

# Why Teach the Future?

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*We should teach as much about the future as do we do about the past.*

## Introduction

Subjects taught in school change with the times. Educated Romans learned Latin at home, but learning Greek as a second language enabled them to read the philosophy and science of their day. The medieval university taught seven subjects – the trivium (grammar, logic and rhetoric) and the quadrivium (arithmetic, geometry, music and astronomy) as foundations for the advanced study of philosophy and theology. Physical science entered the curriculum in the 17<sup>th</sup> and 18<sup>th</sup> centuries; biology followed in the 19<sup>th</sup> and social science in the 20<sup>th</sup>. Penmanship was an important subject for a long time, but now students learn keyboarding and computer literacy. Ideally, the curriculum prepares students for participation in the world they will join as adults.

## 21<sup>st</sup> Century Realities

In 1970, Alvin Toffler said that this generation would be the first to routinely live in its own future, what he called "future shock," unlike previous generations who were born into a world much like the one they would die in. That is not to say some previous generations did not suffer the collapse of their world, but those were rare and unexpected cataclysms. In general, socialization and education for that time was well suited to a world of little change. Not so, however, for generations forced to live in their own future. Although change has been ubiquitous throughout human history, its pace today is unprecedented. So we do this generation no favors when we use the traditional script to prepare them for the future.

Let's take stock of our world. The most important driver of change today is the speed by which information moves around the world. Email versus letters, web pages versus catalogs, online versus shopping malls, EFT versus checks, MP3s versus LPs, camcorders versus film – the digital revolution has put the ability to create and transmit information into the hands of more people at greater

distances than ever before. IDC, a global provider of market intelligence, reported in 2008 that the number of "atoms" in the digital universe is expected to expand by a factor of 10 every five years. What new skills will be required to sift, organize and make sense of this information load by 2025?

Accessibility to the growing universe of information is fueling the pace of technological change. Punya Mishra, associate professor at Michigan State University, estimated that in 2008 information traveled at approximately 200,000 mph compared to 1.4 mph in 1798 (Mishra, 2009). As information changes hands and remixes, new knowledge is created. Innovation occurs. New opportunities emerge as do new threats. Already advances in genetic engineering and AI are changing what it means to be human. Will the next generation be ready to intelligibly discuss issues such as a mandatory limit on the life span, laws against genetic discrimination, the redefinition of parenting and laws on cloning?

Globalization, the open-source movement and proliferation of high power miniaturized digital surveillance devices, are both a source of opportunity and danger. Will the end of globalization be the commoditization of everything sold to the highest bidder, including what has traditionally been called the commons, such as freshwater, the genetic germline, or the atmosphere? Is open access to "recipes" for the production of unconventional weaponry a greater threat to the survival of mankind than closed-fisted proprietary rights? When surveillance is omnipresent, where does private right end and public good begin? Technology is far from neutral. Are we training the next generation to responsibly handle the hard decisions and the complex issues and demands of a future they will live in?

Are we preparing students for that reality? Schools today are hardly different than those of a hundred years ago. Perhaps, a few more computers, a CD or two, but at its core the structure and process of education remains the factory model geared to the top-down transmission of the knowledge accumulated over previous generations.

Given the unprecedented rate of social change, the exponential growth of the digital universe, the proliferation of new technologies, how useful is yesterday's knowledge to a generation that will routinely live in its own future? To cope with change we need to understand change and to think systematically about anticipating and managing change and its implications on the unfolding future.

## Teaching the Future

What should we teach students about change? To teach the future begins by helping students identify and classify change by source, level, horizon and rate.

- Change *is* the future. The future is born from change.
- Change (and the future) comes from two **sources**.
- Change from the world is inbound. We have little or no control over it.
- Change we ourselves create is outbound attempts to influence the world toward a more preferable future.
- The future is *always* some combination of both sources.
- As a result, we are neither hapless victims of change nor omnipotent dictators of the future.

- Change is manifest at three **levels**; the enterprise (individual, organization and community), our immediate transactional environment (the environment we deal with on a regular basis), and the global environment (the world, broadly speaking).
- Change experienced by individuals, our organizations and communities is ubiquitous, small scale and evolutionary.
- Change emanating from our immediate environment is generally familiar. We are regularly in touch with our family, friends, and co-workers. Organizations and communities maintain constant contact with customers, suppliers, competitors and regulators.
- The global environment is the black box of change, often ignored because of distance from the center or because of poor understanding. Unfortunately, the global environment is increasingly the driver of change in our immediate environment. Globally induced change is profound, large scale, revolutionary and long-term. Getting some advanced warning at this level would be a welcome thing.
- Change occurs in three timeframes, called time **horizons**—short, medium and long-term.
- Short-term change (often called tactical) is what we deal with everyday. The time horizon is on the order of hours, days and, perhaps, a few weeks. Going to the grocery store, ordering plane tickets for a vacation and fixing the plumbing are all short-term changes.
- Medium-term change (also called operational) takes longer since it involves change in the processes that we use. The time horizon is on the order of several months to a few years. Getting a new car or changing jobs are medium-term changes. For a company, adopting a new computer system or birthing a new product are medium-term changes.
- Long-term change (also called strategic) takes the longest. The time horizon requires several years. Paralleling the global environment, long-term strategic change rarely enters our day-to-day thought.
- Change occurs at different **rates**; continuous/ incremental change to discontinuous/ disruptive change.
- Continuous change as evidenced by trends extending over relatively long time periods allows sufficient time for steady adaptation.
- Not so with discontinuous change. It comes abruptly, often unexpectedly. We are surprised; we are not prepared and, therefore, we are at risk. No one likes to be surprised by discontinuous change.

### Anticipating Change

To teach the future means helping students develop a wider-deeper-longer perspective.

- **Wider:** Rather than relying exclusively on the radar screen, pilots and lookouts on ships continually scan the horizon widely for unexpected signs of change. The military calls it situational awareness—paying attention to what's going on

around you. Even though the effects of long-term change may not be felt for sometime, it is prudent to be fully cognizant of what is coming. We recommend scanning at the level of the global environment on a regular continuous basis, "banking" all alerts on inbound change.

- **Deeper:** Looking more deeply means looking beyond the obvious, diving for the sources, mechanisms and drivers of change. Looking more deeply means investigating relationships among multiple variables operating simultaneously. Knowing source and interrelationships will facilitate a better understanding of how change may play out in the future. Every explanation of what is happening or what could happen is built upon a foundation of assumptions. To better anticipate the consequences of change, including unexpected consequences, students must learn how-to unearth connections and challenge core assumptions.
- **Longer:** Our problem-solving skill is like our diet—fast, instant and to-go. And the results testify to the consequences of mixing complex problems with short-term thinking. A perfect recipe for disaster! Teaching students how to take the long view is a necessity for anticipating change.

### Managing Uncertainty

Looking more widely, more deeply, and longer into the future are informal ways of anticipating the future. The formal method for anticipating the future is forecasting—that is, describing future conditions. Business forecasters make predictions, telling clients what they think will happen in the future. Unfortunately, most get it wrong. The future is unpredictable, we know that. Then why do it? One reason is that many believe tomorrow will look very much like today, only bigger and better. Extrapolation is the natural fit in a world enamored with science.

Predictions in the physical sciences such as astronomy, physics and chemistry have done very well. Then why are predictions about the economy, or the outcome of elections, or the success of new technologies so often incorrect? The reason is that most human and some physical systems have attributes that make prediction impossible.

- **Chaos** is the state of a system that is hyper-sensitive to initial conditions making prediction in the medium and long-term future impossible. The weather is such a system, and we suspect that many human systems, like markets, are that way, too.
- **Criticality** is the state of a system in which discontinuous change becomes ever more likely. Snow hanging over a mountain, dissatisfaction with a political regime, exponential growth in a market—all have an increasing potential to experience discontinuous collapse, but how and when that collapse occurs is unknown.
- **Complexity** in systems creates the potential for the emergence of completely new patterns of behavior. As with chaos and criticality, emergent behavior is inherently unpredictable.
- **Choice** is exercised by agents in most human systems. Making choices influ-

ence future outcomes. Our ability to predict choice in the aggregate is minimal, making prediction of the future inherently difficult.

The presence of one or more of these attributes in a human system diminishes the chances that a prediction of future outcome will be successful. So what are we to do? Simply sit and wait for the future to happen? Of course not. That would be imprudent. It would leave us openly exposed, completely unprepared for the future.

Learning to deal with the future requires learning how-to manage uncertainty. Up until now, the process of education has relied heavily on the top-down transmission of the accumulated knowledge. A process centered on the assumption of one answer to every question, one solution to every problem, and one explanation to every situation. Learning is said to occur when students can reproduce the right answer, the correct sequence, or exhibit near perfect emulation. Some dedicated courses, such as those for the gifted and talented, encourage creativity; a few even permit imagination. In the main, however, a right answer is the pre-determined outcome; the student's only job is to "discover" it. Students who insist that "There is no answer" or that "There are many answers" are perceived as impertinent even though they may be correct.

Unfortunately, the exponential pace of change has created a world in which the chance of discovering the right answer in the storehouse of accumulated knowledge is vanishingly small—more the exception than the rule. Therefore, adapting to a changing stock of knowledge and tolerating the consequent ambiguities are required skills for the 21<sup>st</sup> learner. Admitting that we do not know the answer and then supportively challenging students to offer solutions are ways of stepping away from the transmission model of education and preparing this generation to routinely live in its own future.

So how do we manage uncertainty? How do we overcome the inherent unpredictability of the future while still preparing for it? The answer lies in distinguishing predictions from forecasts. Predictions are descriptions of a single future—what *will* happen; forecasts are descriptions of multiple, alternative futures—what *could* happen. These descriptions are called scenarios, literally stories about how the future could unfold. Granted scenarios may not be as satisfying as a clear prediction of what will happen, but how satisfying is it when most predictions turn out to be wrong?

Scenarios are not just multiple predictions like betting on six of seven horses at the race track hoping one of them will win. Scenarios are ways of exercising our foresight capabilities. Rather than being bound by the expected future, the one that will occur if nothing surprising occurs, we examine a range of plausible scenarios to prepare for more than just one outcome. In the process, we examine the assumptions that are required by the expected future. We consider how each assumption might turn out differently than we expected. We use our imaginations to consider events that could disrupt the expected future and the implications of that future that might surprise us. Developing scenarios encompasses the recommended practices of looking widely for many forces of change, looking deeply into our beliefs about how change can and should occur and looking over a longer time period to be sure that we understand how things could turn out. Most importantly, scenario forecasting takes our uncertainty about the future seriously and embeds that uncertainty in plausible stories so that we can prepare for a whole range of futures, not just the expected one. Scenario forecasting should be an important part of every school's curriculum.

## Creating Change

The final step in teaching the future entails learning how to create change, maneuvering toward the best possible future by choice. Creating change is hard; it's messy; there's no instruction manual that makes it routine. Nevertheless, applying a few principles will improve the experience and the success rate.

- **Rationale:** Creating change is serious business. It is harder to do than most people realize, and its consequences are not always as expected. So the first principle is to enter into the process of creating change when there is good reason to do so, but not before. Look before you leap because the water may not be as welcoming as it appears. We recommend two places to look for the *case for change*—the world and ourselves, the same sources of change described above.
  - The first reason is that world *requires* us to change, sooner or later. Time is running out, and waiting too long means that we lose all ability to create the change we want.
  - The second reason is that we aspire to do great things, and no great thing happens by itself. It always requires active intervention over a sufficiently long period.
  - The third reason is simply the combination of the first two. The world requires change, *and* we aspire to do great things. In fact, it would be foolish to embark on a process to create change unless both conditions are true. Successful change occurs when aspiration meets opportunity.
- **Vision:** Every change process has an intended destination, and that destination is described by a vision. We literally *see* or otherwise sense the preferred future, a future that draws us forward. Articulating a vision that others respond to is the second principle of successful change.
- **Commitment:** Change is harder to do than most people realize. It takes longer, is more expensive, and contains more mistakes than most imagine. How many times have we heard, "If I knew how hard this would be, I might not have started?" As a result, successful agents of change make an open-ended commitment to see it through no matter how long it takes or how hard it becomes. Like a marriage vow, we really do not know what it will take, but we remain resolved to stick with it!
- **Communication:** Everyone puts communication on the short list of attributes for successful change. And most are usually thinking about conveying information, which is important, but not the most important.
  - In fact, the most important aspect of communication is not sending out information at all. Rather it is listening—listening for the aspirations and fears of the people involved, listening for the best approach at each step, listening for the issues and pitfalls that may appear.
  - After listening, the most important part of communication is not sharing information, but returning to the vision. Why did we begin this process? What are we doing this for? How good is it going to be when we arrive? Problems and difficulties are inevitable; the vision is the one thing that keeps people moving forward in spite of obstacles.

- After that, yes, keeping everyone informed, as well as can be, about what is happening and what is planned to happen is very important.
- **Trust:** Mistrust, politics, factionalism destroys many change efforts. The problem is that the change process is complex, if not chaotic, and we are not able to look into another person's heart or mind and decipher their motivation. Are they working in good faith with us or are they working for themselves or their small group? Most do not initially trust those who promote change because their experience led to outcomes other than those promised. Creating trust is simple, but hard to do; destroying it is easy and takes no time at all. We create trust when we speak the truth and when we do what we promise. We destroy it by doing the opposite.
- **Leadership:** Spontaneous change simply does not occur. Rather it takes a person or a small group to stand up and say, "This can be better. Here is how it could be. We can make our vision a reality." We revere leaders like Abraham Lincoln, Susan B. Anthony, and Dr. Martin Luther King, Jr. for successfully promoting fundamental change in society. A leader is the one who makes the case for change, who owns the vision and is committed to doing what it takes to succeed, who listens to people, and who is trusted for working for the good of the group.

Easy to say, but hard to do, and that is why change processes fail more often than they succeed. The *status quo* has been around for a long time. It is entrenched. It has enormous capacity for defense and resistance. So creating fundamental change is no easy task. But sometimes we must do it anyway. If the world is changing, then we, individually or collectively, must respond. And we must educate this generation on how best to create change so they can live successfully and happily in their future.

### So Why Teach the Future?

Enterprises change when the world changes and when members of the enterprise aspire to do something significant, if not great. The world is changing and at an accelerating pace. And with this change comes the need to learn new skills.

The current model of public education was created to prepare students for the industrial age. Be on time, stay in formation, do the work, accept supervision and most of all, know the right answer. These skills made the workers of yesterday's factories and bureaucracies successful.

But now, gone is the majority of factory employment and gone are offices wedded to rigid procedures and command-and-control processes. The pace of the world has quickened, driven by fast-paced information flows. Flattened organization, networked workers and collaborative technologies facilitate flexibility and quick response to the information age.

As the world environment changes so do the skills for success. We submit that the successful will be those who have mastered the basics of change, how to anticipate it, how to manage uncertainty and ambiguity, and ultimately how to proactively create the changes necessary to bend the future to more preferable outcomes. And the time to teach these skills is now.

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