FOREWORD

Peter Stokes's *Higher Education and Employability: New Models for Integrating Study and Work* is a timely and relevant work for anyone interested in the future of human capital development. In the early twenty-first century, economic growth and education scholars have begun to move beyond the concepts of an industrial or knowledge economy toward that of a learning economy—a society in which the capability to learn is critical to the economic success of individuals, firms, regions, and national economies.[1] In a learning economy, the linear relationship between formal higher education and learning in the workplace is becoming obsolete, and this transition is creating pressure for research universities and employers to integrate knowledge creation with job creation and academic teaching with applied learning in order to create sustainable human capital development systems that promote individual competence, business innovation, and global competitiveness. This move requires a deep integration of study and work that redefines the relationship between colleges and universities and employers and new forms of partnership to encompass it. Through the lens of employability, Stokes outlines this new ecosystem of learning partnerships that embrace the learning economy

paradigm and provides a guide to emergent best practice and organizational transformation for both employers and higher education institutions.

EDUCATION AND HUMAN CAPITAL DEVELOPMENT

In their landmark 2010 book *The Race Between Education and Technology,* economists Lawrence F. Katz and Claudia Goldin document the rise of the United States as an economic powerhouse and the catalytic role education played in the process.[2] Through econometric modeling, the authors demonstrate that for any given decade in the twentieth century the increasing education attainment of successive age cohorts accounted for 25–30 percent of GDP growth. They conclude that if the twentieth century was "the American Century," then this exceptionalism was almost certainly driven by human capital development.

Katz and Goldin view human capital development largely through the lens of the emergence and evolution of public schooling, the key highlights of which include the common school (elementary and middle school) movement (1840–1860), the high school movement (1910–1940), and the shift to mass college education (1950–). They contend that from the mid–nineteenth century to today, the United States has led the world in creating the platforms for successive levels of human capital development: "By the early 20th Century America educated its youth to a far greater extent than did most, if not every, European country. Secondary schools in America were free and generally accessible, whereas they were costly and often inaccessible in Europe. Even in the 1930s America was virtually alone in providing universally free and accessible public schools. The United States expanded its lead in education in the 20th Century by instituting mass secondary schooling

and then establishing a flexible and multifaceted higher education system."[3]

Goldin and Katz characterize the beginnings of these movements as highly varied, grassroots efforts based on several pillars: public funding, public provision, local decentralization, separation of church and state, gender neutrality, and open and forgiving access. In other words, while we take our (public) K–12 and higher education systems for granted, they emerged from an ecosystem of local interests and trial and error to become a more or less interconnected, effective system that helps the nation develop human capital—citizens, entrepreneurs, workers, public leaders, parents. And as we move deeper into the twenty-first century, we need to educate ever more citizens to postsecondary levels as a means to prepare them for economic opportunity and competitiveness in the learning economy.

Higher Education and Employability is a significant addition to the growing body of literature on the practical realities of educating individuals for success in the global learning and innovation economy, specifically focusing on the role of research universities. Stokes's use of the concept of employability as a bridge between higher education as an academic enterprise and employers facilitated by the emergence of an ecosystem of organizations that help integrate formal learning into practical life and work is valuable on two fronts. First, the employability concept helps mend the artificial divide between vocational and academic learning that evolved with the industrial economy. Second, by unbundling needs and services embedded in the employability concept, Stokes frames an ecosystem for integrating work and learning to help us better understand how component pieces may evolve into new partnerships and business models. So as Goldin and Katz helped us understand the chaotic evolution of public education in the United States,

Stokes helps us understand the importance of integrating study and work.

EMPLOYABILITY—A BRIDGE BETWEEN ACADEMIC AND VOCATIONAL LEARNING

Employability means different things to different people. In the case of the dialogue between higher education institutions and employers about necessary knowledge and skills, these different meanings often devolve into hardened positions on education versus training or on people as human beings not just workers. Thus, Stokes wisely avoids creating a hard-and-fast definition. Rather, by unpacking the ecosystem of tools and services emerging at the intersection of universities and employers, he turns employability into a conceptual bridge that integrates academic and vocational/applied learning within a twenty-first-century understanding of human capital development. This is most useful, because being free of industrial-era notions of human capital development is a key step in allowing for new practices, tools, and partnerships to emerge and in helping the nation reclaim its lead in human capital development.

Stokes's research university case studies—Georgia Institute of Technology, New York University (NYU), and Northeastern University—each model this freedom. They purposefully exist at the nexus between academic and professional knowledge and skills development and the flow of talent into the global workforce. Stokes's description of NYU's vision for itself reflects this thinking: it is first and foremost an urban institution and increasingly a global institution that is bringing a compelling value proposition to a set of world markets by combining a deep commitment to the liberal arts and academic research with a pragmatic and long-standing focus on

professional education. These institutions stand out as exemplars of the employability ecosystem that integrates study and work through employer and university partnerships. Yet, to fully understand their importance to the evolution of higher education, we must delve deeper to the roots of the academic–vocational education divide.

The emergence of the industrial, mass production economy forms the broader context from which the early education movements sprang. Paradoxically, while the industrial economy made clear the need to provide broad-based education, it also introduced a growing distinction between academic and vocational learning. In the first half of the twentieth century, as automation and assembly lines increasingly drove production and competitive advantage, workers came to be perceived as needing only the skills necessary to follow rules and the machine systems. Leaders, in contrast, needed higher-order thinking skills to manage companies growing in size and complexity.[4] This type of thinking was enshrined in Frederick Taylor's 1911 book *Principles of Scientific Management,* which emphasized breaking down production tasks to simplest rules so workers could follow them. As a result of this black-and-white demarcation of knowledge and skills, the idea of combining higher education, exemplified by the liberal arts, and training, demonstrated by vocational-professional curricula, became a nonstarter.

Further into the century human resource scholars moved beyond the simple workers "do" and leaders "think" framework to recognize a deeper architecture of knowledge in organizations that envisioned a portfolio of four knowledge areas and skills needed for an organization to thrive: general, job/occupation specific, firm/agency specific, and industry specific.[5] This new framework provided a tool for unpacking the evolution of roles in the higher education system. In light of the worker/leader

dichotomy, educational institutions grew up to provide different types of learning to these two distinct groups. Four-year colleges and universities provided general knowledge and high-level professional (industry) knowledge to managers. Community colleges, technical schools, and employers provided firm- and job-specific knowledge to workers. Thus, a myth that academic and vocational education must always be separate was embedded into higher education delivery systems. As important, employers' connections to higher education, to the extent they existed, were relegated to training-oriented programs.

In the twenty-first century, however, the competitive imperative to innovate products, services, and even business models has caused a democratization of the organizational knowledge and skills portfolio. For firms, the four knowledge areas are becoming more blurred, with frontline workers requiring more of the education traditionally reserved for managers and managers needing the frontline knowledge that allows for rapid prototyping in response to changing demand. For individual workers, managers, and entrepreneurs, the competitive imperative drives a need to be continuously building knowledge, skills, abilities, and networks in an increasingly dynamic labor market with many career changes and company start-ups. Further, the democratization of organizational knowledge and the acceleration of competition has been shortening the time window for human capital development. Employers are increasingly seeking individuals with both technical knowledge in their field and practical experience solving workplace problems. Of course, employers have always valued experience in more seasoned veterans; what is changing is the emphasis on applied problem-solving skills in newer workers. According to global competitiveness expert and Harvard Business School professor Michael Porter, "Competitive workers must have the

ability to apply academic or technical knowledge to solve real-world problems . . . and to work effectively with other people as customers, coworkers and supervisors."[6]

The research university employability ecosystem that Stokes lays out covers a broad landscape, from co-ops to academic courses, to career coaching, to job matching, to peer networks, to internships, and more. Georgia Tech's Design Expo uses actual industry challenges to create applied learning experiences for students in collaboration with industry partners. NYU leverages three global campuses and alumni to create internship and service opportunities with multinational corporations and foreign governments. Northeastern University offers the ALIGN program (Accelerated Link to Industry through Northeastern's Global Network) to provide a bridge to careers for new graduates or career changers through a hybrid of online courses and experiential learning opportunities.

In Stokes's employability ecosystem, the more university-centric models are mirrored by a rich diversity of organizations essentially unbundling employability services and adding value back into employers and universities by facilitating the integration of study and work. In recruiting and matching services for students and employers, there are start-ups like Gild, Pymetrics, and Kalibrr. The entrepreneurial venture Koru provides a bridge to employment by upgrading the business skills of liberal arts graduates. Collegefeed, Evisors, and Doostang provide job-matching opportunities for graduates. And Degreed and Accredible are developing new ways of validating what people know and can do for both employers and universities.

Each of these unbundled employability solutions is delivered in various blended forms—hi-touch/hi-tech, college outsourced service, employer insourced service, intermediary organizations. This is a diverse set of solutions, yet they are all encompassed

by the employability concept that catalyzes academic learning with experiential learning, mentoring, recruiting, job matching, and credentialing in a broad human capital development ecosystem which acknowledges that knowledge development and deployment in a learning economy are not linear but dynamic and recursive. Stokes notes the sentiment of one University of Pennsylvania interviewee who could "envision a future where students may spend close to a year on campus to experience the benefits of building a network and then enter the workforce and enroll on a subscription basis to have access to a library of just-in-time education resources in the form of an online 'mini-course,' meaning that the model shifts from one of 'learn-learn-learn-certify-wait-wait-wait-deploy' to one of 'learn-certify-deploy, learn-certify-deploy.'"

Stokes's consistent and compelling theme, captured by the employability concept, is that twenty-first-century human capital development isn't an either/or proposition; rather, it is both an academic and an applied learning process requiring many, and new, higher education institution and employer partnerships. The myth of academic versus vocational learning embedded in higher education delivery systems begins to unravel, leading to the natural question—What's next?

FROM ECOSYSTEM TO VALUE CHAIN/MARKETPLACE

The second contribution Stokes brings to the literature is his detailed, and almost real-time, illustration of the unbundling of services that surround the transition from higher education to employment. The set of employability activities and actors he describes, from Degreed to General Assembly to Koru to Northeastern University, covers such a breadth of emergent

and innovative practices in human capital development that one cannot discern a mature business model, value chain, or marketplace. Stokes posits an emergent value chain that calls for thoughtful study with regard to sustainability.

Stokes's detailed ecosystem description offers clues about how the marketplace may mature and sustain viable partnerships.[7] To explore the potential market impact of these clues, we can use concepts from the innovation literature. Among these key concepts are understanding the distinction between sustaining innovation and disruptive innovation, using enabling technologies, employing business model analysis, and forming value chains and standards. Sustaining innovation is when technology is applied in a way that makes it easier to deploy people and processes to better serve existing customers. In contrast, disruptive innovation is when technology is applied in a way that creates a simpler, more affordable product for a new group of customers who, in most cases, were not buying (or succeeding in) the traditional offering.

Stokes's ecosystem contains both types of innovations. Boot camp experiences from Koru to General Assembly currently serve the best customers of higher education—students who attend relatively selective institutions—so in many ways they can be seen as sustaining and adding to the existing offering. Similarly, Northeastern's co-op model going global is most arguably a sustaining innovation. Yet organizations such as Degreed and LinkedIn are positing entirely different ways of recognizing competence and credentialing it, a service historically reserved for colleges and universities. If they succeed, employability recognitions will be introduced to many more actors in the market. Even research universities are moving toward disruption. For example, Georgia Tech's partnership with AT&T on the use of massive open online courses (MOOCs) to

create an innovative online master's degree program in computer science for $8,000 could end up being a truly disruptive innovation.

Many of the employability ecosystem actors and organizations depend on Web-enabled platforms that make learning tools and labor/education market intelligence more readily available and communicable. Technology enablers as a requisite for innovation are thus highly visible in the market. Given that employability is about the integration of academic and applied learning opportunities, the driver of market growth and value-added partnership will be those technologies that enable deep integration. Northeastern University's virtual co-op approach (the ALIGN program) is one to watch in this regard. It has the potential to demonstrate the ability to scale the use of technology in experiential learning in heretofore unheard of ways.

A simple enough business model typology encompasses three basic types: a solution shop, which tackles hard-to-define (and -solve) market challenges; a value-added process shop (VAP), which organizes inputs through defined processes to create offerings of higher value; and facilitated user networks, which enable participants to exchange value with each other. A defining characteristic for each business model is how payment is made. Solution shops that receive a fee for services rendered are less tied to outcomes because they are tougher to predict. VAPs develop methodical ways of organizing resources to achieve certain outcomes with regularity and are paid for achieving the outcome. And facilitated user networks are paid for by a subscription to or membership in the platform.

Stokes's employability ecosystem encompasses all these models. A relevant question is whether any given entrant has identified the correct business model. For instance, Hack Reactor,

a twelve-week program that bills itself as an equivalent to a traditional computer science degree with job placement and charges $18,000, is positioning itself as a VAP with guaranteed outcomes. It may be too early to know if it can deliver the equivalent of a computer science degree given its time and cost parameters. This sets up the potential for failure within the market. With regard to the research universities, a key will be what type of business model is a given innovation. The NY You Knowledge Commons is an interesting example. It is a technology-enabled, closed mentoring network limited to NYU alumni and community members. It is a facilitated user network business model. Hence, it should be funded by a membership fee. How does this model fit with the pricing for the core education offering that could be considered a VAP? When does someone begin to move into the NY You?

The final two components, value chain formation and standards, are highly interrelated.

With business models still forming, it is difficult to see how to extend employability value chains that might link different, distinct services (e.g., mentor connections, experiential learning, labor market matching) in a sustainable, coherent way. Right now the ecosystem is experimenting with organization and partner boundaries and value propositions.

One key to how these early experiments may play out is the evolution of standards that will guide quality and interoperability of business across the employability ecosystem. For example, in the competency-based learning space, the Degree Qualifications Profile (DQP) initiative, supported by the Lumina Foundation for Education, is a framework for illustrating what students should be expected to know and be able to do once they earn their postsecondary degrees. The initiative proposes specific learning outcomes and competencies

that benchmark the certificates and associate, bachelor's, and master's degrees along five dimensions: applied learning, intellectual skills, specialized knowledge, broad knowledge, and civic learning. Employability ecosystem players could leverage the DQP standard to seamlessly rebundle a set of services from competency-based classroom learning to workplace-based learning projects to employer match. The DQP would provide the lingua franca that allows disparate players to deliver quality and responsive services, thus forming a sustainable value network. There are similar standards that could be brought to bear in career coaching, peer-to-peer networks, etc. Robust standards will likely form the foundation of the best value chains, so actors in the employability space should seek out these activities for partnership first. For example, could Koru, Degreed, and Georgia Tech, through its $8,000 master's degree, create a new value chain for preparing and credentialing skilled computer science professionals on demand based on the DQP backbone? Or could Northeastern combine its ALIGN program with Accredible and GILD to create a value chain for preparing career changers in faster and more affordable ways?

As Stokes's ecosystem methodically evolves toward maturity, we should continue to observe and invest in the innovations that bear up under these analytical tools. Further, as higher education institutions and employers develop the competence to manage both sustaining and disruptive innovations in the employability ecosystem, it will be exciting to watch the new human capital development system emerge. I suspect that both higher education institutions and employers will look quite different when it does. As Stokes writes, "We may well need to go beyond thinking about how education prepares students for work and begin thinking about how education reaches,

informs, and develops a different kind of character: the *student-employee,* who is both a learner and a current or future worker." This reimagining posits learning economy thinking that will shape the structures and futures of employers and higher education institutions alike.

In today's learning economy, the integration of study and work at research universities will be key to America winning the next leg of the race between education and technology. Indeed, Peter Stokes has provided a useful guide for understanding how the integration of study and work at research universities will form a human capital development system for the twenty-first century.

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