Academia Next

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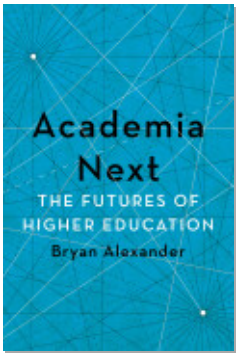

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Trends

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1 Objects in Mirror May Be Closer Than They Appear

This book relies primarily on two forecasting methods, trend analysis and scenario creation. Its intention is to combine their respective strengths in order to generate the richest and most useful map of higher education's future. Their limitations are widely understood, and I will address them. Before discussing these two approaches, I raise several other methodological and popular assumptions concerning forecasting.

Thinking seriously about the future can raise a great deal of skepticism, much of which is warranted. It is both easy and often entertaining to find examples of predictions that failed to pan out. Science fiction has imagined futures in many ways, often portraying futures that could be generously characterized as alternative histories. Popular futurists have proclaimed things to come in serious tones, rarely admitting their errors when the future becomes the present. Even sober forecasters can be sideswiped by reality, as when many predicted a presidential victory for Hillary Clinton in 2016.

Yet these misprisions and inaccurate visions should not encourage us to entirely set aside futures thinking. Obviously, we need to think carefully about the future in order to plan anything, from individual actions to the grand strategies of complex organizations. But beyond that we can recognize the sustained hard work of the professional futuring world. This work usually dates to the middle of the twentieth century, when Cold War think tanks and strategists started developing new ways to forecast geopolitical events, especially in terms

of nuclear war. One group of practitioners in the 1960s and 1970s designed and iterated a scenarios method to help businesses and governments think through multiple futures. At roughly the same time the Club of Rome used emerging computer technology to forecast ecological and demographic trends; their work was enormously influential, helping to spark cultural and policy changes worldwide.

Over the following years the futures profession grew and developed. It took root in academia, with major departments at the Universities of Houston and Hawaii. Professional organizations matured. Schools of practice became well established, and methods were extensively documented. Businesses hired futurists as full-time employees or as consultants. This world is often overshadowed by pop futurism of various kinds, but its inhabitants continue their careful work nonetheless. They avoid the term *prediction* and instead help clients explore multiple possible futures. They sometimes prefer the term *forecast* to *future*, with its meteorological resonance. It is from that professional world that this book draws its methods.

A more subtle challenge to thoughtful futures work stems from a widespread belief in how the future works. A popular way to imagine the future is of a massively transformed society, thoroughly reconfigured by technology in particular, shot through by changes to human norms and daily life's minutiae. The *Jetsons* animated television series (1962–63) famously offers a paradigmatic example of this futuring mode, with family life, home spaces, and work all strongly remixed by imagined technologies, as does, its own way, the contemporary *Star Trek* TV series (1966–69). The film *Tomorrowland* (2015) updates this approach with a didactic edge, explicitly calling on the audience to strive for such a rebooted world and criticizing those who see futures in other terms.

Yet if in thinking through the problem of the future we start by looking backward rather than forward, we find that the reality of historical transformation offers a more complex and uneven model of changes, technological and otherwise. Starting in the early modern period, we see new developments implemented alongside the persis-

tence of traditional forms. Inventions contemporaries deem shocking end up adopted, yet those inventions may fail to eradicate many long-standing practices. World War I introduced mechanized transport at scale (trucks, automobiles, and aircraft, in addition to expanding the role of trains), even while horses and donkeys remained widely used. For a less catastrophic example, California has for two generations hosted the digital world's epicenter in Silicon Valley while also maintaining extractive industries, such as oil production, dating back to the early twentieth century and growing its agriculture sector. Part of California's water politics is explained by competition between these different historical strata, with agriculture demanding water to feed crops, industry requiring water for cooling machinery, and the wealthy installing water-wasting pools and fountains to indicate class status.

Similarly, some consumers today obtain news via Twitter or mobile phone apps, while others rely on journalism from television, radio, and even newspapers. Although new digital communication technologies emerge frequently, email—which dates to the 1960s—remains widely used, relied upon, and generally unremarked upon.[1] Self-driving cars are a popular theme at present, as they should be, yet the full panoply of human-piloted automobiles remain in use, even to the point of people living nomadic existences in them, building up communities, careers, and folkways.[2]

In general the future never wholly eradicates the past. Instead, the two intertwine and influence each other, coexisting and becoming adopted by different segments within a population. Understanding this dynamic offers a more accurate and productive way of approaching forecasting. David Edgerton refers to this this shift in our awareness, from seeing the future in terms of *The Jetsons* to a more accurate past-present coexistence, as the "shock of the old."[3] Metaphorically, I think of this as imbrication, the process by which new rocks or tiles are laid unevenly upon old ones. The newcomers partially obscure their predecessors (as when the future replaces the past), while at the same time partially revealing them (older practices persisting into the future).

The exploration in this book follows this mixed view. We look to not only what new developments emerge and transform higher education, but also to what will persist from our present and our past.

Trend Identification and Tracking

Trend analysis identifies major drivers of change from recent history and current events. We can isolate trends from background noise by outlining coherent and persistent activity that seems likely to alter the surrounding situation.

Identifying trends often benefits from environmental scanning practice, which is the continuous examination of current developments for new or repeated "signals" of change.[4] Within this practice it is vital to scan sources diverse in terms of stance (political, ideological, and so on), geographical location, content focus, demographics, and more. Conducted over time, environmental scanning can discern "signal strength," or a higher incidence of a certain trend, suggesting its rising importance. The greater the breadth of scanning, the better the chance of reducing bias. The longer the run of a scan, the better opportunity of detecting more developments, as well as the chance to track them over time. The Online Computer Library Center environmental scans of 2003 and 2010 offer a good example of this for the library world.[5]

To a degree, trend analysis can be considered a subjective process, more of an art than a science. This can lead to problems of bias, in that we may look for trends that we presuppose are significant, or to research in sources we find congenial. We can also avoid developments that we perceive as threatening our interests in some way. Conducting more objective analysis requires the use of checks and guidelines. Consulting experts, for example, can add validity and context to a given trend attempt. Using peer review or social media feedback can also limit subjective biases.

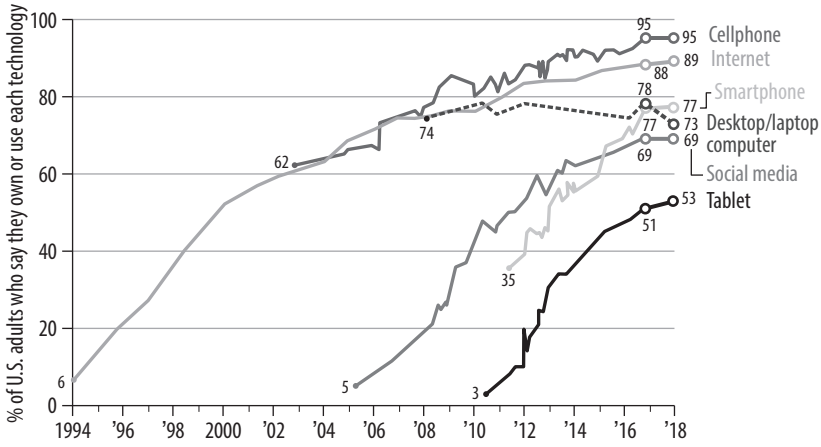
A greater challenge to trends analysis stems from its best application. Many forecasters and other practitioners use trends because of their tangibility and utility. Research into historical and present data

lets us ground trends in reality rather than building up futures through speculation. Research accumulated over time adds longitudinal data to a trend model, giving us insight into its strength (Is evidence for this driver increasing or decreasing?) and allowing quick extrapolation into the future. We can readily test trends against reality and check their veracity as well as their short-term impact.

That extrapolation offers the greatest utility. We can project a trend forward on the basis of its present and past presence. Decreasing sales of personal computers over the past decade, for example, can indicate an upcoming continued shrinkage in favor of other devices that perform some similar functions (tablets, e-readers, smartphones). Rising numbers for smartphone usage add to a forecast of an even more mobile-first world than we currently experience. Increasing economic inequality, measured by both income and wealth, could lead to a new gilded age. Persistent trends, such as the popularity of learning management systems among campuses, point to a future where they simply continue. Mary Meeker's Internet trends analyses are an example of such work, especially when well supported by research.[6]

But a quick reflection about extrapolation failures reveals the limitations of trends. Reality rarely follows straight-line projections. We can extend a rising trend line into the future by looking at clear metrics from recent history. For example, assume a given trend indicator stood at 8 in 2010 and 12 in 2015. We could therefore expect it to read 16 in 2020, but trends do not always proceed in a simple, linear fashion. They can accelerate (75 in 2020!), plateau (12 again), or reverse (back down to 8). A projection that American higher education enrollment would continue to grow because of steady growth in the 1990s would have been useful for the 2000s, but it failed to capture enrollment's downward break starting in 2012. Booming adoption of many leading devices for years or decades reached a plateau by 2016.[7]

There are striking limits to this trend extrapolation in the technology world. We are used to sudden and rapid change when it comes to digital devices and software, as when social media use went from



The share of Americans using various technologies has stayed relatively flat since 2016. *Source*: Pew Research Center survey conducted January 3–10, 2018. Trend data are from previous Pew Research Center surveys. Data on Internet use based on pooled analysis of all surveys conducted each year.

few to most American households in a decade.[8] Yet some technologies took many years, even decades, to make a splash. Podcasts appeared in the early twenty-first century, first named in 2004, but didn't achieve major audience and economic growth until a decade later, with the sudden popularity of *Serial* in 2014.[9] The first e-books date back to the early 1970s, as with Project Gutenberg's launch in 1971, more than two decades before Sir Tim Berners-Lee launched the World Wide Web, but e-books really didn't seize the public imagination or the consumer's wallet until Amazon launched the Kindle in 2007.[10] Even the famously fast digital world can experience slow developmental curves. To correct for extrapolation's capacity to err, we need other contexts and information to give our extrapolation line a better mapping onto reality. The following chapters attempt to supply such correctives.

More dramatically, trend identification fails to give us insight into "black swan events." Nassim Nicholas Taleb coined the term in 2007 to describe occurrences that are, statistically, extremely unlikely but

have enormous effects when they do occur. Recent black swans include the 2008 financial crash (recall how many analysts deemed the economy healthy at the time), the collapse of the Soviet Union, and the September 11 attacks. We can reach further back in time to find other instances, such as the shocking eruption of the First World War or the appearance of nearly every new religion. Black swans are, by definition, difficult to anticipate. In contrast, trends are often concerned with statistically likely events, rather than unlikely ones. This book touches on black swan possibilities for higher education, but not at length; they deserve treatment on their own beyond the scope of the present volume.[11]

Trend analysis is also dependent on the quality of research. The ancient cybernetic principle of garbage in, garbage out applies. One can easily fall prey to overdependence on certain sources, confirmation bias, and the excitement of change (or hype). To counter these challenges, I have conducted research with certain safeguards, starting with relying on the futures profession and futures scholarship to hone my practice. Further, I have published this research openly—shared through multiple presentations, articles, social media discussion, and a monthly trends report—all with the purpose of garnering feedback and obtaining reality checks from outside observers.[12] I have sought heterogeneous, skeptical, and openly critical audiences to push back on my research, as well as to bring attention to accounts and developments I might have otherwise missed. In short, I have conducted a distributed, continuous, and open research agenda. The following trends-focused chapters are the results.

Bearing these caveats in mind, we can recognize several established uses for trend analysis, starting with pedagogical benefits. The practice of examining multiple and diverse sources is a fine way to get out of one's personal or political bubble. Tracking trends across domains allows for interdisciplinary learning. It is difficult to resist making links between disciplines or other categories after considering trends, since so many developments engage with more than one. For example, we may consider the release of a large and open data set of

biological information as a good instance of the rise of big data in research. That can also be viewed as an instance of open education and open access in scholarly publication. One could search for additional examples in other fields, looking for patterns that indicate new trend lines. 3D printing now involves robotics, copyright, open source, and virtual reality. Trends intertwine.

In the chapters that follow I identify a series of trends. Each one is introduced in terms of recent history, a series of examples, and a quick extrapolative sketch for suggesting ways a given trend could play out over the next two decades. In addition, many trends appear in the company of countervailing trends. These are developments closely related to a trend but that work to weaken it. For example, one trend involves the rise of blockchain technology; a countervailing trend is the chaos surrounding bitcoin value and storage security.

Scenarios

In contrast to trends, a scenario is a work of fiction, a story told about one possible future. Generally, we create scenarios by starting with some part of the present, such as a geographical area or organizational type, then imagine how it would change under the impact of one or several trends. That part of the present can be as small as a single enterprise or as large as human civilization.

Formally, we can situate scenarios within the genre of science fiction, as they seek to envision different worlds, yet without the changes to reality's ground rules seen in fantasy. Scenarios are more qualitative than trends analysis, more speculative and ultimately subjective. They are narratives, clearly more art than science.

What, then, is the utility of scenarios? To begin with, because humans are narrative creatures, stories of the future can be powerful tools for helping us visualize different worlds. As Daniel Pink puts it, "Our tendency to see and explain the world in common narratives is so deeply ingrained that we often don't notice it—even when we've written the words ourselves."[13] The act of consuming a sce-

The Higher Education Crisis		
Student debt Campus mergers and closures Graduate school shrinkage Partisan and bipartisan political pressure		
Education and Contexts	**Education and Technology**	**Technology**
International education Racial inequality Sexual assault Athletics K–12 and higher education Macroeconomic indicators Library changes Alternative degrees Shared academic services Remedial classes Challenges to internships Adjunctification Green sustainability Demographics Executive compensation Enrollment changes Alternative certification Intergenerational tension Responses to Trump	The LMS world More MOOCs and online learning Gaming in education Badges Flipped classroom/blended learning Educational entrepreneurship Open education possibilities Crowdsourcing in academia Digital humanities develops Faculty criticizing deployment of technology Big data and data analytics	Internet of things New forms of creativity Digitization Augmented reality Limits of the Web Cloud computing Moore's Law Open source Office versus Web office Shopping online Copyright battles New interfaces Fragmented Internet Onshoring hardware
	Automation in education Blockchain in education Campus digital threats Crowdfunding in academia E-books in higher education Mobile devices in education Social media in education 3D printing in curricula Video and education Virtual reality in education	Automation's promise Blockchain Digital security threats Crowdfunding E-books Device ecosystem Social media 3D printing Digital video Virtual reality
	Maker movement Shared academics Rise of the net.generation	

Map of trends tracked by Future Trends in Technology and Education. Much design credit to Joanna Richardson and Ed Webb

nario (see the following paragraph for details) gives us a window into possibilities. That window can be personal, as we try to see how our work, our families, and our selves could change under the impact of certain transformative forces. The vision can also be social, as we think through how organizations of various types would respond to and be altered by the effects of a change agent. The latter purpose is one of the more commonly seen scenario uses, harking to how Shell Oil deployed scenarios of possible petroleum industry outcomes under the impact of geopolitics, starting in the 1960s. That social sense can include conflicting elements of a culture divide or opposed sides of a political issue. Scenarios offer a useful way for those contestants to interact creatively in a safe and supportive environment, as with the 1991–92 Mont Fleur Scenarios, which helped South Africa move past apartheid.[14]

I find it especially useful to consider scenarios as pedagogical objects. Simply put, they teach us to think in new ways. That function is performed when we read (or create) scenarios and imagine ourselves within their setting and story. The reader (or viewer, listener, player) imagines what it would be like to live in such a world. How would their professional work change? What would be different about their personal lives? Beyond the personally immediate frame, we ask ourselves broader questions. How would our government change? Our employer? Our religion? Our economy? Our ecosystem?

Anyone concerned with higher education's future can imagine how a given college or university would change. This might be the institution where you are a student, trustee, professor, or administrator. Imagine how your role would shift under the impact of certain changed times. It could be an imagined institution you are studying for strategic purposes, thinking about how a competitor may change over time, or seeking to analyze how best to change up a state system's offerings. You may wish to work through the ways each scenario addresses different types of college and university, comparing how a given future affects community colleges versus research universities, or state universities against liberal arts colleges.

For example, imagine a future academy after a major pandemic has struck the world, perhaps along the lines of the early twentieth century's Great Influenza. To envision the institution under such pressure, we would have to think through multiple disciplines and domains. We would have to consider, first, how such a thing would occur. This could involve delving into the history of disease, a look into graph theory for models of contagion, and a reflection on contemporary public health. We would then apply that learning to colleges and universities, a process that can ramify extensively depending on our awareness of the sector. Would distance learning grow rapidly as people fear face-to-face learning because of perceived contagion risk? Similarly, how would we take conferences and other forms of professional development online? Depending on the disease's death toll, should we plan on depressed demographics within a generation, or would the birth rate bounce back? Would athletes refrain from practice and play from fear of contagion, or would both institutions and the general public demand more college sports as an inspirational sign of bodily vigor in the context of sickness and death? Which academic disciplines would be most likely to grow in the disease's wake? And so on. This mental exercise dives into disciplines and then crosses between them in an example of inquiry-based learning.[15]

As is often the case with pedagogical materials, creating scenarios can be at least as powerful as consuming them. Creators must consider all of the above questions and then anticipate how a given audience would respond, setting up a communication or rhetorical problem. The creators must establish a plausible story line (How might a pandemic evade the World Health Organization and the many effective defenses mounted by contemporary medicine?), fusing multiple disciplinary learnings with narrative generation. The process can be both daunting and exhilarating, as I have found in leading many scenario workshops, as well as in building my own narratives.

The forecasting field offers many established scenario practices, starting with templates for scenario creation. As mentioned above, the simplest method is to select one trend and consider how it might

become powerful enough to noticeably reshape the domain under consideration. A more challenging approach is to build a scenario quartet. This begins by selecting two trends whose outcomes are especially uncertain or unstable, such as a given nation's stock market growth, or possible ways general artificial intelligence (AI) could play out. The scenario creator then identifies two extreme outcome positions for each. In this example, we could envision a stock market that booms to historic levels and, in extreme opposition, a market that collapses into depression. Similarly, we could reasonably imagine an AI powerful and friendly enough to manage a city into a splendid period, as well as AI that results in a horrific dystopia. Each of those trend extensions can shape a scenario on its own, but what's more productive and interesting is to create four worlds based on the combination of each.

1. A boom market with utopian AI
2. A boom market with dystopian AI
3. A collapsed market with dystopian AI
4. A collapsed market with utopian AI

These worlds can be visualized as quadrants:

Scenario 1	Market booming	**Scenario 2**
AI utopia		AI dystopia
Scenario 4	Market collapsing	**Scenario 3**

The creators of a quartet then develop each scenario's distinct features. They imagine what kind of changes would occur when a given trend pair confronts the domain in question. For example, if the domain was book publishing, we might create scenario 1, where publishing firms are booming thanks to growing demand from a wealth-

ier audience and rising investment from expanding financial houses. Good urban planning from benevolent AIs has led to higher levels of educational attainment, which also grow publishers. In contrast, scenario 3 sees presses shrinking or closing because of economic insecurity, declining investment, and resulting political instability. Malevolent AI implementations worsen things by instilling distrust in digital content, depressing e-book sales.

A scenario quartet's creator or creators then further develop each scenario by comparing details across the quadrant, especially looking for different elements as they address topics otherwise untouched. In our example, scenario 3 includes e-books, and scenario 1 does not. Our author or authoring team can now imagine what happens to that publication form under different conditions.

Note that in creating such a quartet we are led to trends marked by instability, rather than more predictable and stable trends. This four-scenario approach is well suited to exploring change drivers that are difficult to grasp. We can also present scenarios that offer a range of tones. A common strategy is to offer groups that are individually distinct: optimistic, even utopian; pessimistic, perhaps dystopian; one especially different from today, representing a strange future with radical breaks from the present; a fourth much closer to the present, emphasizing continuities and incremental change. The variety can engage a diverse audience through their inclinations and mental states, leading to interesting conversations. Each tone connects with a different predisposition.

There are many formal ways to connect audiences to scenarios. A classic method invites a group to imagine themselves inhabiting a scenario's world through role-play, often with the assistance of a questionnaire or question template. Participants envision playing various roles (professional, parent, citizen, etc.) by understanding how those future roles and their contexts would differ from today's. Alternatively, and more simply, a scenario exercise invites people to imagine themselves in that future, either in their current professional role or in

some dimension of their personal lives (as parents, members of a given community, fans of a certain musical style, etc.). They can be invited to present their experience to the rest of the group from that future perspective, or to engage in introductory planning based on those changes.

Another approach is more subversive. This one focuses on a profession or domain's official sense of its own future, based on public statements. The exercise begins by acknowledging and fairly representing that view through its presentation in the form of one scenario, then by adding to and complementing it with alternative scenarios. First, this process can empower a group to consider the fact that their organization or field has an official vision of the future and what that entails for planning, work, culture, and more. Second, the population can now openly consider alternative forecasts and possibilities, and then take a critical stance toward the prior consensus. As two of the foundational Shell Oil scenario developers reflected on their work decades later, "Scenarios facilitated dialogue in which managers' assumptions could safely be revealed and challenged. They enabled consideration of unexpected developments—such as the chairman's sustainability agenda in the 1980s—and inconvenient truths, such as OPEC's power over oil prices in the 1970s. They encouraged strategic conversations that went beyond the incremental, comfortable, and familiar progression customary in a consensus culture."[16] Naturally this approach can be challenging in terms of local and institutional politics, and must be conducted with tact and care. Some form of discussant anonymity, such as that found in Chatham House rules, under which ideas and statements can be reported on without identifying individuals speakers, is often advisable.

I find another approach especially useful. After introducing a group to a set of scenarios, I invite them to share the one they deem most likely to transpire, and then to offer their reasons for that assessment. (This is an area where technology can augment a face-to-face session. A digital poll using smartphones or personal response devices can elicit answers from the entire group, rather than the relative few who feel comfortable speaking.) After that discussion I ask the question

again, but with a twist: which scenario would they *prefer* to occur? The answers can, unsurprisingly, differ, and then lead to a discussion of the group's role in shaping the future. This returns agency to the audience, an important step to take because many people tend to view the future passively, as something that will be done to them, in which they play no active part. Brainstorming and planning for next steps, such as a gap analysis, naturally follow. Scenarios in general tend to be good at getting people talking, as we are narrative creatures, trained by a lifetime of experience in responding to stories.

In the chapters that follow we will explore both scenarios and trends. All are grounded in the present day, using evidence of current developments as springboards for envisioning the future of American higher education.

* * *

One final note: as mentioned in the introduction, please read what follows with a sense of openness and possibility. These trends and scenarios, backed with evidence, may give you a feeling of inevitability. They are, after all, expressions of powerful forces in the real world. Yet do not lose your sense of agency. If you are a student, trustee, security guard, or provost, you have the ability to make some impact on what becomes of American higher education. Karl Marx famously observed (with the nineteenth century's typical sexism) that "Men make their own history, but they do not make it as they please; they do not make it under self-selected circumstances, but under circumstances existing already, given and transmitted from the past." These trends and scenarios represent those circumstances; what you make from them is in your hands.