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The Skills Gap and the Near-Far Problem in Executive Education and Leadership Development

Mihnea Moldoveanu
Professor of Business Economics
Desautels Professor of Integrative Thinking
Vice-Dean, Learning, Innovation and Executive Programs
Rotman School of Management

Das Narayandas
Senior Associate Dean, External Relations and Harvard Business Publishing
Edsel Bryant Ford Professor of Business Administration
Harvard Business School

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Abstract

Executive development programs have entered a period of rapid transformation, driven on one side by the proliferation of a new technological, cultural, and economic landscape commonly referred to as 'digital disruption' and on the other by a widening gap between the skills and capabilities participants and their organizations demand and those provided by their executive program providers. We document—on the basis of transcripts of some 100 interviews with Fortune 500 executives—a current and growing awareness of a mismatch between executive development offerings and the skill sets executive need in a VUCA, Web 2.5-enabled economy. We show that a trio of forces of digital disruption—specifically the disintermediation of the services of instructors and facilitators, the disaggregation of the previously bundled experiences that constitute an executive program, and the decoupling of the sources of value participants derive from any one experience—together open up the executive education industry to a radical restructuration. We argue that any consequential strategic action on the part of providers must address two major current gaps: the gap between the skills required by participants and those provided by suppliers ("the skills gap"), and the gap that separates skill acquisition from skill application ("the skills transfer gap"). We canvass the literature on skill measurement, acquisition and transfer to establish the enduring power of these distinctions in explaining the success of various training and education programs. We use these distinctions to structure the landscape of strategic decisions that both organizations committed to organizational development and providers of executive development programs must in very short order make.

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2015: Executive Development in Disequilibrium

Organizations today urgently require new managerial and executive capabilities to cope with an array of challenges, from coping with narrowing profitability gaps to enabling continual innovation; increasing customer responsiveness to meeting regulatory requirements; contending with demand-side volatility and uncertainty to managing increasingly complex new services and value chains. To meet these objectives, organizations must develop predictive prowess, agility, innovativeness, resiliency, creativity, and other novel capabilities they are finding difficult to cultivate in their executive and managerial teams. These resulting tensions are fueling a growing feeling among business leaders that business schools and organizations providing executive development are not adequately preparing the individuals who will be recruited to populate these teams (Canals, 2011). An "executive skills gap" between the skills needed to cope with a volatile, uncertain, ambiguous, and complex (VUCA) business landscape and the skills being imparted by executive development programs is increasingly obvious—and, costly.

Business executives attending executive programs are seeking not information or knowledge, but skills (Schrage, 2014) of a kind and quality not presently being delivered by executive development programs. An IBM survey of 1,500 chief executives (Palmisano, 2010) provides an example of not developing the right skills in individuals capable of applying them at the right time and in the right context: a majority of those surveyed worry about their own as well as executive team members' ability to manage complex predicaments in the competitive, regulatory, operational, and organizational environments in which they work. CEOs also report a scarcity of the trust, creativity, resiliency, fault-tolerance, and experimental zest and intensity that characterize high performing organizations.

Concomitantly, a pattern is emerging of next-in-line executives being bypassed for promotions to top leadership positions (BCG, 2016) in favor of raw, unproven individuals who are up-to-date on technical, interpersonal, and functional skills, albeit likely to

require ongoing support and continuous investment in the requisite management and leadership abilities. Executive learning and development providers—business schools, professional consultancies, and corporate universities, among other groups and institutions—face a pivotal time of challenges posed by technology-driven disruption of business activities increasingly characterized by VUCA conditions as well as unprecedented opportunities to develop new programs and services that address the growing "executive skills gap."

VUCA Worlds Reward the Adaptive: The Pressing Demand for New Skill Sets

Demand for executive and managerial talent is growing, driven in part by shortages of skills and capabilities in established economies and the growth of emerging economies. Witness the premiums and increasingly frequent bidding wars for managerial and executive talent. In the wake of the financial crisis of 2007-2008, many organizations have greatly expanded their leadership development activities, and professional services firms like Morgan Stanley, Deloitte, and others appointed chief talent officers (CTOs) to attract, retain, and develop top performers (Canals, 2011). Discontinuous changes in organizational scale, scope, and culture confound efforts to navigate disruption and complexity, ever more intense competition, and demand volatility. Consider just the latter. A snapshot of volatility across industries (Boston Consulting Group, 2015) over the period 2002-2010 reveals heightened unpredictability in the form of greater average error in earnings per share forecasts and increasing costs of getting the prediction wrong, as signaled by the gross difference in revenue margins between leaders and laggards in any one industry (**Figure 1.1**).

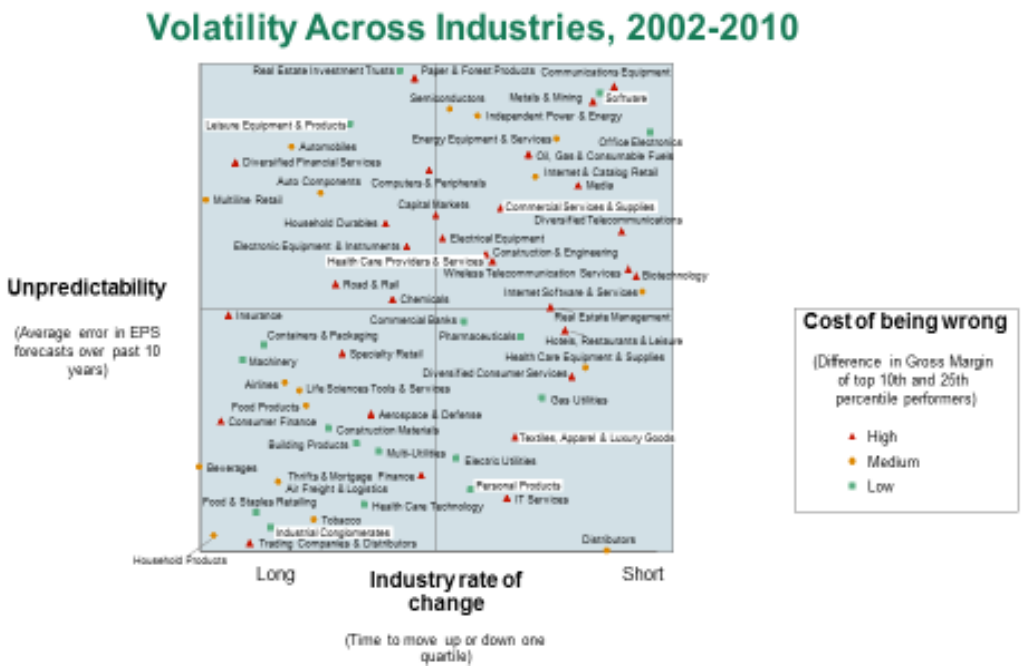

Figure 1.1. A snapshot of volatility, and its costs, across industries over a decade. (Source: Michael Ringel, Andrew Taylor, and Hadi Zablit, "The Most Innovative Companies: Four Factors That Differentiate Leaders," Boston Consulting Group, December 2015.)

This picture brings into sharp focus the stress VUCA environments exert on organizational capability and executive skill. Predictability proxies for the capacity of organizations and executive teams to manage across periods of uncertainty and disruption; the cost of "getting it wrong" highlights the irreversible and unforgiving nature of the resource allocation process across industries. Observed an executive of the Singapore Workforce Development Agency: "The pace at which skills become obsolete has increased, which makes it harder to plan for changing needs. As new needs emerge, skills are acquired in an ad hoc way based on need rather than any developmental template." The value of high-velocity, adaptive, insightful leadership should rise with the accelerating pace of change and increasing likelihood and cost of making errors, and that is precisely what we are seeing.

The race for organizational capability and competition for attracting and retaining the skill base on which it rests is intensified in VUCA environments (**Figure 1.2**). Mature market leaders are dropping out of the top-three industry positions. More recent arrivals outside of the top five market leaders are within five or fewer years of attaining market leadership (**Figure 1.2**). These effects propagate across industries, "disrupted industries" (e.g., banks in the 2000s, specialty retail in the 1990s) constituting the leading edges of "waves of organizational failure."

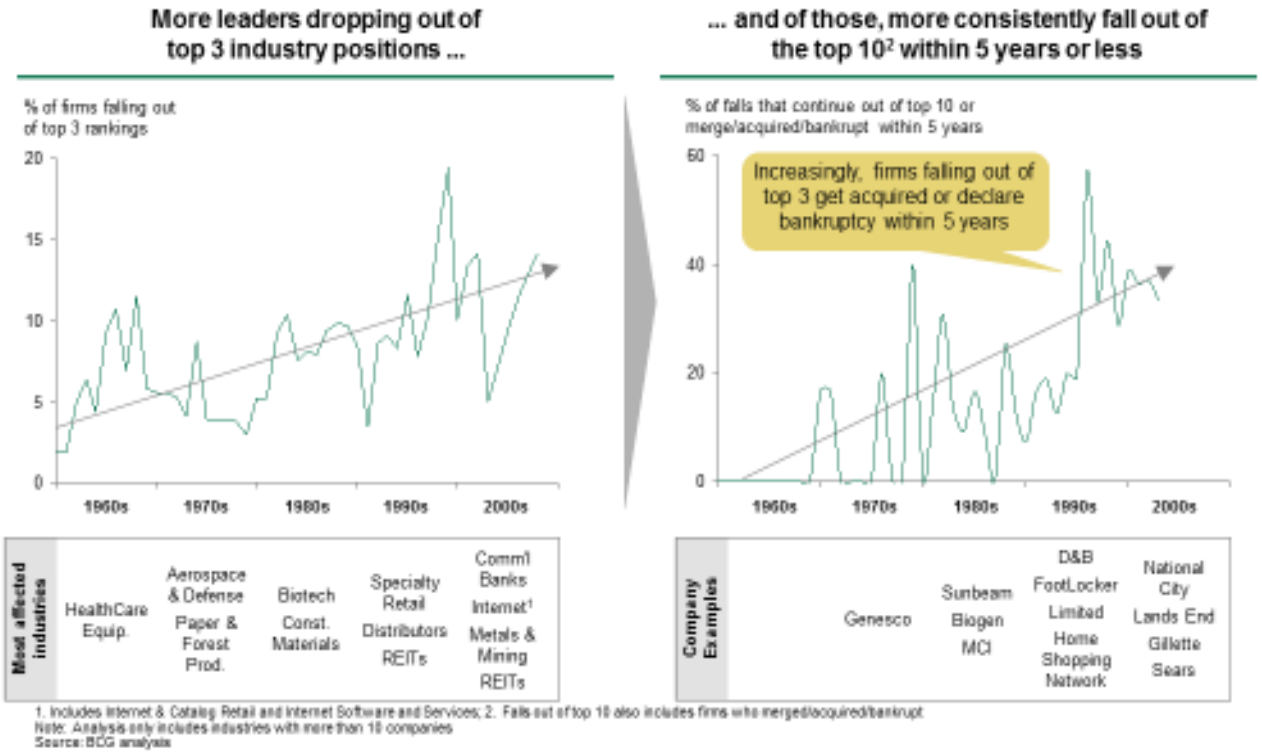

Figure 1.2 VUCA-induced "waves of failure" among industry leaders propagate across time and industries. (Source: Boston Consulting Group, December 2015.)

The effect is more pronounced over long periods. A snapshot of the media industry (**Figure 1.3**) compares the effects of the VUCA landscape (greater volatility in the position of market leaders) with those of environments of unbridled expansion (1970s-1980s) and increased competition (1980s-1990s).

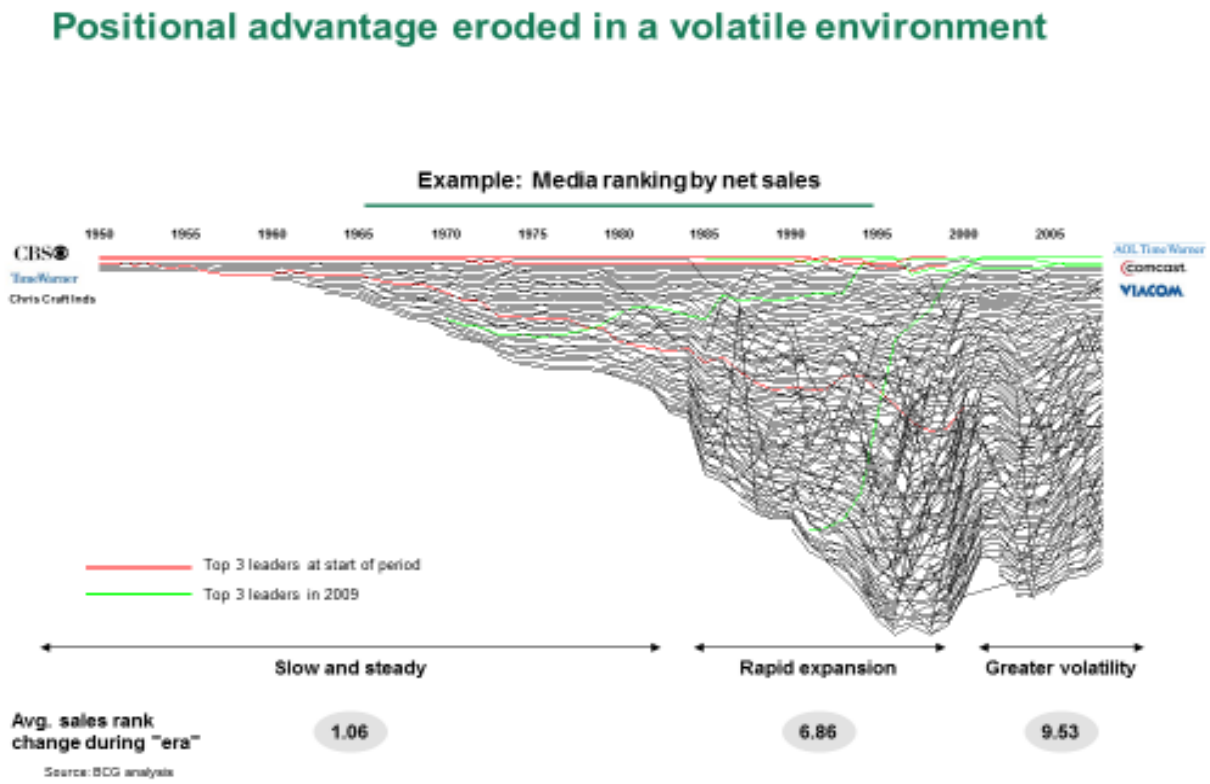

Figure 1.3. **Effects of the VUCA environment compared to rapid expansion and intensified competition in the media industry**. (Source: Martin Reeves and Mihnea Moldoveanu, "Adaptive Strategy and Organizational Algorithmics," BCG Strategy Institute, December 2011.)

Many executives have acknowledged the extreme compression of the time scale on which dramatic change occurs at the technological, industry, customer demographics and preferences, organizational, operational, and interpersonal levels. Observed a pharmaceutical executive: "Ten years ago we had a decade to adjust and prepare for what was coming, but today the adjustment cycles are much shorter. How do you prepare for that? For instance, digital transformation is something we are not prepared for because our leaders came from a different school of thought. We are not moving as fast as we would like." "We need a strong pool of internal candidates for the CEO role," remarked an executive in Newcastle Permanent Bank Building Society Ltd. "If I decide to leave or

the board tells me it's time to go, we need executives capable of stepping into the CEO role on an interim basis and also, ideally, as potential candidates for the role on a permanent basis." A 2011 study revealed that only 15% of North American companies believed they had enough qualified successors (Fernández-Aráoz, Groysberg, Nohria, 2011). Tailoring efforts to the development of particular skills and needs is critical considering the leadership talent shortage that will only grow as baby boomers retire (Silvestri, 2013). These findings suggest a crossroads in the preparation—selection, training, development, and nurturing—of the elites of leading organizations, an intersection of crisis and opportunity that manifests in the domains of talent officers and executive program developers as extreme ambiguity. Remarked an executive at a large cable provider: "We have to create a pipeline for jobs that don't exist. Yes, certain roles we know to develop for, but also there are new areas to develop for. We don't even know what they are yet."

A simple, compelling, but troubling explanation for shortcomings of executive development as presently constituted is that skills learned in seminars, case discussions, classrooms, and laboratories are rarely applied in the contexts in which they would be most useful. The considerable literature on applicable skill development, and what we know about the effectiveness of teaching with respect to developing skills that will be applied (Baldwin and Ford, 1988), suggest that only about 10% of the $100 billion (in 1988 dollars) outlay on corporate training and development (currently at $178 billion) can be expected to produce any results. "Employees often take a class and say, 'Gee, this is great,' and go back to their jobs and do the same old thing," says a director of one university's executive program in leadership.

Breakthrough learning environments like Google's internal training program recognize and tackle the applicable skills challenge head on by tailoring in-house programs to participants' specific circumstances and social, technical, and physical environments. Learning-on-the-job co-locates skill acquisition and skill application—making the successful transfer of applicable skill more likely. Remarked the head of global learning and development at a professional service firm: "One of my boss's pillars is to

revolutionize the way we learn by focusing on informal learning, collaborative learning that is 'dynamic, social, and personal.' When we talk about leadership development, those are the terms we use. Not just, can you go to a program at Harvard?" The challenges posed by VUCA markets, and the organizational capability gaps they precipitate, demand a fundamental re-thinking of the approach to developing the executives and high potential managers who will lead the organizations of the future.

The Trust Economy and Digital Disruption in Higher Education

Executive learning—and indeed all of higher education—is being disrupted by technological, cultural, and demographic shifts that, in combination, pose a special set of VUCA-type challenges. In any industry, "digital disruption" is minimally seeded by:

1. mass-distributed access to information;
2. ubiquitous and secure private communication in point-to-point, point-to-multipoint, and multipoint-to-multipoint configurations;
3. distributed, inexpensive access to low cost computational power ("the cloud").

These conditions factored in the reconstitution, and continue to be observed in the constant churn of the media, publishing, retail, travel, enterprise software, music, and a host of smaller industries. The knowledge economy industries of the 1990s and early-twenty-first century—financial services, health care, and education—have persisted thus far in the wake of the digital disruption wave. But inexpensive, instantly accessible, ubiquitous information, computational power, and connectivity have laid the foundation for a successor to the knowledge economy: the trust economy. Two more waves are coming quickly, and we will closely examine the dynamics of their propagation elsewhere.

Positional advantages in networks of trust represent powerful new sources of market power, supplanting the information and knowledge (i.e., what can be done with information) asymmetries that were the respective sources of advantage in the pre-Google era and thereafter (Moldoveanu and Baum, 2014). Disruptors like Uber and Airbnb

quickly understood that knowing and being known by the right people for the right thing at the right time—the hallmarks of success in the knowledge economy—can morph into the foundation for new kinds of relationships with clients and customers based on being tested, transparent, and ultimately trusted, and that Web 2.0 platforms could be stretched to support an information sharing environment sufficiently rich to sustain trust networks that proved capable of unraveling the age-old industries of travel lodging and personal transportation. In rapid succession, the "trust me, I know best" sellers' economy of the 1980s and 1990s gave way to the "tell me, so I'll know" buyers' economy of the 2000s, and that is giving way to today's "show me, so I can trust you" economy. Uber was able to "Uberize" its market thanks to novel platforms designed to build trust through maximum responsiveness, transparency, and predictability, precisely what is required to disrupt the largest, most conservative industries.

Onto the growing web of online platforms that make lecture- and seminar-based teaching transparent and replicable at low cost—currently a $50 billion market—has been grafted the platform model, a newly customized executive learning model being used by some of the world's largest organizations (Anderson and van Wijk, 2010). The monopoly on legitimacy that academic institutions have commanded for the past 200 years is being eroded by such platforms, a preponderance of executives expressing a preference for learning from seasoned practitioners and academics rather than just academics (EdX market survey, 2015). That many, perhaps even most, research findings published in leading social science journals are not replicable (see, for instance, *Science* (2014)), or are likely to be invalid as stated (Ioannidis, 2005), is further eroding the claims to validity and reliability upon which academics have traditionally relied. Legitimacy, rather than measurable, replicable, superior learning outcomes, has heretofore been the basis on which the executive development market has built trust.

Responsiveness, transparency, and predictability disrupt an established industry via several mechanisms, all of which are currently in play in the executive development space:

1. fragmentation and re-integration of products and services consequent to the disaggregation of services and value chains;
2. dis-intermediation of service chains and multi-party services;
3. de-coupling of products' and services' sources of utility.

Disaggregation and unbundling of services and value chains. Massively distributed online learning systems (Kroner, 2014) promise to deliver, as needed, context- and setting-specific "skills on demand" to managers and executives. Such offerings can be found in free as well as fee-based configurations and standalone and "certificate bundle" formats, and they exhibit increasing degrees of intimacy and understanding of learners' needs. State of the art platforms like EdX, Coursera, Udacity, Lynda, Udemy, and 2U have amassed large repositories of leading edge content contributed by both traditional suppliers of learning experiences like colleges and universities and leading practitioners and learning organizations including Google, Apple, Goldman Sachs, and McKinsey. Companies availing themselves of this new "Digital Learnopolis" are realizing that it enables a revolutionary change in the way skill development happens—and are actively bringing that change about, through their practices. Explained one pharmaceutical executive:

> We are creating "learning labs" that will serve as rapid response teams to bring training and development solutions to immediate needs and pressing business problems. We were criticized for being like business schools in being too slow in response to the immediate needs of the business. Business schools need time to ramp up for any program if it is going to be at all reflective of our business needs rather than a standard offering, and we have been criticized for being like that when issues have come up over the course of our restructuring and integration. We are responding by creating a pool of moderator-facilitators that can react within weeks or even days to immediate business needs with training and development programs.

With *trust* and *legitimacy* increasingly distributed across many platforms and providers of learning experience, the traditional "bundle" of skill development services acknowledged by a degree or certificate is being broken up.

Technological disruption at its most powerful breeds and encourages cultural shifts. Enhanced access and communication technologies that actualize the concept of learning-on-demand are challenging the very notion and nature of courses, classes, assignments, quizzes, exams, questions, dialogues, forums, and "grades," and the unbundling of experience in the learning space transforming learning and certification processes, habits, and expectations. Owing to the short feedback loop that links investment to outcome in executive development, these shifts are manifesting more quickly in that market than in any other segment of the higher education space.

Dis-intermediation of service chains and multi-party service bundles. Faculty members, prominent leaders, executives in residence, professors of practice, guest lecturers, and other dispensers of learning have long been the basis of business organizations' trust in the competence and excellence of prominent executive development programs. Digital disruption dis-intermediates existing value chains and often gives rise to new ones, as in the case of distributed database technologies that assumed the role of trusted third-party, fee-collecting middlemen in the global payments system traditionally filled by the commercial and retail banking sector (World Economic Forum Report, 2013). Integrators, aggregators, and content providers like EdX and Coursera, as they become more prominent and capable, are challenging business schools, universities, consultancies, and talent development organizations for the role of intermediator between learner and content, learner and method, learner and teacher, and learner and context. Udacity has found that the key to profitable growth and a very large valuation is cutting out the "middleman" universities from the learning production function, and aggregators and intermediators of business skill development programs will likely follow suit.

De-coupling of sources of products' and services' utility. Executive development programs, like MBA and elite undergraduate institutions, have long viewed the value they provide to extend beyond content, and even participants' learning experiences and skill enhancement, to the advantages afforded by networking and expansion of social capital, the prestige that attends being selected into and graduated from a leading program, and association with others whose mindsets reflect different countries and businesses. In Chapter 2, we will unpack these sources of value, each of which can be replicated independently, or "decoupled," in the new technological and cultural landscape of learning.

De-coupling is not unbundling. The latter refers to separating the constituent components of an executive program—lectures, case discussions, and project-based learning sessions, among others—that, offered in conjunction, are associated with a credential like a certificate or degree. Decoupling involves separating out, and offering alternative means of appropriating, the different sources of value in each component. A case discussion, for instance, has value in fostering connections and ties on the basis of shared preparation, disseminating knowledge about a particular industry or company, and developing dialogical and argumentation skill through participation in a case discussion that emulates what happens in the boardroom. Having identified and articulated these sources, it may be possible to design and deploy alternatives or substitutes that perform better along each dimension at lower cost.

The Economics of Executive Development Are Ripe for Disruption

E-learning technologies and platforms can complement business schools' MBA program classroom teaching and learning formats and significantly lower the cost curve for delivery or provide a radically unbundled and potentially dis-intermediated set of alternatives to the MBA degree. Ulrich and Terwiesch (2014) compared the economics and "production functions" of traditional MBA programs with expert-delivered chunks of video content that can be consumed at a student's own pace (asynchronously), combined with mediated and unmediated discussion forums and instruments for testing and

quizzing skill acquisition. Given the current requirement to subsidize tenured and tenure-stream academics' research from the revenue streams generated by tuition and fees (to the extent of an estimated $400,000 per article produced, according to Ulrich and Terwiesch (2014)), business schools face a stark choice between staying the course and risking an unmanageable cost structure or embracing the asynchronous interaction opportunities afforded by online platforms to bring their cost structures in line with revenue.

Executive programs are even more sensitive than MBA programs to return-on-investment (ROI) considerations. Organizations view payment for participant attendance at executive programs as an investment. "Every dollar we put into our people," asserted an executive at McCann Health, "that's not a cost, it's an investment." But organizations are also under quarterly pressure to minimize or justify a large set of consolidated costs as well as to measure and reap the benefits of skill transfer and capability enhancement. Consider that a typical executive education program offered by a high-end provider:

- costs organizations or participants between $1,500 and $5,000 per participant per day;
- averages five days per year;
- has an "optimal" scale of 20-30 participants;
- must be run 5-10 times per year to accommodate the executive echelons of organizations with 10,000+ employees.

Organizations thus face a typical annualized executive development cost of between $750,000 and $7,500,000, net of the costs of:

- selecting participants;
- measuring the degree to which participants' newly acquired skill sets are advantageously applied within the organization;
- measuring the degree to which individual skill sets coalesce into sets of organizational capabilities;

- losing the investment, as well as the executives themselves, for those who parlay the credentials and social capital gained from participation in development programs into employment elsewhere.

Assuming, conservatively, these pre- and post-training costs to amount to around 30% of the cost of the programs, externally provided executive development costs an organization between $1 million and $10 million per year, depending on industry, organizational culture and structure, and the nature of the programs in which the organization invests. Observed an executive in Ernst & Young's assurance business:

> To invest a large amount of money in 1,000 partners is extremely expensive. Plus, we need to do things for all 11,000. So imagine in September last year we assembled 3,000 partners from around the world in Orlando for three days to do training. Not cheap. So we're constantly under pressure to prove that what we're doing is adding value to justify the time and expense.

Now consider this. The aggregation of currently available cloud services (e.g., Amazon Web Services, Google Cloud, Digital Ocean) has evolved to the point that on-demand skills and training can be provisioned to *any* executive at any time for less than $50 per user, per year. These cloud services make computation and storage-on-demand possible in increments that accommodate per-user matching of cost to value, offer client relation management tools that can include pre- and post-tracking of managerial workforce performance (e.g., Salesforce.com), and are capable of delivering content related to specific functional skills available from high-profile providers (including executives, consultants, and business school academics) on-demand, via dedicated, high-visibility, high-reliability platforms. They can further include authentication + user management + content provisioning systems that support customization of internal learning management systems (using kernels from, for example, Blackboard or D2L).

At $50 per user per year, *half of all employees* of a 10,000-employee organization could benefit from an intensive, year-round program of skill development provisioned

through an internally created and maintained cloud-based learning fabric for around $250,000 per year, less than one-twentieth of the $5 million to $10 million per year the same organization would spend on equivalent executive and managerial development programs run by dedicated incumbent providers. The ten-fold growth in the number of corporate universities (from 300 in 2004 to some 2,000 in 2016) (Meister, 2001) plausibly reflects the massive decrease in the cost base of learning infrastructures that can be deployed on demand in response to specific organizational needs, and the impact of which can be amplified by coaches, knowledge experts, and learning gurus who will curate content, map and measure skill acquisition and capability development, and guide participants to the most valuable outcomes.

Executive Skill Development Under Scrutiny

Providers of executive development face an unprecedented set of opportunities for responding to the organizational capability and executive skills gaps posed by the VUCA economy. If we imagine an executive's core competencies and skills as a LEGO set, each piece of which represents a key skill or competence, executive development becomes the business of identifying these pieces and their ideal configuration. Schools' packaging of knowledge and skills is not guided by a blueprint of how these pieces fit together (Canals, 2011). The LEGO set is about to undergo a major upgrade informed by two decades of research in learning science and executive skill development that has shown each piece to be composed of smaller pieces that reflect a much larger palette of skills and competencies with which to describe managerial and executive ability. These pieces can be recombined in ways that respond to what is now known about the nature of the gap between desired and developed skill sets and the factors on which executive programs can and should be measured.

Developing Useful Skills That Are Applied: The Core Mission of Executive Programs

Signaling participants' new qualifications to their employers and the labor market, personal investment in development, and selection into an elite group are among the

many functions served by executive learning and development programs. Value also accrues to opportunities such programs present for networking with and learning from participants at varying levels within and across organizations and industries, and to the purely personal objective of self-development independent of job requirements. It is important to be precise about the key role skill development, understood as the acquisition and refinement of applicable, relevant, transferrable, useful skills, plays in the design and deployment of executive development programs.

This can be illustrated by a thought experiment. Suppose that leading providers of executive learning programs discovered the skills and capabilities they teach, develop, nurture, or otherwise impart to participants lack the value they are widely perceived to possess, whether because the content is hopelessly outdated, the means by which the skills are developed is no longer suited to participants' modes of learning, or the skills are not applied in the organizational contexts in which they would provide value. Suppose that, upon discovering this, these leading providers modified their marketing message to convey *only* the networking and signaling value of their programs. The message would go something like this: "Come spend time with us. You will build great new connections and get to signal the market that you have invested three weeks of your time and $40,000 to attend our program." The fine print might say: "We know our content to be dated and methods of teaching and learning facilitation to be ineffective, but networking and certification are the most important deliverables of programs like ours." Would you consider attending? Should you attend if admitted?

The obvious answer is "no" to both questions. You might exploit the signaling value of the program by posting your admission letter on LinkedIn or Facebook, and if other admitted would-be participants were to do the same thing, also capture the networking value of the program, all for the time it takes to complete the application and the price of the application fee. But you would not and should not attend because of the absence of a credible promise of developing new and useful individual and organizational skills and capabilities. Skill development, after all, is the basis of the selection and

signaling value of such programs as well as of the capability development sought by organizations that invest in them.

A credible promise of skill development is also the basis of any ties formed with like-minded others who are serious about self-development, improving skills, and broadening social capital. Confidence in the shared objective of learning new skills is what makes such relationships valuable. Skill development—whether through teaching, facilitated, mutual, or blended learning, guided experimentation, or coaching—is the raison d'être of executive programs. The skill and capability development function supplies the substance of these programs as well as the justification for assembly, whereby participants realize any attendant derivative sources of value. To achieve the requisite insight into the present and future of executive learning programs, we must ask . . .

What Is the Executive's Skill Set? Unpacking the Black Box

"What skills are to be developed?" is a question asked and answered surreptitiously throughout primary, secondary, and higher education, with relevance and rigor alternating between being in synergy and in tension. Skill sets like reading, writing, and programming sit at one end of a spectrum, communicating, collaborating, and relating at the other; curriculum revisions are pursued on the basis of learning outcome measures and students' relative and absolute performance on standardized tests.

Executive education being the segment of the education market most sensitive to return on investment , human resources and talent development executives struggle to assess programs' impacts on their people and organizations (Gentry et al., 2013). Managers "routinely judge executive classes" on "relevance, and whether they help them address immediate challenges," observed David A. Garvin (2007), who adds that custom and company-specific programs place the "greatest premium on immediate relevance and practical applications." Even as they find themselves at an impasse regarding the training and development of the next generation of managers and leaders, providers of executive education have been slow, perhaps even reluctant, to try to articulate specific families of

skills associated with superior individual and organizational performance. Given the centrality of executive skill development, and the value of learned skills in the workplace, no overarching vision of the landscape of executive education can escape the challenge of attempting at least a broad outline of the set of skills that constitute the executive's toolbox.

How the skills gap in executive education and talent development is addressed will be guided by which perspective on its source prevails. It might be argued that the *right* skills and capabilities are not being taught or developed either because academic pedagogical practice has drifted, with the independently evolving interests of academics, too far from real business practice or the skill sets needed to succeed in the new economy, are changing too quickly. Or, it might be argued, the right skills *are* being cultivated but *not applied*, that is, participants are not *transferring what is learned in the classroom, lab, and online to the workplace*. These vastly different diagnoses would take program designers in very different directions. Heeding the former leads them to try to *get the right content*, heeding the latter to try to *get the right pedagogy and learning technology*.

Organizations and academics alike are challenged to articulate a core executive skill set that contributes to organizational capability and success. "Our organization struggles with general agreement on what top talent and top capabilities look like and what is required," noted an executive at a large insurance provider. "People have very different perspectives. The challenge is getting your arms around what those capabilities are."

If we ask whether learning science can help, the answer is, it can. Working mostly in the 1950s and 1960s, learning scientists, psychometricians, and labor market econometricians pre-packaged skill mapping and skill measurement. Their questionnaires, measurements, and tabulation methods were designed primarily for large-scale educational programs (e.g., K-12 or college) and a manufacturing and resource-intensive economy that decidedly pre-dates today's information, knowledge, and trust economy, in which computational prowess and factual and general information

are free and distributed and access to information and communication ubiquitous, distributed, and inexpensive.

The U.S. Department of Labor's ONET database of academic papers and policy recommendations references dozens of skills related to manual dexterity, visual acuity, and motor coordination valuable in a manufacturing economy but scant higher-level cognitive and non-cognitive skills needed by organizations today. Skills essential to solving complicated, complex, ill-defined, ill-structured problems that arise in socially-embedded, multi-user, multi-stakeholder environments are subsumed under "complex problem skill," which we are assured is prevalent among magistrates and CEOs but not required of academics or high school administrators.

We attempt here to provide a map of the executive skill set sufficiently complete to enable us to claim that *every executive must possess at least a subset thereof*. Although it may never be the case that any one executive will possess all of these skills, their mapping should serve to focus inquiry into what distinguishes an executive's skill set from the respective skill sets of, for example:

- a recent high school graduate without any special vocational training;
- a recently graduated, BS-level-certified mechanical engineer;
- a certified car mechanic who has graduated from a vocational school;
- a marketing specialist who has worked for five years in the ad-words department of a magazine;
- a neurosurgeon with 25 years of practice removing growths from the temporal lobes of patients' brains;
- a CIA field operative based in Tehran;
- a flight attendant who has just received specialized training in in-flight security operations;
- a PhD-trained artificial intelligence researcher and developer;
- a playwright and director of successful Indie films;
- an Olympic-medal-level decathlete.

Each of these individuals possesses a set of skills, that is, the ability to complete particular tasks with a comparatively high level of accuracy, reliability, and speed, that may be cognitive or non-cognitive in nature and more or less "mental" in execution. These skill sets also vary broadly in terms of their measurability and even observability. We recognize them to be teachable, or at least learnable, and associate their development with structured, often intense, programs of study, learning, training, apprenticeship, and development.

The executive skill set *cannot be merely one of the specialized skills* that enables individual performers to add value to their groups, clients, organizations, or life projects. It must be a *combination of skills* the values of which are super-additive, which is to say, the value of possessing the skills together exceeds the value of one or a few summed across the individuals who possess them. Just as the skill sets of playwright, neurosurgeon, and AI researcher are clearly identifiable and distinguishable from one another, even if at first perhaps difficult to articulate and measure, so the skill sets of the executive and high-potential manager are clearly discernible, if perhaps even more difficult to articulate and measure. Unlike the skill sets of specialists, which are often densely packed around one core set of tasks, the executive skill set is broadly distributed and its mapping must hence distinguish between cognitive and non-cognitive skills on one hand and individual and relational skills on the other.

Cognitive skills: Functional. The skills associated with the standard models, methods, and languages of business that are operative in different functions of a company are both a set of *representations* (e.g., a model of an industry as a set of profit maximizing agents; of behavior as a set of choices guided by a value maximization principle; of an organization as a nexus of formal and informal contracts among self-interested principals and agents; of an investment as a set of potentially stochastic inflows and outflows, etc.) and a set of *methods* (e.g., for valuing European call options and other derivatives; mapping a set of cash flows onto an income statement and balance sheet; inferring from a multivariate data set the effects of a new organizational effectiveness program relative to such programs in other companies and industries; developing a bottom-up demand

analysis for a new product based on an understanding of demographics, demand characteristics, and the competitive/cooperative landscape of buyers and sellers offering complements and substitutes). They may be thought of as the "technical skills" imparted by a well-rounded MBA curriculum or one of the increasingly popular "MBA alternatives" seeking to tool up high achievers across the spectrum of disciplines and vocations with a repertoire of "managerial" or "business" skills.

The professional education courses, certificates, diplomas, and nano-, pico-, and femto-degrees proffered by distributed, online, and blended alternative business education—"Digital Marketing," "Project Management," "Financial Risk Management," "Big Data Techniques for Database Design," and so forth—read like an extension of precisely this set of "applied cognitive skills." All entail ***the*** sort of simple combination of know-what (models) and know-how (methods) characteristic of our "basic cognitive skills" category.

Cognitive skills: Meta-skills. Chester Barnard's field-defining *Functions of the Executive* (1938) was the genesis of growing awareness that leadership, high-level management, and the exercise of executive functions rely on a set of skills and abilities beyond mere functional expertise. Progress in articulating these skills had to await the development of distinctions and models of generalized problem definition and awareness of the specific difficulties of problem solving in unstructured, ambiguous, complicated domains involving multiple stakeholders with different, sometimes conflicting interests and commitments (see, for example, Simon (1973) on ill-structured problems; Churchman (1967) on wicked problems; Moldoveanu and Leclerc (2015) on ill-defined problems and problems in different computational complexity classes).

Not all business problems are created equal, and the difference is not merely of degree of difficulty; there is a difference of kind and quality between solving a classifier design problem in an artificial intelligence lab and heading up a large group of heterogeneous AI researchers with different theoretical and cultural backgrounds who are charged with developing a beta-ready release of an app that translates spoken

Mandarin to written English in quasi-real time or between conducting a market analysis for the launch of a new enhanced-reality headband and getting a group of marketers, engineers, and financiers to agree on the right set of assumptions underlying the analysis. It is through such distinctions that we can tease out the set of "higher level" cognitive skills accomplished executives exercise to build new models and methods that optimally recombine and integrate across multiple functions, and define and structure problems in ways that are intelligible and ultimately agreeable to multiple stakeholders who previously could not speak to one another, and had they been able to, would have vehemently disagreed.

The VUCA-specific significance of these skills receives strong support from studies like IBM's Global Chief Executive Officer survey, which concluded from the input of the 1,500 CEOs who participated that "rapid escalation of complexity is the biggest challenge confronting [the world's public and private sector leaders]." (Palmisano, 2010). The study further found that more than half of those surveyed doubted their ability to manage the anticipated rise in the complexity of the chief executive's predicament. On the positive side, managing the complexity of business predicaments emerges as a core characteristic of more successful executives and organizations.

Non-cognitive skills: Affective and perceptual. The 1990s were dubbed the "decade of the brain," but could more aptly have been termed the "decade of affect." Peter Salovey's (1990) articulation of "affective skill" was popularized by Daniel Goleman (1995) using the term "emotional intelligence." We are now accustomed to speak of emotional intelligence as of a skill or set of skills as well defined, measurable, and observable as IQ or analytical reasoning, though the real challenge of measurement and observation lies not in the past, but in the future. The term has nevertheless come to stand for a set of previously more nebulous "people skills" that are an essential part of the executive skill set.

Exploiting advances in affective and cognitive neuroscience to further elaborate these skills, we can characterize the emotionally ***intelligent*** executive as possessing a

comparative advantage in the exercise of skills like making reliably valid inferences about others' intentions from observations of their verbal and non-verbal behavior (empathic accuracy, enhanced "theory of mind" functions), changing affective states and moods in response to the context, content, and constraints of a situation (e.g., "being angry at the right person at the right time for the right reason in the right way," a venerable Aristotelian ideal), and exhibiting openness to understanding and validating alternative and often opposing emotional commitments and attitudes. Solving "wicked problems," it turns out, is not a merely cognitive function; heart and mind must work together to make progress in solving problems that involve the hearts and minds of others. Observed an executive at Farmers Insurance: "We think about how we can train people in empathy. Understanding that customers call an insurance company when they have a loss gives us the opportunity to prepare our people, beforehand, to be more responsive and sympathetic."

Non-cognitive skills: Self-command, self-control, self-regulation, and the X-skills. Heckman's (Cunha et al., 2006; Heckman, 2006) investigations of the relative lifetime value of various skills brought econometric rigor to a set of findings related to the value of self-control, self-command, and self-regulation, a nexus of skills appropriately, if somewhat confusingly, labeled "executive functions of the mind-brain," which have been percolating since Mischel's finding (1974; 1989) that 3-to-4-year-old children's ability to suppress temptation is highly predictive of their success in high school and college, after controlling for IQ or general intelligence.

Perhaps surprisingly, the tightest formulation of the "executive functions of the brain," the one most relevant to executives, is provided by Stuss (2011), whose work on the clinical management of neurodegenerative conditions (***Alzheimer's***, dementia) distinguishes among functions of the frontal lobes of the brain that have to do with the energization of different tasks and subtasks (do-THIS-now), partitioning of large problems into manageable tasks and objectives and allocation of tasks and objectives to different, sub-problems (do-THIS-first), and suppression of temptation and unconstructive impulses when engaging in a wide array of tasks (do-THAT-not-THIS).

Self-awareness can also be considered a relevant executive skill rather than attribute or characteristic, particularly in view of recent discoveries of its relationship to an *interoceptive* function of the mind-brain that enables an individual to successfully answer questions like "How am I feeling now?" To avoid the confusion that arises when we speak of these skills as "executive-related functions of the executive's brain," we henceforward term the self-awareness-self-command-self-control-self-regulation nexus X-skills, in part as a nod to Leibenstein's model of X-inefficiency within a firm (1976), being the inefficiency that arises from an imperfection at the firm level with respect to optimally allocating resources to tasks in the face of competing goals and under time constraints.

However self-evident to executives and their coaches and advisors, the X-skill nexus has, to date, not been explicitly included in the executive skill set. In part, this reflects an education field-wide bias regarding the link between self-discipline and factors outside the control of the higher education system (e.g., genetics, "personality," early childhood development), in part, perhaps, absence of the skill among educators. Executive education must come to grips with the importance of this skill set and its relevance to the executive function as well as the possibility that it may be learned, developed, and, at the very least, rigorously selected for.

Individual skills versus relational skills. Some cognitive skills are exercised privately, in the confines of office or cubicle, others publicly, in the context of high stakes board, client, or management team meetings. The same holds for affective skills, some (e.g., affective flexibility, X-factor skills) exercisable in an individual or relational setting, others (e.g., empathic accuracy) only in an interpersonal setting. The value of the relational skills needed to solve ill-defined, ill-structured problems in socially and culturally embedded, multi-stakeholder situations seems thus far to be recognized only in the labor market (Johnson, Manyka and Lee, 2005). The distinction between relational and individual skills, when it becomes more widely recognized, will have deep implications for the design of executive development experiences. Relational skills are likely to be

developed in heavily, densely, and richly socialized learning experiences and programs, individualized skills in relatively more remote settings.

Not only answers, but questions about skill ***development*** outcome measures for executive programs have proved elusive to date. Questions like "What kinds of skills are missing and what is their expected value?" "What kinds of skills are being developed in newer programs, and how are they being developed?" and "How can we measure the degree to which skills are acquired and transferred to the workplace?" will be assembled in these pages into a chief learning officer's compass for executive development.

Equally important to executive program designers is an understanding of how skills are *acquired* and *applied*. To yield a return on investment, new skills must not only be acquired but also applied in the context of the organization that invests in their development. Skill development thus needs to satisfy the following equation.

SKILL DEVELOPMENT = SKILL ACQUISITION + SKILL TRANSFER

To be effective, executive programs must address both elements of the right-hand side of this equation: participants should acquire new and useful skills that should transfer to the work they do within their organizations. Neither acquisition nor transfer can be taken for granted, as we shall see below.

Skill Acquisition: **The Differences That Make a Difference**

Just as we employed key distinctions to illuminate the landscape of useful executive skills, we make sense of how skills are acquired by way of another pair of distinctions.

Algorithmic skills versus non-algorithmic skills**.** The first distinction is that between algorithmic and non-algorithmic skills (Moldoveanu and Martin, 2008). The nature of a skill that relates to the ability to perform a task will reflect the nature of that task. If its execution can be written as an algorithm, that is, a step-by-step procedure like a recipe or computer program, a task is algorithmic. To perform an algorithmic task that

solves a specific problem requires an algorithmic skill. Examples include basic calculations in finance and accounting or in the microeconomics of consumer behavior and computation of Nash Equilibria in strategic form games.

Other processes do not admit of algorithmic description, such as "creating a welcoming, open communication environment," "conceptualizing a predicament that is acceptable to multiple parties initially at odds," and "credibly and publicly taking responsibility for an error." Whereas most algorithmic skills are cognitive, some affective skills (e.g., altering breathing patterns in predictable ways in order to quiet the mind) are algorithmic in nature.

This distinction is critical to how skills are construed and learned. Algorithmic skills are more readily "digitized" and thereafter amenable to online, distributed instruction that follows the basic schema: see it done, try to do it (with step-by-step feedback), do it yourself (with outcome and output measures). As evidenced by the success of Lynda.com as a learning vehicle for basic tools and techniques ranging from video editing to cooking and low-level programming to Web design, a large class of task-related skills can be remotely specified and tested.

Development of non-algorithmic skills typically proceeds with rich, textured, and subtle feedback and constant dialogue between learner and learning facilitator. "Presence" in interpersonal communications and "attunement" to the emotional states of others, for instance, are usually viewed as leadership skills best developed in the context of a coaching relationship replete with feedback. Coaches may employ a "method," but neither coach nor participant can specify an algorithm for getting to presence or attunement. Their acquisition being highly dependent on close contact and interaction, such skills are unlikely to be absorbed into the digital world of online learning. An executive at a mobile technology company characterized algorithmic skills the development of which can be deployed on a broad, global scale as "low-touch" and non-algorithmic skills peculiar to senior leaders that require greater focus on developing plans, individual and group coaching, and customized approaches as "high-touch."

To imagine that, because algorithms abound in their conceptual repertoire and field of practice, domains of executive work like managing with big data analytics (to take an example in vogue today) rely on a purely algorithmic skill set would be a mistake. A componential analysis of the skills required in large-scale business optimization and prospecting projects that employ big data analytics (Moldoveanu, 2015) finds algorithmic skills like model testing, calibration selection, and coding, and a select set of database design and optimization skills, to be complemented by non-algorithmic skills like relating, persuading, sensing, structuring, and presenting (**Figure 1.4**).

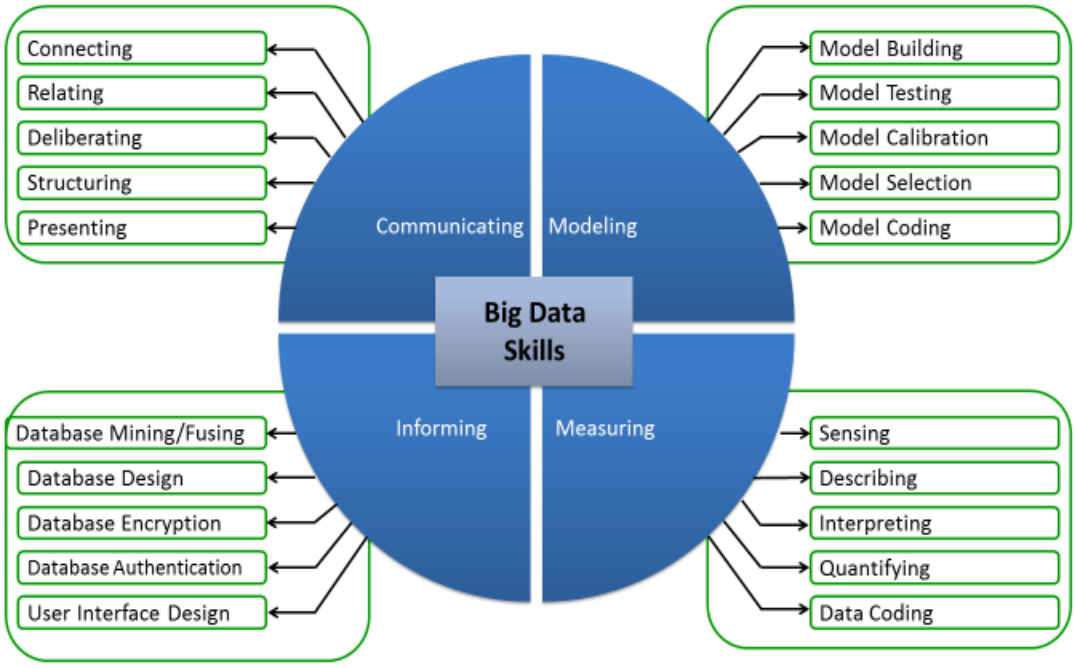

Figure 1.4. The Managing with Big Data Skill Set. (Source: Moldoveanu, 2015.)

Always-teachable skills versus only-learnable skills. Not all skills are teachable, and it may be that not all skills are learnable, but there are important skills that are learnable but not teachable. It is important to distinguish between skills than can be taught and learned and skills that can only be learned, sometimes with facilitation and feedback,

but never via specific codified instruction. Riding a bicycle is a classic example of an important, valuable skill that cannot be taught by having the uninitiated owner read a manual or set of instructions. Competence at this skill is built through a delicate interplay of perception (gaze control, feedback/feed-forward balance signals), movement (arms, legs, torso, hips), and predictive processes (hill/valley coming) that produce synchrony and synergy. Not surprisingly, the skill is taught to eager children by loving, attentive, patient parents and siblings, who rely on frequent demonstration and intense, gentle feedback.

"Giving effective face-to-face negative ***feedback***" is a similar kind of skill highly relevant to executive learners. Like riding a bike, it cannot be "taught" using a set of methods composed of the usual suspects. But it can be learned under the patient guidance of a savvy coach or guru able to guide the learner to a "better approach," "better" being defined in terms not only of "more soothing" or "less offensive" or "more informative," but also of fit with the learner's style and "way of being." Of course, some skills currently only learnable can become teachable, and that is the role of pedagogical innovation. (**Figure 1.5**).

Figure 1.5. Swimming Lessons With No Pool ("I remember my father once told me, you would never learn swimming if you stay on the land…" (Source: http://flipopular.com/shocking-historical-photos-you-shouldnt-miss/4/, accessed February 2016.)

The difference this distinction makes to the design of executive programs is simple: teachable skills can be imparted via offerings that incorporate teacher and student roles; skills that can only be learned but not taught entail the development of a learning environment that affords participants an appropriate combination of guidance, autonomy, and support conveyed by a process that tends to be amorphous and difficult to specify or choreograph.

The algorithmic/non-algorithmic and always teachable/only-learnable distinctions not only illuminate the process of skill acquisition but also explain to a considerable extent the dynamics of the executive program industry. Diverting acquisition of algorithmic skills, especially of the sort that are always teachable, to the digital cloud frees the face-to-face and in-person classroom medium to specialize in the more intensive and costly cultivation of non-algorithmic skills, especially the sort that are not teachable.

Recalling that skill acquisition is just part of the skill development equation—SKILL DEVELOPMENT = SKILL ACQUISITION + SKILL TRANSFER—we turn now to the other element: application in the context of the workplace.

The Elusive Goal of Skill Transfer

That skills, however acquired, will be usefully applied is implicitly assumed by all educational processes and institutions from kindergarten to doctoral programs, open online courses to informal seminars and workshops, and coaching sessions to on-demand corporate training sessions. The critical outcome measure of learning is the transfer of a skill acquired by a student, trainee, or participant to the context in which it is useful. The efficacy of skill transfer can be gauged by the answers to questions like:

Is a sales team manager who has been taught the basic principles of incentive-based compensation systems applying them to the design of the team's compensation package?

Is a student who has been taught basic methods of cash flow management applying the learned recipes and heuristics to the management of household cash inflows and outflows?

Do those who develop—as a group, in a highly socialized setting within the precincts of the executive training suite of a leading business school—a heightened awareness of the emotional landscape of an outcome-focused group meeting successfully export this awareness to the management of meetings in their respective organizations? Does it matter to the success of the skill transfer if the context is South Korea and discussions are conducted in Korean? Is the skill transfer limited to groups that are equivalent in size to the training group?

Does reasoned, informed, structured discussion of the strategic predicament that faced Dropbox's founders upon receiving series A financing dispose discussants to apply the structuration schemata used by the discussion lead and dialogical ability developed via a good case discussion to the deliberations in which they will engage when they launch their own companies?

What if those companies are a large retail organization, car parts manufacturer, or pharmaceutical company? Will what is learned from a case discussion of Dropbox apply in those settings, or does equivalent awareness have to be developed in case discussions of companies in *those* industries?

More pessimistically, might the radical difference between the "make believe," "civilized" setting of the executive classroom and the "reality-laden," "messy," "political" setting of the corporate suite preclude the transfer of any skills developed in case discussions beyond the boundaries of the executive classroom?

Do skills* transfer*? Which is to say, does one* truly *learn? Given its centrality to executive development programs, the assumption of skill transfer warrants particular scrutiny. Skill transfer, in particular, the transfer of basic and largely cognitive skills, has been central to cognitive psychology, learning science, educational psychology, and, more recently, the brain science of learning and adaptive behavior. Yet the subject and discipline of skill transfer have received little attention or emphasis in writings on executive and professional education or the design of professional and executive education programs, for reasons that will shortly become apparent.

Seminal work on skill transfer in education dates to Thorndike's 25-year inquiry into supporting conditions and mechanisms, and ***implications*** for the nature of education, of skill transfer (Thorndike and Woodworth, 1901). Thorndike's original work tested an extremely simple case of skill transfer. He had students learn to estimate the area of a large rectangle (123 x 221 blocks, for instance) by tessellating it with smaller rectangles (20 x 20; 10 x 10; 5 x 5; 1 x 1) provided as a set of building blocks. He found that over repeated attempts students produced tighter estimates of the area of the larger rectangles, but that this ability did *not* transfer to a problem in which the rectangles were replaced by triangles, in which error rates of students in the experimental and control groups were barely distinguishable. Thorndike consequently concluded that "improvements in any single mental function rarely bring about equal improvements in any other function, no matter how similar."

More textured versions of Thorndike's transfer tests (Reed, Dempster and Ettinger, 1985) distinguished a problem's textual context from its underlying structure while maintaining the same general solution principle. A target problem was modified in several ways.

Target problem: A small pipe can fill an oil tank in 12 hours and a large one can fill it in 8 hours. How long will it take to fill the tank if both pipes are used at the same time?

This problem was modified as follows.

a. **An equivalent problem—same imagery, same structure**: A small hose can fill a swimming pool in 6 hours and a large one can fill it in 3 hours. How long will it take to fill the pool with both hoses?
b. **A similar problem—same imagery, different structure**: A small pipe can fill a water tank in 20 hours and a large pipe can fill it in 15 hours. Water is drawn from the tank at a rate that would empty a full tank in 40 hours. Suppose both pipes are on and water is drawn from the tank. How long would it take to fill the tank?
c. **An isomorphic problem—different imagery, same structure**: Tom can drive to Bill's house in 4 hours and Bill can drive to Tom's house in 3 hours. Assuming they use the same route, how long will it take them to meet along the way if they both leave their houses at the same time and drive toward each other?
d. **An unrelated problem—different imagery, different structure**: An airplane can fly from city A to city B at an average speed of 250 mph in 3 hours less time than it takes it to return from city B to city A at 200 mph. How many hours did it take it to return?

The experimenters found that students could transfer solution procedures learned from the target problem to equivalent, but not to isomorphic, unrelated, or *even similar* problems (Reed, Dempster and Ettinger, 1985). This finding suggests that skill transfer relies on a level of specificity in both the context in which a problem is solved (a case of price competition in the soft drink industry) and that to which the solution is transferred (imminent price competition in the bottled drinks industry, with slightly different numbers), and on the similarity between them. This flies in the face of the notion that education provides anything resembling a "lifetime skill set" and speaks to the importance of maintaining a set of teaching materials and instructional cases sufficiently updated that the target problem (the one that informs a case discussion) is never far (in

structure *or* imagery) from the modified problems to which participants are expected to transfer the learned skill. (Unfortunately, as we shall see below, the case of executive education involves additional dimensions of skill transfer not solved by merely maintaining an updated set of teaching materials.)

Such findings, subsequently reproduced across a large number of problem situations, influenced Thorndike's pessimistic view of education as an unsuccessful attempt to transfer a set of higher level skills and principles across different situations and contexts and buttressed a retreat to a view that education should teach students, in the words of Detterman (1993), not "how they need to go about applying the knowledge" or "how they need to know," but "what" they need to know.

The implication for executive training today of the notion of "education as imprinting of facts" is, if anything, even more profound than it might have seemed to educators and psychologists working post-Thorndike. An undisputed characteristic of the Web in its present embodiment is the complete commodification of information and knowledge. If the primary and most important function of education is to transfer information and knowledge (the latter being rules for applying the former to specialized, context-dependent problems), organizations worldwide should immediately re-target their current $130 billion (USD: 2015) investment in corporate training entirely to online platforms that codify and convey information as needed by each manager.

Traditional pre-Web 2.0 educators and learning scientists troubled by the failure of attempts at skill transfer throughout the past century have produced a large body of empirical studies aimed at elucidating specific conditions under which transfer takes place (or not), and the mediators and moderators of skill transfer over the learner's life cycle. Skill transfer, it turns out, *does* take place, in some situations, for some skills, for some people, with some probability, and conditional upon some combination of factors that have to do with trainer, trainee, subject matter, specific skill, and learning context.

Sternberg and Frensch (1993) propose that the transfer of a skill (e.g., a cash flow management method) has to do with its being remembered and applied in situations in which it is useful (e.g., a division's cash flow planning). This suggests several factors that influence skill transfer:

a. The way a learner encodes conveyed information (as names, numbers, symbols, or associations) matters a great deal to when, where, and how it will be remembered (Tulving and Thomson, 1973), and hence to which contexts the skill will be transferable. In a paradigmatic experiment, students exhibited enhanced ability to apply heuristics and methods of manipulating algebraic expressions learned in algebra class in a physics class, but learning the same methods in the physics class did not enhance students' ability to solve "identical" problems in algebra class (Bassok and Holyoak, 1989).
b. The way information is organized at the time of learning influences whether or not it is recalled at the right time and place and for the right reason (Tulving, 1966). Lists of seven-digit numbers that exhibit symmetries (456-7654) used to encode them are more likely to be remembered than numbers that lack symmetries or possess symmetries hidden from the learner.
c. Contextual triggers and mental frames often determine information's relevance to context, which, in turn, determines the degree to which it is productively recalled (Anderson and Bower, 1973; Luchins, 1942). Viewed as a "supply chain optimization" problem, dealing on a busy Monday morning with urgent phone calls from suppliers, the engineering team, and the production team relies on specific associations of callers' names and roles with the components of a supply chain that were learned in an operations management class.

Distinctions like these may be music to the ears of empiricists, who can justifiably continue to look for ever more complicated conjunctions of causes, mediators, moderators, and effects, but entail stark practical choices for designers of executive education programs, as between aiming for "higher immediate relevance of a skill" in

order to enhance its transferability via contextual and framing effects and striving to transfer knowledge at the highest possible level of abstraction so as to exploit encoding effects and maximize transferability to a large number of specific situations, or between strict pre-organization of material to achieve a higher probability of recall, and employing large numbers of wide ranging and not readily categorized examples across a range of industries to maximize contextual triggers. Not only do we not know the answers to such questions, but professional and executive education have not even begun to ask them.

Transfer of executive skill is even harder to capture. Much more than how information is organized matters to whether and how it is transferred. How subject matter is represented and taught (case discussions, lectures, small workshops, guided online sessions), the specificity of participants' skill development goals (learning *what* versus learning *how to*; learning to *do* something versus learning to *be* a certain way towards others), and the combinatorial interaction between context and content (learning to act or speak or communicate differently in specific cultural, hierarchical, political, technological, and geographical contexts) all deeply influence the success of an executive learning program participant's "personal learning project."

Providers of executive learning and development experiences must attend not only to how information and knowledge structures are presented and discussed, but also to the modality of presentation, time value of the skills ***being*** taught, differences in the functional, social, and temporal contexts of use, and difficulty of articulating and measuring the skills to be developed and of transferring them to participants of varying ability whose backgrounds reflect a wide range of contexts.

Barnett and Ceci's (2002) typology of the "differences that make a difference" in skill transfer and expected difficulty of transferring any particular skill has proven useful in the design of new educational experiences (as of the pedagogical platform of the Minerva Project), and can, with modifications, shed light on the skill-development value of different forms of executive learning and corporate training. The anticipated difficulty of transferring a skill is represented as a "near-far" problem, entailing, at one end of the

spectrum, the transfer of a skill from one context or modality to another highly similar in context and content.

Learning to solve mass conservation problems involving two specific bodies in physics, for example, should transfer "easily" to solving problems that involve two bodies of different masses (near transfer), but may not transfer as easily to problems involving three bodies (farther), N bodies (farther still), inviscid fluids (even farther), or relativistic masses (much farther). Mapping the wine industry as a value-linked activity chain involving exchanges of goods, services, and money to reveal the value-added and likely bargaining power of each participant, to take an example from short strategy executive courses, will likely transfer easily to an analysis of the maple syrup business (near transfer), but not transfer as easily to an analysis of the blood plasma and derivative pharmaceuticals business (farther), telecommunications semiconductor business (farther still), video game graphics engine business (even farther), or business of using high-powered computational devices to dig for new Bitcoins (much farther).

Transfer may thus be nearer or farther in terms of the "knowledge domain" in which a learned skill is to be applied. Knowledge domains more similar to those in which a skill is learned will present less challenging ("near transfer") environments, whereas a program that claims to add "lifetime value" must ensure that a learned skill can be applied in many highly different ("far transfer") knowledge domains.

Relevance is key, but not related to content alone. Content may be organized, encoded, presented, and instrumented so as to be maximally likely to trigger an executive's mind, that is, be maximally "close" to most of the knowledge domains in which the executive operates, and skill transfer still fail to occur. This is because the near-far distinction operates not only in the knowledge domain, but in other domains relevant to the transfer of learning as well (Barnett and Ceci, 2002).

Physical context relates to the transfer of a skill to tasks performed near (different classroom, same school or organization) or far (different school or different facilities of

same organization). Physical context can be an important determinant of an executive's ability to exercise a new skill. New modes of communication and expression, for instance, may be highly dependent on the topology of the space in which they are employed (e.g., small room versus classroom versus large hall).

Social context relates to the transfer of a skill to tasks performed in social settings that differ from those in which the skill was learned. *Is* the skill to be transferred, for example, from a focal group of managers in the same enterprise engaged in a joint seminar to one manager's team or working group (near) or to a team in a different company (far)?

Functional context relates to the transfer of a skill to settings in which its function is different. A case discussion of, for example, the choice of a new *database* technology minimally teaches discussants to frame managerial and executive situations as problems and dilemmas that can be addressed using particular methods and techniques. The function of this skill in the executive learning classroom is to enable the discussant to participate in a high-level, disciplined dialogue with peers about the case at hand. Will the skill transfer when the functional context changes, when the objective is, for example, to generate new database solutions, evaluate alternative solutions, or engender idle, conceptual conversation aimed at concealing glaring errors of fact and analysis?

Temporal context relates to the transfer of a skill to contexts near or remote in time. It is a measure of the "extinction rate" of a newly acquired skill. College students' cognitive mastery of subject matter is known to "peak" around the time of the final exam and rapidly diminish thereafter. Executive skills' usefulness, however, is highly correlated with longevity, that is, with how habitual their exercise becomes.

Modality involves the "near-far" distinction with *respect* to differences in how a skill is learned (e.g., online, through low-bandwidth interactions between participants) and applied (e.g., in teams and groups, in heavily socialized settings, in an emotional landscape colored by political and economic interests and the moods and desires of group members).

Relevance is a six-dimensional entity! References to "useful, applicable, relevant knowledge" when communicating about executive learning programs can now be seen to be a misleading oversimplification.

First, what is to be developed and imparted is not "knowledge"—Google Search, Scholar, and Tensor Flow, Wolphram Alpha, and Wikipedia are all faster, better, cheaper substitutes—but rather know-how or *skill*.

Second, relevance is not a simple metric, but a six-dimension measure (see **Figure 1.6**) that captures the probability that a skill will be applied in contexts semantically, physically, socially, functionally, temporally, and modally different from those in which the skill was learned.

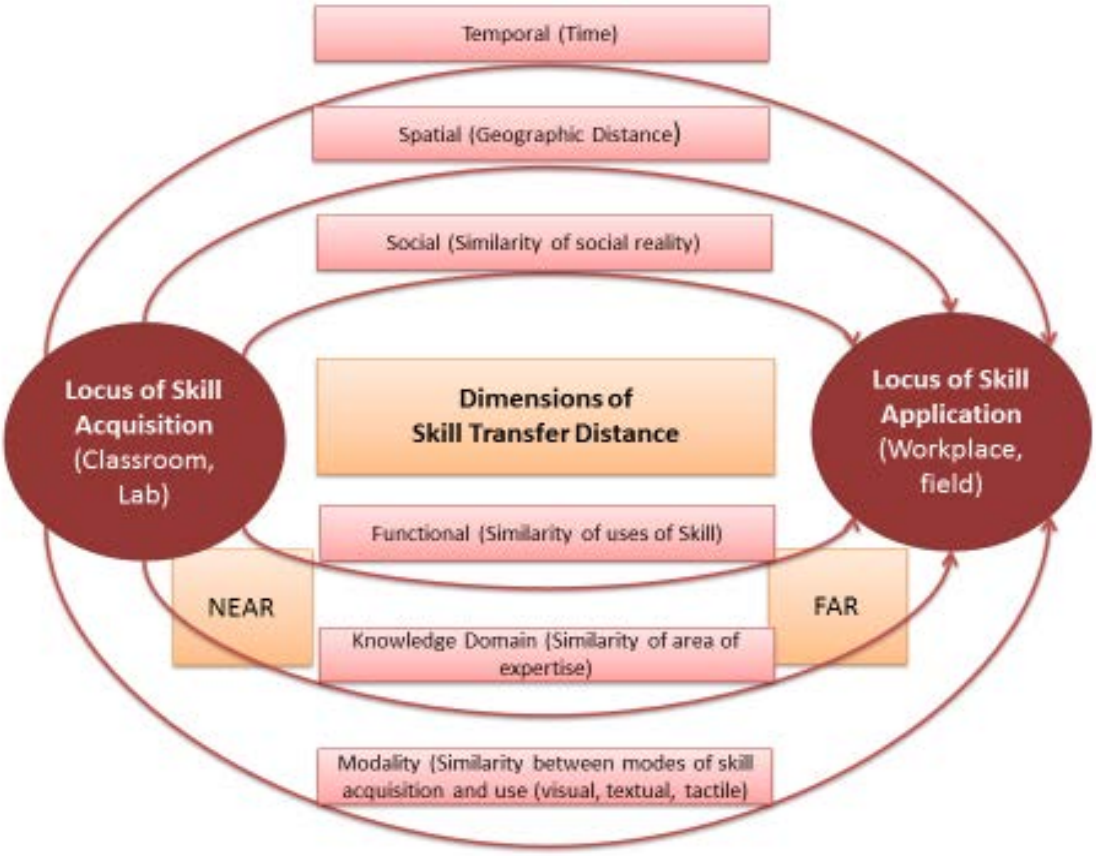

Figure 1.6 The "Near-Far" Challenge of Transferring Skill from the Locus of

Acquisition to the Locus of Application: "Distance" Has (At Least) Six Separate Dimensions! (Source: authors.)

Imagine a designer for the entire executive education ***industry*** (leaving aside the reality of current incumbents and industry structure) armed with the foregoing empirical analysis and motivated by a desire to create the optimal skill development-regimen for executives using the gamut of learning and teaching technologies, techniques, teachers, coaches, and trainers. The six spaces in which the distance between the locus of learning and locus of application can be measured capture six dimensions of what it means for a skill to be "relevant," and suggest two ways in which executive learning providers can stay "true to advertising" in the quest to develop relevant skill sets for executive clients: (1) "make all transfer local—work on near transfer by decreasing transfer distance" (model I); and (2) "make learning transferrable to distant domains—work on far transfer by increasing the reliability of transfer."

Skills-on-Demand: Make All Skill Transfer Near Transfer

Discounting as too difficult and costly, and hence unlikely, the prospect and ideal of far transfer—of skills imparted to executive clients on campus, in person, or within a group being applicable much later, in varying social, technical, professional, and physical surroundings and via different modes of expression—will result in the deployment of Web 2.0 technologies of learning and interaction by large numbers of curators and facilitators working within their respective organizations to create a seamless fabric of executive learning opportunities that yield skills that are "relevant by design" (**Figure 1.7**). No longer will functional skills (e.g., "accounting," "strategy," "finance," "operations," "marketing") be taught independently from the specific context in which they are to be applied. Basic language systems and models and methods will be efficiently taught via online forums and learning management system platforms specially curated for organizations, or groups of organizations that require a specific capability, and the application of skill to the context in which it is useful individually and closely guided for each participant by internal coaches and functional experts. Participants will, by design,

see immediately the relevance to the problem at hand of each skill delivered by the learning platform, and elaborated by coaches, precisely when needed.

The relevance gap is closed by *making all skill transfer near transfer*. If and when individuals change industries, or roles within an organization, or organizations within the same industry, this distributed, low-cost, interactive "learning-on-demand" platform follows them like a personal learning assistant, living partly in the cloud and partly in their talent management group in the form of curators of content, facilitators of discussion, and local gurus who guide the application of content to context.

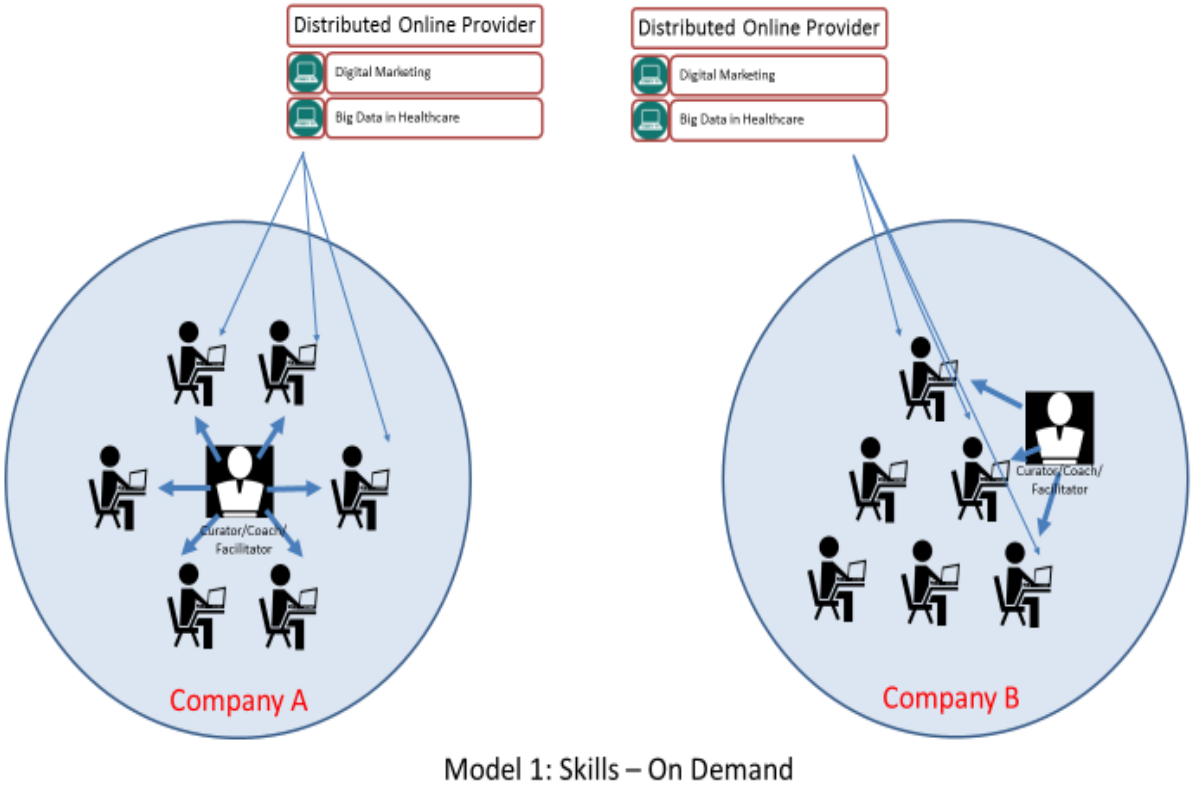

Figure 1.7: The Skills-on-Demand Model of Executive Development. (Source: authors.)

The Core Skill-Development Hub: **Teaching for Far Transfer and Facilitating Learning of the Unteachable**

Alternatively, the learning environment of executive development might be optimized to maximize the probability of long-lived relevance across the range of physical, professional, social, functional, and modal contexts of executives' professional and personal lives. To "teach in order to maximize far transfer" (**Figure 1.8**), core skill development programs would be designed using the techniques most likely to produce a reliably transferrable set of core skills and maximize the degree to which this skill set is robust to changes in the context in which executives will exercise them.

To cultivate a skill set sufficiently abstract to carry across industries and cultures, such a program would employ techniques like personalized and timely developmental feedback; collaborative construction of the substantive content of discussions; relentless practice in applying learned skills to a wide range of contexts and predicaments; cases and collaborative projects highly specific in terms of details of time, place, industry, market, and product or service; and classroom and seminar-hall learning focused on argumentation, managing constructive dialogue among people with potentially different views and aims, structuration of ill-defined predicaments and situations as well-defined problems with finite solution search spaces, iterated elimination of dominated solutions on the basis of sparse and noisy data, and so forth.

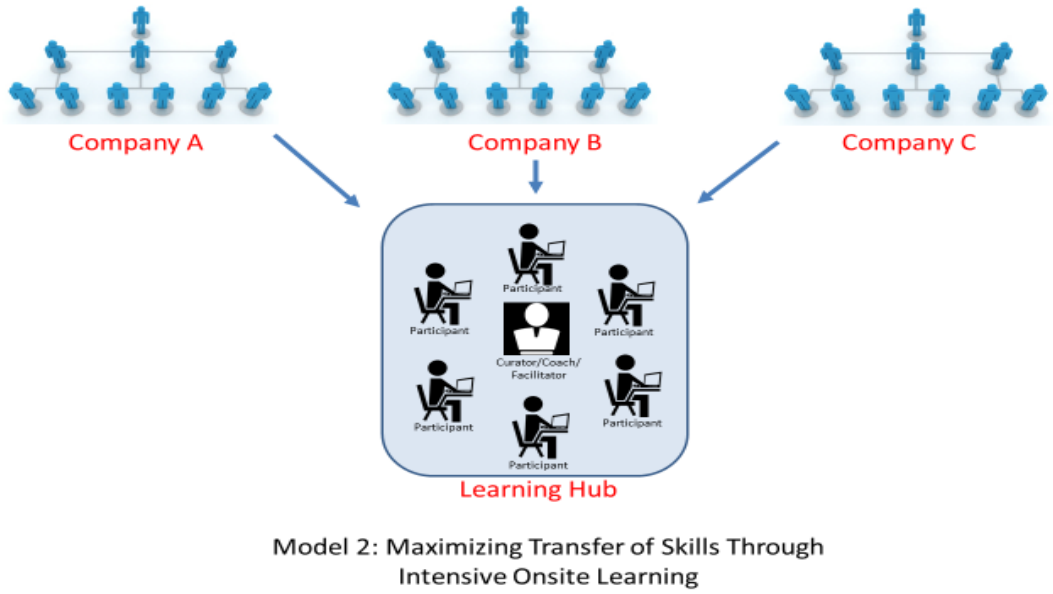

Figure 1.8. The Core Skill-Development Hub Model of Executive Learning. (Source: authors.)

The skills-on-demand model of executive learning possesses an overwhelming advantage in efficiency, especially with respect to the development of algorithmic skills and learning that bridge the gap between content and context through continuous availability and on-site customization and curation of content. The learning hub model of core executive-skill development has a significant advantage in the development of relatively less context-sensitive skills that are fundamentally relational, communicative, and non-algorithmic in nature. Skills that are difficult to articulate and translate into recipes benefit from high-end, focused, heavily social learning environments supported with constant reinforcement by savvy facilitators and motivated peers. Such environments accommodate co-creation of learners' personal learning maps and goals. Because not all learners, perhaps not even most, are aware of the skills they are trying to develop, the presence of learning facilitators who can help articulate core skill-development goals will be a key feature of the learning hub model.

If there is an optimal segmentation of the market for executive skills along the lines of achieving relevance by narrowing the content-context gap or increasing applicability across domains, of developing algorithmic and functional skills through distributed local learning environments and core skills through intensive on-campus learning experiences, all of which can be accomplished by two "corner" models, what, then, is left of the traditional classroom, a staple of executive education programs across geographies and cultures inherited from the about-to-be disrupted college and MBA programs worldwide?

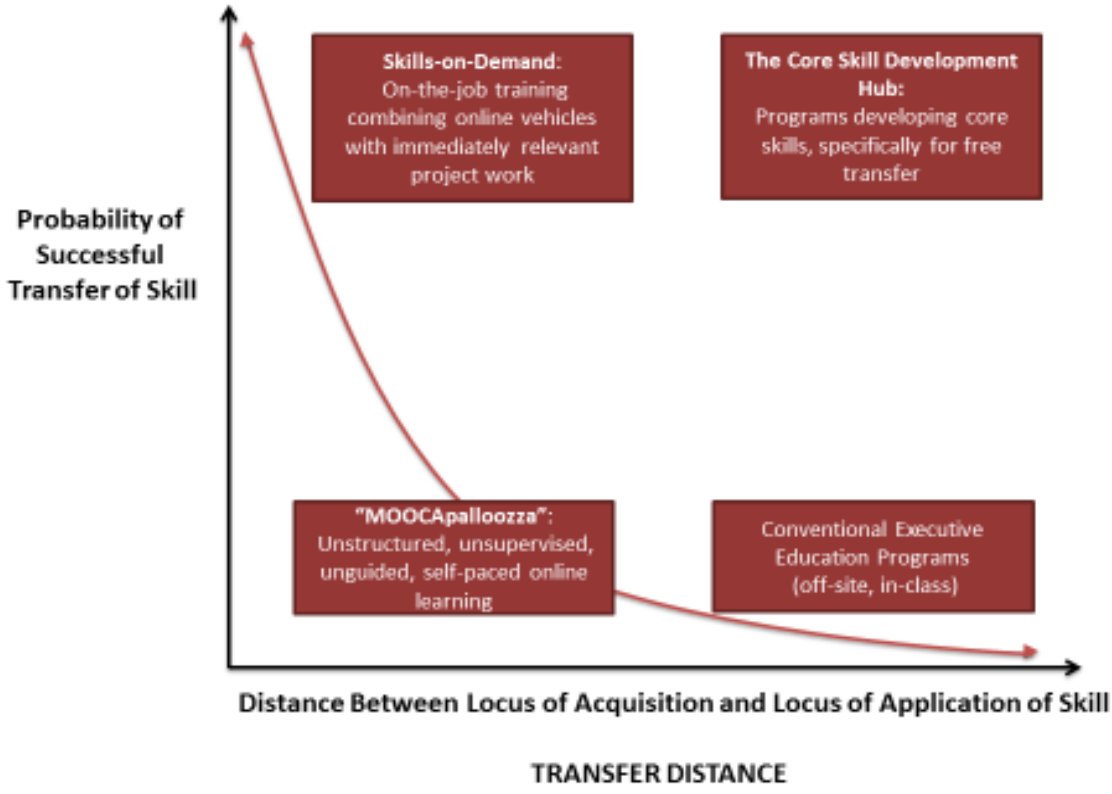

Figure 1.9 Mapping the Executive Learning Landscape through the Lens of the Near-Far Problem in Skill Transfer. (Source: authors.)

The situation is as pictured in **Figure 1.9.** As context moves away from locus and content, the case in traditional classrooms and other depersonalized learning environments, the ability to make learning relevant through proximity or deep

personalization is lost. As Ulrichs and Terwiesch (2014) correctly appreciate, the classroom star is eclipsed by the Internet (online) star, and rendered obsolete by the combination of online subject matter experts, whose presentations are curated and made relevant by local coaches, learning facilitators, and gurus residing, working, living, and breathing in the context in which content is delivered to learners.

As the marginal attraction of leaving home and office to participate in executive learning on the campuses of major providers of learning experiences decreases in proportion to the availability of a ubiquitous *personalized skill-development cloud*, competition among providers will increasingly focus on developing the skills least susceptible to digital distributed delivery in ways that are most likely to make them relevant to the greatest number of contexts, namely by designing *learning experiences specifically optimized for the transfer of precisely the skills one cannot "just teach*," the learning of which must be facilitated in an intensely personal environment.

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