



COURSE 2

FORECASTING SKILLS

READING MATERIAL

Learning is Earning
in the National Learning Economy

A Research Map from Institute for the Future, 2015



INSTITUTE FOR THE FUTURE

FUTURES THINKING

taught by Institute for the Future with **Jane McGonigal**



COURSE 2

FORECASTING SKILLS

Our default tendency is to believe that the future will be largely like the present. But this is rarely true. For a majority of people, the future comes as a surprise – or even a shock. With strong forecasting skills you can overcome this bias and become better prepared to adapt and benefit from change.

In this course, you'll learn how to turn groups of signals into compelling forecasts. Forecasts are evidence-based, but often surprising, visions of the future. They can help you illuminate new possibilities and opportunities—for yourself, for your company, or for any community you want to inspire. We'll show you exactly how it's done: Leading futurists from the [Institute from the Future](https://www.iftf.org) will share with you the forecasts they're most excited about right now and walk you through the key steps they took to create them.

You'll also practice generating scenarios out of your forecasts. A scenario is a very short story about a specific possibility that could happen in the future you've forecast. Scenarios capture imagination and provide concrete examples of how, exactly, the world might be different in the future.

Forecasting skills help you see hard-to-imagine futures before they happen. They enable you to consider possibilities that others might never see coming or refuse to accept. With this foresight, you can evaluate which futures you want to make more likely and which futures you want to prevent.

About this Specialization

The Institute for the Future is declaring 2020 “The Year of the Future,” because we believe that foresight is a human right. Every human should have the chance to develop the creative skills needed to imagine how the future can be different, and to participate in deciding what the future will be. We believe futures thinking shouldn't be something that only happens in Silicon Valley. With our specialization in Futures Thinking on Coursera, we are the first organization ever to offer massively open, free training in futures thinking. We aim to upskill the entire planet in future thinking and future making, by teaching one million online learners via the Coursera platform. This text is one of 100 free readings distributed as part of our “Year of the Future” training.

Institute for the Future

Institute for the Future is the world's leading futures thinking organization. For over 50 years, businesses, governments, and social impact organizations have depended upon IFTF global forecasts, custom research, and foresight training to navigate complex change and develop world-ready strategies. IFTF methodologies and toolsets yield coherent views of transformative possibilities across all sectors that together support a more sustainable future. Institute for the Future is a registered 501(c)(3) nonprofit organization based in Palo Alto, California.
www.iftf.org



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LEARNING IS EARNING

in the national learning economy

Until recently we thought of working, learning, and living as separate experiences. We spent most of our childhood in school and our adult years working or looking for work, and then we squeezed our personal lives into whatever brief windows of time were left. We usually “did education” early in life, stopping when we reached the limits of our resources, whether they were time, money, or institutional offerings, and at that point were categorized as unskilled, blue collar, white collar, and professional workers. Such categories, in turn, circumscribed the kinds of lives to which we could aspire.

Today, an emerging learning economy is changing all that as learning becomes a currency for everything we do. Unbounded learning resources are creating opportunities for continuous growth, opening the future to new possibilities and aspirations. Blends of digital and physical experiences are creating platforms that make it possible to integrate learning into workflows that are blurring the boundaries between life and work and between learning and living. These platforms provide continuous actionable feedback that helps us adapt and shape our environments to our personal needs, passions, and life circumstances. They use computer algorithms—intelligent programs—to match us to people and opportunities that can help us find ever more value and meaning. They support collaborative networks that can change the way we think about the problems we face and help us find workable solutions at work, at home, and in our communities. In the process, we build our individual working-learning-living brands: the distinctive roles we'll play in a fast-paced economy of change.

These flows, resources, platforms, and programs comprise the innovation zones of the future. How we invest in them and build them out are the keys to a vibrant new economy founded on a continuous cycle of learning and earning.

FUTURE FORCES

RESHAPING THE WAY WE WORK, LEARN, AND LIVE

Behind the emerging learning economy are underlying trends that are integrating learning exchanges into every aspect of our daily lives—from what we eat for breakfast to a new task we undertake for pay to the way we share moments with a friend or a family member. These future forces are driving the budding learning economy.

learning commons

Digital resources are not subject to the “tragedy of the commons”—the more they’re used, the more valuable they become. New commons, especially commons of learning resources, lay the groundwork for all kinds of new exchanges.

maker mindset

A do-it-yourself ethos is creating an entrepreneurial approach to working, learning, and living. This maker mindset becomes a do-it-*ourselves* ethos as digital and physical spaces bring us together in new ways.

digital natives

Those born after 1990 are growing into adulthood as natives of a digital world, with smart devices and a World Wide Web at their fingertips. From media literacy to computational thinking, they are pioneering a new economy of digital skills.

coordination platforms

Platforms designed to match people with tasks and resources, for money or simply for engagement, are forging new ways to work and learn. These platforms will rapidly increase the marketplace choices for working learners.

collaborative tools

From scientific research to global work teams to online music groups, digital media have boosted our ability to collaborate. The result is rapid growth of knowledge resources and responses to solving problems.

human-machine symbiosis

Smart machines are replacing some kinds of human labor while augmenting others. Machines are rewriting the rules for how we work, learn, and even manage our households.

decoded brain

Advances in neuroscience and behavioral science are generating new techniques and tools for optimizing learning and organizing work tasks. These tools, in turn, are changing the way we think about the entire enterprise of working, learning, and living.



A NATION OF WORKING LEARNERS

Working learners are the drivers and beneficiaries of the learning economy. Who are they? How do they navigate this dynamic and uncharted landscape? How do they bank their learning as currency? The following four working learners, while fictional, were synthesized from research on the skills, mindsets, and experiences of real working learners who are thriving today.



Carol Forester 20, Ankeny, Iowa

Coming home to roost: **From retail clerk to community change agent**

With only a high-school education, Carol Forester was having trouble making ends meet as a store clerk in the booming Des Moines suburb of Ankeny where she grew up. That is, until she found Roost. It's a co-working space and incubator, not for tech startups but for social inventors. Tapping an ever-richer stream of Roost resources, from free digital courses and peer-learning exchanges to movie nights and community experiments, Carol became a regular at Roost events, volunteering in exchange for microcredits for learning. After six months of volunteering at all kinds of community events, she found herself co-teaching some Roost classes herself and struggling to find enough hours in the day for her paying job. But with microcredits adding up and her volunteer activities expanding her network of contacts throughout the community, the volunteer gigs started to turn into part-time job offers: floor manager for the new food bank, development staffer for the local branch of a national aid organization. "I was feeling so lost just a few months ago," she confesses, "but Roost has become my life GPS."



Michael Harris 24, Seattle, Washington

Second chances: **From correctional facility to upskilled microwork**

Having spent three months in the Monroe Correctional Complex for minor drug charges, Michael worried that he had already blown his life and wouldn't be able to rise above the random series of Uber rides he chased to support himself and his three-year-old daughter. Enter UpBurger, a new fast food chain that doesn't discriminate against workers' backgrounds and even promises upskilling as part of its mission. UpBurger doesn't pay particularly well, but Michael immediately noticed how closely his supervisor tracked him. He learned that computer algorithms were monitoring him—not to punish minor offenses but to identify his strengths. UpBurger began training him for tasks that matched his aptitudes and also increased his take-home pay—all through their internal online placement platform. His most common gigs involve repair of industrial kitchen equipment, something he never would have thought to pursue. He is still hoping to find more time to spend with his daughter but is sure the time they do have together has improved as his confidence has grown. He is often amazed how this innovative fast food restaurant turned his life around.



Alejandra Gomez 15, Green Valley, Arizona

Migrating platforms: **From C student to venture-backed bio-hacker**

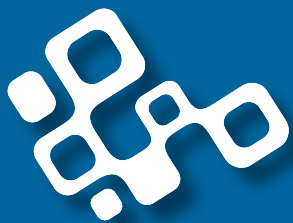
Alejandra's parents worried about their daughter's future as the child of Mexican immigrants. In spite of teachers' praise for her cleverness in pattern recognition and problem solving, Alejandra rarely got grades above a C, while she spent most of her time on her tablet playing elaborate puzzle games. Then, one day, a DNA-shaped trophy arrived in the mail, addressed to her. She'd won an online protein-folding competition on the online Bioreddit community forum. Bioreddit hosts an eclectic mix of science researchers, PhD students, and amateurs like Alejandra who build their reputations by solving challenges posed by large universities and medical labs. A few months after the trophy arrived, Alejandra surprised her parents again with an invitation to participate in a bio-hackathon at Sequence, a science-themed makerspace in nearby Tucson. Her parents were skeptical until Alejandra revealed the real-world identities of the participants, including several senior researchers from the University of Arizona. Alejandra's reputation skyrocketed at Sequence, and now she's spending most of her afternoons and weekends on paid initiatives from the makerspace, funded by venture investors.



Simon Birech 28, Newark, New Jersey

The game of life: **From undervalued accountant to standout specialist**

When Simon lost his job at a big NYC accounting firm, he had to move to Newark and downsize his apartment, his job expectations, and his monthly support payments to his family back in Nairobi. Even with a formal education in corporate accounting, he found himself stuck with a low-level job for a local firm. Better jobs seemed to require new specialized skills, but he didn't have the time or the money to go back to school. Then he discovered microskilling apps on his smartphone, which dole out 15-minute bursts of learning he can do in his spare time. Obsessed with finding all the small opportunities to learn, he focused on skills that would distinguish him from the pack, eventually realizing he'd need an understanding of advanced mathematical formulas to get to the next level. The textbooks seemed impenetrable, but then he heard about a new immersive gaming system that makes this kind of learning more intuitive. So he borrowed virtual reality hardware from his local library and now spends his evenings in advanced mathematical visualizations. As these efforts pay off, Simon is finding himself working to improve the learning games that are simultaneously helping his own career.



INNOVATION ZONES IN THE LEARNING ECONOMY

Degrees, grades, and resumes have been traditional tokens of value or currencies in the workplace for decades. But the value of these currencies is shifting as the pace of innovation quickens, laying the groundwork for a new economy—a national learning economy. In this emerging learning economy, new underpinnings provide the basis for learning itself to become a currency for success and life satisfaction. To navigate the terrain and understand the new currencies, we'll need to reorient ourselves to what's possible. These eight innovation zones represent the most important contours of this emerging topography.

unbounded resources

In 2010, Bill Gates correctly predicted that “five years from now on the web for free you'll be able to find the best lectures in the world ... It will be better than any single university.” Today, the rapid growth of online knowledge resources, whether for fee or for free, is creating an abundance of learning resources in a variety of formats. These range from massively open online courses (MOOCs) to live-streaming experiences via platforms like Periscope and the treasure trove of video instructions and augmented realities that offer both structured and informal learning opportunities. Such resources can jumpstart workplace advancement and earnings growth. But as working learners in this world of unbounded resources, we will need roadmaps that connect the dots between learning assets and the career opportunities they open. At the same time, as families, we will turn to these assets to support our family rituals and our extended communities. Learners in all contexts will build new skills for discovering, categorizing, and even creating learning resources.

actionable feedback

In a world of big data, advanced analytics, and growing reputation markets, feedback is getting ever more nuanced. In learning, in work, and in life, we no longer have to depend on blunt instruments like institutional performance reviews and even 10-step self-help checklists. More and more, we will get detailed, personalized feedback that we can act on right now. Many of the leading-edge performance tools will borrow from the realm of gaming, where players can fail many times but are motivated to improve in order to achieve a higher level in the game. Similarly, real-life performance tools will replace grades with compelling learning incentives and high-resolution metrics for the complex set of skills that today's work and life challenges present. These tools will be used to construct the customized learning paths described above. They will identify entire constellations of strengths and weaknesses to guide us in our learning investments. In short, feedback will be an invaluable currency that we can use to improve our lives.

digital-physical blends

Mobile devices, sensors, and geo-location tools are rewriting the scripts for how we use physical spaces and objects to learn and work. Combined with the abundance of online content, these tools are building learning exchanges into every space, creating sensory-rich experiences that can't compare with traditional classroom learning or traditional workplace environments. From tech shops and co-working spaces to cars and construction sites, our workspaces are increasingly embedded with context-aware information and instruction that we can convert into learning, productivity, and innovation. Even our recreational activities will blend the physical and digital worlds to instantly deliver information where it makes the most sense to receive it, whether it's a walking path through a part of town where artists are reinventing how we interact with public space or a farmers market where we can use our phones to identify unfamiliar vegetables and get instant recipes for them. In this world of embedded intelligence, we all become sensors and sense-makers.

algorithmic matching

An algorithm is a computer program, often one that solves a problem and discovers a hidden pattern. Today, algorithms frequently take on the role of matchmaker—they find us taxis, recommend movies and books based on our previous viewing patterns, and even connect us to potential love interests. They do this by sorting through our digital data trails to discover individuals, institutions, and opportunities that match our unique profiles. Over the next decade, these kinds of algorithms will change how we learn, work, perform our daily activities, and get what we want. Companies will match us with institutions, courses, tutors, internships, and employers, all with a simple swipe of a finger. The tasks we perform for pay may be assigned by matching algorithms that track our past task performance, our reputations, our social networks, and even our learning styles. Perhaps most important, these matching algorithms and the digital trails they mine are the currency that will connect us across institutional silos if we use them well.

continuous learning flows

The traditional model of education is episodic: learning takes place in a particular setting (such as a classroom), at a particular life stage (usually childhood and young adulthood), and with specialized teachers (teaching disconnected curriculum). But this kind of episodic education simply doesn't prepare us for a global economy built on innovation. It can't keep pace with the rapid production of new knowledge and the need to continuously turn that knowledge into new skills, new career paths, and new lifestyles. Over the next decade, with advances in mobile and wearable technologies, learning will spill into all our daily activities. Digital flows will be designed to help us learn as we go through our days, whether we're mastering the bacterial science we need to set up a food truck or discovering the management and marketing skills that will help us convert a spare bedroom into a successful Airbnb rental. These learning flows will turn every exchange with friends, family, customers, or co-workers into a potential moment of new mastery.

solutions networks

The way we solve problems, whether they are complex scientific questions or just the challenges of everyday life, is shifting from individual work or even teamwork to work involving large networks of people, often around the world. With platforms like Quora, we are using these networks to find the best solutions for everything from complex math problems to answers to personal life questions, such as “should I date this person?” Growing up in a world of constant connectivity, today's young people will take for granted that they can turn to their networks for guidance, knowledge, and smart solutions to problems they would never tackle alone. Mobile devices will make it possible to carry these networks—always on and always available—in our pockets. In this environment, individual performance and IQ will take second place to network performance and network IQ, and the most successful people will be those who learn how to learn together.

personalized experiences

One size does not fit all. Every working learner has a unique profile, and a combination of computer analytics and new human attitudes will help us adapt learning and working to our individual needs and circumstances, even as we ourselves adapt. Just as a personal trainer creates workout regimens based on our unique needs and preferences, data analytics and mentors alike will analyze our goals, strengths, weaknesses, approaches to learning, and timeframe and then present us with personalized work-and-learn pathways that maximize our life satisfaction. Already, new platforms are beginning to offer tailored learning paths based not on a standard curriculum for a fixed job objective but on a dynamic analysis of where we, as individuals, easily succeed and where we may need extra help. Over the next decade, these “fitness guides” will join us in the workplace and at home, helping us turn challenges into personal growth opportunities by adapting abundant online and offline resources. They will help us continually reinvent ourselves as the world around us becomes ever more unpredictable.

dynamic reputations

Success in the learning economy is all about building our brands as workers, learners, and citizens of the communities that matter most to us. Reputation and digital performance trails will begin to carry more weight than college degrees and one-page resumes of employment as we begin to track learning that happens anywhere, as we work in global networks where our performance on one task determines how likely we are to get hired for another task, and as we contribute our own knowledge and resources to online communities. Indeed, digital freelancing platforms have found that past performance on similar tasks, not formal education, is what employers look at when hiring. Innovations in credentialing will lay a new groundwork to better represent our personalities and capabilities with new kinds of reputation markers such as nanodegrees and digital badges as well as digital trails that document perhaps the most essential skill in the new learning economy—our social intelligence.

YouTube has become a primary resource for problem solving, with millions of user tutorials that cover everything under the sun—including how to create a YouTube tutorial.
youtube.com

TEN WEEKS. ALL DAY. EVERY DAY.

General Assembly, a boot camp-style school for working learners, has chosen to remain unaccredited because the skills and tools they teach change faster than accreditation cycles.
generalassembly

maker mindset

Detour is a platform for location-aware audio walks, where the stories of a place “pop up” as the listener approaches.
detour.com



digital-physical blends

Embedded intelligence turns every space and activity into a learning exchange

Immersive journalism combines virtual reality with real audio recordings to create riveting simulations of catalyzing events, such as the Trayvon Martin shooting, building empathy in those who experience it.
emblematicgroup.squarespace.com



Clio brings a city's rich history to life, using mobile technology to surface user-curated historical facts, cultural records, images, and personal stories of a location for interested passersby.
theclio.com

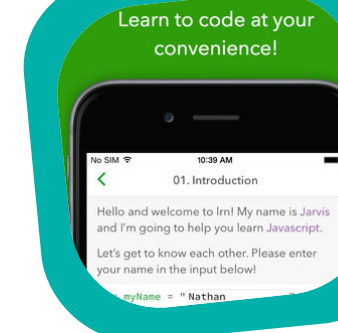


digital natives

College Unbound pairs nontraditional students with a mentor who crafts a unique educational plan for them and helps them create an online portfolio.
collegeunbound.org



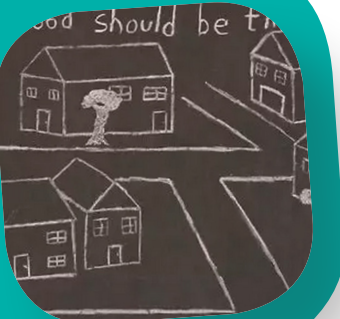
Lrn is an app that uses downloadable, interactive mini quizzes to teach people how to code in small bites while on the go, making it easy to integrate learning as they go about their days.
lrnapp.com



Degreeed considers every moment a learning moment, including the time you spend online. It creates profiles of employee knowledge and skills based on their browsing history.
degreeed.com



Learn.PGH is a directory of nontraditional learning opportunities in Pittsburgh, including curated paths of local and digital connected learning experiences that allow learners to build towards mastery while connecting with community.
learnpgh.org



personalized experiences

Adaptive learning experiences increase fit and fitness for success and satisfaction in life



CogniToys is a toy crowd-funded through Kickstarter that connects to IBM's Watson to interact, learn from, and age with a child as they mature and their needs change.
elementalpath.com

Thync is a wearable device that transmits low-wave signals to the brain, helping working learners to de-stress or re-energize within minutes and getting them in the right mindset for the task at hand.
thync.com



decoded brain

Knack.it uses games to help individuals discover their own “knacks”—their skills, traits, and talents—and then uses that information to match them to job opportunities.
knack.it



coordination platforms

Gigwalk Enterprise's algorithm assesses employee performance and strengths based on variables like the time it takes to open an email, and uses that information to route tasks to people based on their capabilities.
gigwalk.com/enterprise



algorithmic matching

Digital profiles match people, tasks, and resources in the work-learn-live marketplace

human-machine symbiosis

CoffeeStrap pairs language learners with peers who have similar interests on demand, and then it tracks proficiency based on those conversations.
coffeestrapp.com

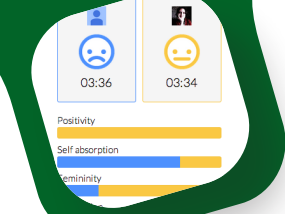
actionable feedback

Data analytics maximize return on learning investments

Minerva assesses students on competencies and awards individual grades for every comment they make in class—producing a responsive map of their skills over four years.
minerva.kgi.edu



US+ uses facial recognition and speech analysis to provide real-time feedback on conversational skills and interaction.
lauren-mccarthy.com



Duolingo offers bite-sized, gamified language learning with instant feedback, rewards for streaks of correct answers, and opportunities to “level up.”
duolingo.com



unbounded resources

Access to abundant information and learning resources jumpstarts advancement

Udacity offers busy working learners short industry courses that are certified and accepted by companies looking to hire directly for those specific skills.
udacity.com/nanodegree



GitHub, an open-source social programming platform, has become the new resume in coding circles. A developer's profile and contributions become his or her work portfolio.
github.com

Mozilla Open Badges helps users to track skills learned informally by issuing verifiable digital badges that are stored and displayed in a “digital backpack.”
openbadges.org



dynamic reputations

Digital trails build our brands as workers, learners, and citizens



Upwork, a microwork and digital freelancing platform, has users receive reviews for each job they complete and asks them to constantly prove their skills with hyper-specialized skills tests.
upwork.com

collaborative tools

Reddit's “Ask Me Anything” open messaging platform allows anyone to post a question and receive multiple responses from the crowd.
reddit.com/r/AMA
image: thekingofrandom.com



solutions networks

Collaborative learning builds marketplace solutions to problems in work and in life

Zooniverse conducts people-powered research—tapping into a vast network of “citizen scientists” to analyze research data at scales even an algorithm cannot match.
zooniverse.org



HOW TO USE THIS MAP

Looking ahead to the future is a way to make better choices today. This map helps us see, at a glance, how eight innovation zones will shape the emerging learning economy and will contribute to overall life satisfaction in the coming decade.

What you will find on the map

The map has two sides—a visual side for seeing the big picture and a text side for probing the key stories of the future in more depth. Whether you look at the big picture or delve deeper into the stories, this is what you'll find:



FUTURE FORCES: These are the underlying technological and social shifts that are destabilizing the learning landscape of today and driving the formation of the new learning economy. They are color coded to match the innovation zones they influence.



INNOVATION ZONES: The map identifies eight new zones within which working learners will innovate and shape their own futures over the coming decade, with forecasts of how they will change the way we work, learn, and live.



PROFILES OF WORKING LEARNERS: To bring the future of the learning economy to life, the map introduces us to four working learners who, while fictional, represent the aspirations and possible pathways of the young working learners who will shape the next decade.



SIGNALS OF THE FUTURE: The future is already unfolding today in innovations across the country and indeed across the globe. This map includes leading-edge signals of how these eight innovation zones are creating pathways for success and life satisfaction, and how they will ultimately support the future economy.

What to do with the map

Once you've had a chance to get familiar with the map and the emerging learning economy, you can put it to work for you as a strategic tool:

1

EXPLORE THE OPPORTUNITIES IN THE LEARNING ECONOMY: Scan across the innovation zones to see which ones offer the best opportunities to make your life or the lives of those in your community more meaningful. Make a list of opportunities for each, and then check your readiness to take advantage of them.

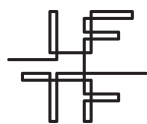
2

BUILD A STRATEGY FOR SUCCESS: Whether you're a working learner, a policymaker, or a service provider, you can use the innovation zones to build a path to your own future. Pick the three zones that best fit your goals and constraints and make a plan that puts them to work for you. Play around with different combinations to consider different scenarios and reveal unexpected paths.

3

TRY OUT THE FUTURE: You can use the signals on the map to immerse yourself in the future today. Choose a few signals that seem immediately useful for your strategies for success and try them out. Then choose a few that stretch your imagination about how you might work, learn, and live in the future—and try those to see how the future might challenge you to think in new ways.





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