apprenticeship to learners whether or not they are attending college. Enternships and Enstitute are two organizations dedicated to facilitating these types of experiences within the entrepreneurial community. Enstitute even posits that having “apprenticeships” with respected entrepreneurs is superior to going to college in many respects, and much of their marketing communicates that this is a free (if not paid) replacement to postsecondary education.

While many students think of a residential college experience as a newfound freedom, part of the value proposition to the parent is providing their children with a supervised coming of age. The consensus among parents seems to be that 18-year-olds are not ready for the real world, they need some sort of supervised staging ground equipped with mentorship, coaching, apprenticeship, and supervision.

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Because the mentorship function of higher education will be difficult to disrupt, traditional higher education should focus on this as a source of comparative advantage and invest more heavily in facilitating and providing mentorships with existing faculty and staff, as well as community members and alumni. Moreover, students need to be coached in how to extract value from these mentorships. Within the shared environment of academia, the “pay it forward” value of helping, coaching, and advising is more immediately apparent.

9. Performance Feedback leading to Mastery

Basic knowledge comprehension easily replaced, complex skills assessments nearly impossible. Extreme opportunity for institutions to refocus and own.

Despite the worst habits of lecture-based courses, an enormous value of much coursework is the process of getting extensive qualitative feedback on the performance of complex skills. Part of the mythology of getting an undergraduate degree is a strenuous senior seminar or capstone project. In graduate school, there's the dissertation board. An ideal college experience is imagined as being pushed and evaluated against impossibly high standards by sages in robes.

While feedback on simple math or code problems is relatively easy to do at scale, feedback on speech, presentation, writing, and communication are markedly difficult to automate or scale. Again, it does not mean it cannot be done; recently Tom Vander Ark, formerly of the Gates Foundation but now a Partner at Learn Capital, opened a competition to create an essay grading algorithm that would outperform the average professional grader. The winning algorithm outperformed all but grader.²⁰ While it's easy to imagine assistive algorithms that increase the speed and output of grading, I believe it will prove more difficult to give complex

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performance feedback that provide insights into improving writing past a basic essay structure. But that's just writing, and there are infinite forms of media and output that learners may be asked to tackle. The more complex and human the task, the more qualitative the feedback needs to be, and the more important interpersonal communication becomes as part of the feedback cycle to approach mastery.

The easy-to-imagine shortcut here is peer-to-peer evaluation. Recall the earlier discussion of sites like Dribbble, where designers provide comments, follow people, and “love” certain works. These serve primarily as signals, but they are also a form of feedback to designers on what work resonates. Coursera and Udacity, the most visible of education startups, have both created ways for peers to evaluate one another's work at a scale and with an accuracy that seems to be equivalent to a grade given by subject matter experts.

The rise of Incubators in the entrepreneurial community is largely based on the Meta-Content and Skills bundle, and they provide very rigorous Performance Feedback Leading to Mastery. They have consistent check-ins where mentors apply high standards and detailed verbal feedback about the state of their business plan, product, progress to date, and all the other myriad concerns of starting a company. This is why even though the entrepreneurs give up around 5 percent of their new venture for almost no money, they find the exchange incredibly valuable and more than worth it.

Like mentorship, providing feedback on higher-order skills is an area of comparative advantage for traditional higher education. Institutions should embrace the fact that technology is getting better at delivering and assessing simpler content and skills, and focus more of their attention on the feedback leading to mastery.

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A Transformative Experience

10. A Rite of Passage

The Internet cannot replace, but other services may provide alternatives. Extreme opportunity for institutions to re-focus and own.

An unbundled education lacks much of the cultural and social experience surrounding the education itself and has no mechanism to trigger the increasing responsibilities and gradual maturity that are central to the college experience. Embedded in this supervised coming of age is a rite of passage.

Short of reviving Second Life, I have trouble understanding how the Internet replaces this. Currently, there are various internship sites, and it may be possible that through a series of well-designed travel experiences someone can compete with this aspect of the university.

Outward Bound serves as a rite of passage for many young adults. In cultures where military experience is near-mandatory, participation in military training and service also serves as a Rite of Passage. Low-budget travel can often create bonds within participants. If you've been hostelting in Spain, you're likely to immediately feel a connection with someone that's done the same. DevBootCamp has managed to be so rigorous that alumni feel bonded in special ways. Shereef Bishay, the founder of DevBootCamp, even claims that “everyone cries at least once” because the experience “pushes everyone to their limit.”

Higher education should focus on its core strength here. What helps students come of age? Events and curriculum that build character, provide opportunities for leadership, and force student to interact with different cultures and ideas.

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11. A Personal Platform: Career, Character, and Impact

The Internet cannot replace, but other services may provide alternatives. Extreme opportunity for institutions to re-focus and own.

When people want to get an education, particularly postgraduate professional degrees, they are looking to jumpstart a career, change careers from a previous path to a future path, or accelerate an existing career path and redefine the existing career ceiling to a higher one. This value proposition seems necessarily tied to some period of time to use as a *personal platform*. Society and the job market seem to understand and accept going to school as an appropriate time to retreat from the job market to focus on oneself and redefine a career trajectory.

It is difficult to imagine unstructured and unbranded blocks of time (in formal programs or not) legitimately replacing the personal platform value of higher education. The main barrier here, though, is the strength of the signal and credential. If entrants in the signaling or credentialing space, such as Degreed, Smarterer, or Entelo, were to demonstrate improved signals to the job market, the idea of using travel, retreats, or unstructured educational programs to spend the time block necessary to replicate a personal platform seems more possible.

A Career Platform is difficult to define and was nearly omitted in favor of the component parts already explored. It certainly contains prior value propositions of An Affiliate Network, A Signal of Achievement Motivation and Velocity, and A Credential of Estimated Competency. However, analysis of the marketing of degree-granting programs and their motivations cannot omit that there are a few additional services and experiences related to their career direction and trajectory that people are buying when they chose to purchase an educational program.

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12. A Culture of Personal Exploration

The Internet cannot replace, but other services may provide alternatives. Extreme opportunity for institutions to re-focus and own.

While parents evaluate the value of their child's credential in the job market and feel at ease that their children's coming of age is mediated by other adults, students beginning the residential college experience are looking for increased insight into their own identity and future, and are seeking a safe space to recreate themselves and grow as individuals among a new peer group.

An implicit value of higher education is the interaction with diverse types of people, from different cultures and subcultures. It is assumed that going through this experience with a diverse set of people that all work together to share their progress towards personal transformation creates a positive feedback loop. The externalities of people sharing their ideas, values, experiences, desires, motives, ambition, and trajectories creates a culture of personal transformation. Where else but college can you get information about different passions, hobbies, and career paths from the fliers on one elevator wall?

Things like study abroad, cultural events, student activities, and even partying are all laid out as a series of transformative experiences. This social and internal transformation may be impossible to achieve on the Internet, but it may be possible through alternative in-person programs. Unschool Adventures, a company run by the author of *Better than College*, runs travel programs targeted at those not going to college so they can use travel as the mode of personal exploration. The cultural acceptance of a "Gap Year" similarly emphasizes travel as a mode of personal exploration.

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Closing Comments

While everyone in higher education should feel the stiff, new competition, they have time to learn to compete. Online services do not put everyone out of business. Pundits and thinkers have long suggested that the Internet tends to “disintermediate” the end-user to the provider. For example, consumers can now buy online from online retailers and even straight from the producer, rather than going to retail stores. This has not been the “end of retail” as some have hypothesized; indeed, most of the famous retailers we knew of fifteen years ago are still performing companies even with a mature online retail industry. Physical retail stores have competed and held market share by moving towards unified consumer experiences and quality control regarding fit, look, returns, and overall identity and loyalty. Similarly, in-person education will adapt and find it’s positioning in the focused but total experience they provide learners.

Yet, unbundled services on the Internet promise to put downward pressure on costs. First, if a consumer can assemble the entire value at a reduced cost, this creates a price ceiling of competition for the whole industry. While this will turn out to hold true, how and when it will play out is unknown. Second and more importantly, if institutions that currently manage the entire bundle can start to allow technology to work its magic and see themselves as providers atop of whatever can be conveniently and cheaply accessed online, institutions will be able to focus on the quality of those services best left to in-person environments at lower cost. Whether they pass that lower cost onto students is another issue entirely.

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