

Chapter 4

Charting a Future With Skills: The Need for a Skills–Based Education and Hiring Ecosystem

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ABSTRACT

Navigating life and charting a path towards educational goals and professional advancement is challenging in troubled water. When structures and trusted tools previously relied on begin to falter, chaos can beset those on the journey. Therefore, innovation and new ideas must be championed and tested to develop a greater sense of the possible and to provide unique and tailored solutions to everyone. The authors advise the adoption of the Diamond of Interoperability, a set of four principal statements—open skills, open achievements, open records, open pathways—to support the workforce development needed for the future of work. These ideas are rooted in transparency, collaboration, transformation, and interoperable technology to provide answers to the current challenges in education and hiring in the turbulent waters of the 21st century economy.

In the beginning of navigation, early humans did not venture too deep into the open water or stray far from land. They kept the shore in sight and traveled primarily along coastlines, using landmarks to gauge their progress and position. Traditional hiring and education clings to these same ways of early navigation. These methods and well-worn pathways have proven they are successful, but what happens when the storm of change approaches, the trusted landmarks fade, and the well plotted routes lose their relevance in the face of greater needs and more targeted desires? How is the journey of a life charted? Through constellations made of skills, these are the stars that will guide new explorers.

As we emerge from the latest health and economic crises, the flaws in our talent supply chain have become increasingly more apparent. While employers are looking for the most efficient path to hiring a skilled and diverse workforce, they are also struggling to define and identify the right talent, even though

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in many cases, it is right in front of them, yet somehow unseen. Learners struggle to communicate the skills they have demonstrated as part of their learning journey leading to a communication gap that makes it difficult for employers to find skilled talent (Carroll, 2017). Meanwhile, individuals who have gained in-demand skills through education and on the job experience, do not understand the marketability of those skills and are unable to communicate their value in any meaningful way beyond that of transcripts and credential attainment. Individuals also do not have a way to reflect and share the skills that they are learning on their path to credential attainment, resulting in potentially missed opportunities where they could have leveraged their skills earlier in their career path. To further exacerbate the issue, education and training providers are frequently siloed in their approach to designing and delivering their offerings and are either not aligned to workforce need or their course outcomes do not make resulting skill attainment clear to consumers. As more non-degree credential offerings flood the job market, employers are growing increasingly perplexed as to the value of both the credential and the individual credential holders (Whissemore, 2022). As a result, there is a disconnected and floundering ecosystem of talent that is leaving many stranded, especially those in underserved and overlooked populations. All of this while the skills gaps and communication gaps between employers and individuals continue to widen (Wiley, 2019). There needs to be a better solution that will benefit all.

So why skills and why now? There are several shifts in the talent supply chain that have been underway but are now accelerating as the pandemic timeline continues to evolve. Employers are struggling to find and hire the right skilled individuals. A recent report from the Harvard Business School reveals that companies are increasingly desperate for workers. As they continue to struggle to find people with the skills they need, their competitiveness and growth prospects are put in jeopardy (Fuller, 2021). As the economy continues to recover, it will intensify the struggle to find talent. According to the U.S. Bureau of Labor Statistics' December 2021 jobs report, the number of job openings (10.9 million) is outpacing the number of unemployed individuals (6.3 million). Current events have only hastened what has been occurring for years—a continued widening in the skills gap.

There are several factors driving this divergence. First is the acceleration of new and complex skills. According to a 2018 report from the World Economic Forum, they estimate that approximately 42% of the skills in demand for jobs across all industries will change between 2018 and 2022. The 2020 Jobs Report from the World Economic Forum finds the trends continuing only faster and further on that path. According to a Gartner analysis of more than 7.5 million U.S. job postings in 2018, those in IT, finance, and sales roles required an average of 17 skills (Wilde, 2021). The same types of roles now require an average of 21 skills, including at least eight that were not previously required. At the same time, 29% of the skills from an average job posting in 2018 may not be needed next year (Wilde, 2021). How can a person keep up?

In addition to escalating complexity and ever-changing skills, employers increasingly rely on degrees as a proxy for professional and enduring skills. Sometimes called “soft” skills or “21st Century” skills, these are the essential interpersonal human skills. As can be seen in a recent Emsi report, they are some of the top in-demand skills (Oldham, 2022). Yet, in this knowledge-based economy, college degrees continue to have weight and significance. The Education Trust estimates that 65% of jobs required a minimum of a bachelor's degree in 2020, up from 28% in 1973 (Nichols, 2017). The college path is also increasingly rewarded as those who hold a bachelor's degree or higher earn almost \$1 million more over their lifetime than those high school graduates who do not pursue the college route (Abdelal, 2021).

However, this reliance on what has always been the expected path—degrees—is a profound and deeply rooted mindset and experience that is making the U.S. labor market more inefficient. Job postings that

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traditionally were viewed as middle skills jobs, those that require employees to have more than a high school diploma but less than a college degree, now stipulate a college degree as a minimum education requirement—while only a third of the adult population possesses this credential (Fuller, 2017). The inherent problem in this dependence on old modalities was laid clear by Scott Pulsipher, President and CEO of Western Governors University (WGU) in testimony to the U.S. House Committee on Education and Labor, “Valuing degrees only—a signal of skills—rather than skills themselves makes little sense and can exacerbate the structural inequalities that influence who access college, and particularly who accesses selective institutions” (Pulsipher, 2020).

To further compound the issue, these degree requirements continue to be a barrier for many minority populations. Bryon Auguste, an economist who served as deputy director of the National Economic Council in the Obama administration and now is the CEO of Opportunity@Work explains,

If you arbitrarily say that a job needs to have a bachelor’s degree, you are screening out over 70% of African Americans. You’re screening out about 80% of Latino-Latina workers, and you’re screening out over 80% of rural Americans of all races. (Carapezza, 2021)

It is evident that the way people are navigating in this new world is different than before. They are acquiring skills in new and unique ways apart from traditional paths and experiences, but individuals remain challenged by expectations set in the realities of the past. Organizations are attempting to shift the paradigm about aptitude from one that is based on a four-year degree or credentials to one that is based on skills, to give more people a meaningful pathway into an opportunity to have earned success (Abdelal, 2021).

This tension is beginning to drive organizations to rethink their degree requirements. Several large corporations, including Microsoft, Netflix, Google, and Tesla, have already announced a shift toward skills-based hiring (Ahktar, 2019). In addition, Google announced three new certificates that will be treated as equivalent to a four-year degree for relevant roles (Bariso, 2021). For smaller companies, those with less than 500 employees, for which most Americans work, could there be a collective solution on the horizon for how to activate skills within their hiring practices? Further within this equation, coalitions such as OneTen are working with employers and education providers to advance upward of one million Black Americans in 10 years’ time into in-demand family sustaining careers (OneTen, 2022). Many large corporations have signed up to support this mission, with a “skills-first approach,” beginning with unpacking the actual required skills as opposed to degrees and other barrier credentials.

But are the various constellations of skills guiding anyone? As new avenues are explored, many individuals must feel just like those sailors who began to push further out from shore and into open waters. As this exploration begins it is paramount to define which points are guides and how each is found in the night sky.

BACKGROUND

Skills-based hiring is a set of practices which focus on identifying the skills needed to be successful in a given role and then matching potential employees to the opportunity. This matching is based on their skills and competencies or the aptitude they have shown for acquiring the necessary skills quickly. This connectivity creates the right environment for business growth and success as it means having the right

workforce with the right skills, in the right place, all at the right time (Curnow, 2021). The tide is shifting as employers take strides to adopt skills-based hiring (Arnold, 2018). More and more individuals and hiring managers experience how limited the process can be when the hiring pool is restricted by rules derived from past biases and beliefs (Skillful, 2019). This is clear in recent developments seen by LinkedIn that show a 21% increase in job postings advertising skills instead of degrees (Roslansky, 2021). But there is still only a small percentage that are striving to begin to retool their processes. The overall search for skilled talent is described as difficult by many organizations (Maurer, 2021).

And while there is this inability for employers to find the right talent, at the same time an enormous and growing group of people are unemployed or underemployed, eager to get a job or increase their working hours. However, they remain effectively “hidden” from most businesses that would benefit from hiring them by the very processes those companies use to find talent (Fuller, 2021). A report from Harvard Business School writes that there are more than 27 million “hidden” individuals in the U.S. described as people who are “unemployed or underemployed, eager to get a job on increase their working hours”; however, although many of them possess the right skills, they are lacking the credentials, which effectively eliminates them from many of the automated Applicant Tracking Systems that employers use today (Fuller, 2021). According to a recent article in the New York Times, as many as 30 million Americans have the skills to earn 70% more income but lack either awareness of this latent potential or ability to validate it (Lohr, 2020).

Occupations are quickly changing and being affected by technological advancement. This has made it exceptionally hard for workers to acquire skills that are relevant. The evolution in job content has outstripped the capacity of traditional skills providers, such as education systems and other workforce intermediaries, to adapt (Fuller, 2021). The ugly end effect is that to obtain the skills that are in demand by employers, the person seeking employment must already be employed within the ecosystem. To be on the outside of employment is to truly be left in the cold. Learning and employment systems need to change to adapt to rapidly evolving needs for short and long-term workforce development needs.

The learning and employment ecosystems were designed for a world of work that is no longer here. Current employment foundations are built on the assumption of linear careers largely using a traditional life model of ‘learn, do, retire.’ In order to be seen by the systems as employable and current, workers must run on a treadmill of reinventing their skillsets and offerings; companies must endlessly hunt for new and innovative talent sourcing, matching and development strategies; and educators face pressure to explain their return on investment, and increasingly, their relevancy. Consequently, there is a pressing need for more efficient proxies that can relay the skills that individuals acquire throughout their life course (World Economic Forum, 2019).

While it is true that following the shore will bring the sailor to port reliably in the case of a degree and with historical positive return in higher income—more routes are being opened for access to those who might not be able to chart the traditional course. This allows more talent to enter the economy and thereby push innovation, such as micro-credentials, and new and previously unthought of destinations to the forefront. There are nearly one million credentials offered in the United States through education, training, licensing, certification, and other organizations. It is a vast and growing landscape to be explored, tamed, and leveraged (World Economic Forum, 2020).

The pandemic has merely illuminated the importance of faster, more targeted avenues for developing and refreshing skills. Learner-workers need more efficient ways to skill and reskill to meet the shifting demands of an ever-changing labor market. Credentials can provide a shorter-term solution to validating skills for immediate value. In fact, a survey conducted by Strada Education Network found that 60%

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of Americans now prefer shorter-term credential options to full degree programs, especially in these unpredictable times (Ashburn, 2018). However, these credentials will not gain broad employer adoption unless the underlying skills become more transparent to both individuals and employers. Shawn O’Riley, associate vice president of professional education and special programs at Pace University recently stated:

A quarter of American adults hold nondegree credentials, meaning something short of an associate or bachelor’s degree, according to federal data, and they’ve become more popular in recent years. Among other things, advocates say, they encourage equity by giving consumers a way to get jobs without spending three or more years in college getting degrees they don’t need. If there’s a way to get a really skilled employee in less time and with less effort, they’re really interested in that, but they struggle with that same question, which is, ‘What’s the real currency of an individual credential?’ (Marcus, 2021)

Traditional education does not support students in their understanding of the skills they are gaining through their academic programs. Students, and employers, need more transparency. This skills view will also illuminate for students the skills that they are achieving which may not be as apparent. For example, students will know that through their general education math course, they not only learned critical domain skills, but also enduring, lifelong skills like problem solving, critical thinking, and communicating data. This transparency will allow students to make career-relevancy connections and to communicate these skill achievements to employers (DeMark, 2021).

A skills-based education and hiring infrastructure has the potential to significantly improve the talent supply chain. By focusing on the needed skills, education providers can focus their offerings on the skills that are most in demand, employers can more swiftly upskill workers to fill changing organizational workforce needs and evaluate whether the skills an employee has gained in a shrinking industry can be quickly converted to valuable skills in a field experiencing growth and talent shortages. Skills transparency across systems will enable individuals to make better decisions regarding education pathways and be better able to understand and communicate the value of the skills they are obtaining throughout the course of their education and work experience.

Fortunately, we are starting to see some movement in this space towards creating a new interoperable skills-based currency that can help to connect the value between employers, individuals, and education providers.

THE SKILLS DILEMMA

Higher education is facing multiple challenges to our existing portfolios of offerings—namely, degree offerings. Clear signals are being sent by employers that the “degree” is a poor proxy for learner-worker development and job readiness. For colleges and universities offering professional degree programs (e.g., business, healthcare, teaching, information technology, etc.), this feedback is deflating. When combined with decreasing enrollment numbers, increasing non-completers, and increasing scrutiny on degree value given rapidly escalating student debt, institutions are presented with an opportunity to reinforce the value of credentials by placing the learnings into the context of the labor market.

While degree programs are careful to meet accreditation requirements, both regional and programmatic, they often leave learners and employers unclear as to how they relate to job requirements and workforce demand. As a result, learners choose programs and majors, and even institutions, for many

reasons—personal or professional—and with only a general understanding of how their learning will contribute to their goals and ambitions. But many learners are presently disadvantaged in their understanding of how their investment of time and money will provide benefit to the wellbeing of themselves and their families. Further, learners often struggle to translate how their learning prepares and qualifies them for jobs because they do not realize the skills they are gaining and, therefore, cannot articulate them in any meaningful way. For higher education and employers to help one another more effectively, a shared language and clarity around skills is necessary. This need is articulated well in the 2018 Strada Institute for the Future of Work and Emsi report, *Robot-Ready: Human+ Skills for the Future of Work*, which says, “[T]he time has come for a modern-day Rosetta Stone to translate and decode the intersection between postsecondary education and the workforce” (Ashburn, 2018).

For those learner-workers seeking to maximize the value of their efforts and hard-earned dollars, the lack of a clear line-of-sight of around training can be frustrating. Where obtaining a college degree can provide a reasonable return on the investment (ROI), the increasing cost of degrees and the average time to completion is challenging that traditional ROI. But what of the many learners that never complete a degree? The oft-quoted number of approximately thirty-six million people with some college and no degree is demoralizing when we consider the debt these learners incurred while they still lack a credential (National Governors Association, 2021). By relating educational pursuits and resulting credentials to the labor market, as well as transparently defining credentials, learners will be able to understand the real benefits of education.

NAVIGATING NEW TRANSPARENT PATHWAYS TO OPPORTUNITY

Imagine a young single mother, Latoya. She is struggling financially and eager to find a better paying job to support her two young children. She is a self-starter and has worked for years as an assistant manager at a local family-owned restaurant. As she worked, she earned her high school diploma and a Certified Nursing Assistant (CNA) credential with the aim of getting a better job within healthcare. Latoya decides to pursue a bachelor’s degree in Nursing at Western Governors University to achieve her long-held dream of becoming a nurse.

On application, Latoya uploads her profile into the WGU Achievement Wallet which immediately validates much of her prior work experience and industry-recognized credentials against nursing degree requirements. Because Latoya can capitalize on her existing skills and credentials, it puts her farther ahead than she expected in a nursing BA program. Latoya is also able to view other healthcare pathway opportunities within WGU and sees she has flexibility in her options to pursue a healthcare degree.

Latoya decides on the BA in nursing and begins to work towards her degree at WGU. As Latoya progresses in her program, she is excited to see the list of her in-demand skills grow as they surface to her Achievement Wallet with every credential she earns. She is energized and engaged as she works through her WGU program seeing the clear alignment and relevance between her coursework and the high-demand skills nursing employers are looking for.

During her second term, Latoya decides to put her existing skills to work and seeks employment as a Certified Nursing Assistant (CNA) within her hometown. Through her Achievement Wallet, Latoya can see current job opportunities in her own zip code that align with her competencies and credentials. Latoya can customize her wallet to showcase her profile to prospective employers hiring for CNAs. She is even able to opt-in to being discoverable by recruiters via her Learning and Employment Record based

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on her existing skills and credentials. A few months later, using insights from her Achievement Wallet, Latoya starts a job as a nursing assistant at a hospital just a few blocks from her daughter's school. Her employer *found her* based on her credentials, experience profile, and location—a perfect match. Latoya is now working in a job she loves while also being able to work towards her degree full time. A flexible education schedule is a must for her busy schedule!

Two years later, Latoya graduates from WGU with her bachelor's degree in nursing and is immediately offered a job as a full-time nurse at her existing employer. Post-graduation, Latoya still has access to her WGU Achievement Wallet and can keep her eye on additional employment and educational opportunities that are available to her. She is interested in exploring a master's degree in nursing with a focus on education when the time is right. Via the Achievement Wallet, Latoya can see pathways to pursue her advanced degree both within and outside of WGU as well as employment opportunities that are available to her as she continues to pursue her life and career dreams.

CREATING AN OPEN MAP

In a dynamic, ever-changing labor market, learners need access to educational programming options that match their career goals and allow for just-in-time skill development. They also need to be able to tell a compelling story about the skills they possess, thereby highlighting their unique talent brand. Employers need better insights into the skills of their current workforce as well as the skills within the external talent pipeline. They need more transparency into the skills an individual has based on their experience and credentials, and they need faster, more automated ways to match highly qualified candidates with high-value jobs.

Since its establishment in 1997, Western Governors University (WGU) has been built with learners at the center of its competency-based model to create more equitable pathways to opportunity in support of critical workforce development needs. WGU has focused on making education more accessible for every learner to maximize their success in degree attainment and to achieve their career aspirations (WGU, 2020). We recognize that to help our students actualize their dreams for career and degree success, we must continue to innovate to meet the needs of learners and employers alike by enabling better, faster, more flexible models for connecting talent with opportunity.

Building on its competency-based roots, WGU has become a great use case for transforming pathways to opportunity with skills as the underlying currency and infrastructure. With the mindset that how individuals' access, use, communicate, and apply their education experience will continue to evolve, WGU has created a skills-based achievement architecture to map all competencies and credentials to high-demand skills, including the enduring, essential skills like critical thinking, social emotional intelligence, creativity, and the ability to work with diverse collaborators. These high-value industry-relevant skills are then mapped into educational experiences and credentials to better support the upskilling and reskilling needs required for our dramatically altered job market. WGU then surfaces these skills and competency achievements to students through a learner-owned record, which can then be shared with current and potential employers, thereby facilitating a more efficient and effective match of talent to opportunity. Transparency across individuals, employers, and education providers is key.

A CASE FOR OPEN DATA STANDARDS

To bring Latoya’s story to life and create better systems for connecting talent with opportunity, an open data infrastructure that breaks down silos and bridges the gaps between workforce and higher education is necessary. This infrastructure must be predicated on the use of open standards to drive data and system interoperability. An interoperable infrastructure uses open standards and common ontologies and frameworks to enable data to be machine readable, exchangeable, and actionable across technology systems and, when appropriate, online (Department of Commerce, 2020). Why is data and system interoperability so important? Consider the early beginnings of the railroad system in America. Before the 1840s, planning and construction of railways in the United States were disconnected and made primarily for short independent passenger lines that ultimately failed to be financially profitable (Library of Congress, 2022). The Railroad Act of 1862 initiated the momentum and funding needed to work towards a connected, coast to coast system, and in 1869 the existing eastern US rail network was connected to the pacific coast. In addition to this, early railroad networks were constructed with different gauge tracks with no unifying standard. These siloed networks began creating problems for the efficient movement of supplies during the U.S. Civil War and their rectification caused great economic pain (Puffert, 2000). Without an interoperable system, organizations are at risk of the unintended consequence that they may be building disconnected railroads to nowhere for their learners and workers, creating the equivalent of the failed short passenger lines within their own organizations.

An interoperable infrastructure that is built upon open data standards can connect the world of work and the world of learning in unprecedented ways, create more transparent pathways to opportunity for learner-workers, establish a system in which data may move freely across systems, and enable employers to hire and train the talent they need when they need it. Specifically, WGU has identified four major open standard domain areas, when working together, create the foundational infrastructure needed to enable scalable, connected solutions for a more interoperable ecosystem of education and work:

- **Open Skills** to bridge the gap between work and learning by establishing a common skills syntax language and improving open documentation of in-demand skills from the labor market in a machine-readable format.
- **Open Achievements** to demystify credentials and achievements for learners and employers by using a consistent, machine-readable standard for packaging information about accomplishments and recognition of work and learning.
- **Open Records** to empower learner-workers with access to their learning and employment records from any institution and to share them with any education provider or employer using a standard, digital protocol.
- **Open Pathways** to create more transparent insights into education and career pathways using a standard logic for connecting learning achievements and/or work experience within and across education and employment providers.

Together, these four domains of open standards create a recipe for true interoperability between the world of work and the world of learning. WGU has termed this the “diamond of interoperability” and has used it as a foundational framework for our technological and process transformations over the last three years to support our students in achieving their goals and maximizing their career success.

Figure 1. Diamond of Interoperability



THE WGU USE CASE

As WGU began exploring more skills-based solutions for our students, we used the diamond of interoperability to make decisions about what standards we would adopt to power the solutions we are building. The next section will discuss the specific standards WGU has adopted to power skills-based solutions for our learners.

Open Skills

As explained by DeMark and Kozyrev (2021), currently skills interoperability is out of reach, both within and between organizations because available skills data are unstructured and not machine readable (DeMark, 2021). Adding to this challenge, existing data standards do not *directly* support interoperability of discrete skills data and posed an early obstacle for thinking about how we might approach an open standard for skills. To move to an open and actionable skills data ecosystem, where skills data is machine readable, structured, and interoperable, WGU in collaboration with the Open Skill Network developed the Rich Skill Descriptor (RSD) Schema as an extensible, skills-based universal description language for the interoperability of structured skills data (Rich Skill, 2022). In an open standards ecosystem, the RSD serves as a syntax for structuring skills data in a format that makes it publishable or usable by

numerous applications—industry-aligned academic credentials, skills-based curriculum design, and skills-based job descriptions, etc.

Open Achievements

To cover data needs around achievements, within and beyond the institution, WGU has selected Open Badges standard from IMS Global, a mature, industry-adopted standard, as the Open Achievement standard (Home, 2022). Open Badges allows for the central management of badges issued by an organization and for the ability for practical metadata such as earning criteria, associated skills, competencies, industry standards, or other framework aspects within the badge. The other major aspect of this data standard is that it covers assertions of achievements that are verifiable, portable, and sharable by the earner.

Open Pathways

As modeling complex learning pathways requires a flexible data model, WGU has adopted the Credential Transparency Description Language (CTDL), (Credential Engine, 2022) and the CTDL Profile of Achievement Standards Network-description language (ASN-DL) and (CTDL-ASN) specifications published by Credential Engine to enable the design of our educational pathways. CTDL is a vocabulary of terms about credentials and their relationships to other frameworks and includes the definitions of pathways and pathway components. CTDL-ASN is a vocabulary of terms about competencies and competency frameworks. When combined, CTDL and CTDL-ASN enable flexible pathway construction that can be comprised of components such as frameworks, assessments, courses, credentials, extracurricular or co-curricular activities, jobs, etc. These functionalities are necessary for WGU’s pathway functionality to provide transparency to students into flexible learning pathway options and more transparent career pathways.

Open Records

WGU uses the Comprehensive Learner Record data specification and model from IMS Global to support more robust data sharing within Learning and Employment Record solutions. The CLR data model covers much of the traditional record “academic data” that Student Information Systems do via the Postsecondary Electronic Standards Council (PESC) Academic College Transcript industry standard (PESC, 2022). Additionally, WGU has adopted the IMS Global Competencies and Academic Standards Exchange (CASE) standard to facilitate the format and exchange of information regarding learning and educational competencies, including information that pertains to rubrics, and supports association across frameworks (Competencies, 2022).

By adopting this set of open standards and specifications, WGU can exchange data from multiple sources and subsequently surface powerful information relevant to our learners in meeting their next goal, whether that goal is academic or career-oriented in nature. For the last three years, WGU has focused on operationalizing the diamond of interoperability as a means for providing our students with better insights into the skills they have, the skills they need, and the pathways available to them. We have focused on four major value streams to bring value to our students:

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- **A skills architecture** where high-demand, workforce skills are foundational to academic programming development and decision making
- **A skills-denominated achievement** system where all WGU-issued credentials include clear alignment to workforce relevant skills
- **A learning and employment record** where WGU can instantiate verified learner credentials
- **A learner-owned Achievement Wallet** where learners can cultivate, curate, and share their achievements and gain insights into learning and career pathways they may choose to explore.

Skills Architecture

WGU has always been competency-based and hyper-aligned with workforce needs. As Provost and Chief Academic Officer Marni Baker-Stein explained in an article in the Diplomatic Courier, “we have doubled down on that commitment by mapping the skills and competencies employers want into our courses and programs.” (Baker Stein, 2020). Over the last two years, WGU has adopted a skills architecture function and practice, where employer-valued, open skills are used to inform programming development and decision making. Using WGU’s Open Skills Library which currently includes over 13,000 rich skills descriptors, all competencies and programs have been tagged with relevant skills data. This has enabled our ability to create a dynamic skills relevancy metric for every program, illuminating real-time opportunities to improve the workforce relevance of our existing portfolio to ensure our credentials continue to provide students with the skills they need to be successful with current employer expectations and with the future of work. Additionally, by using rich skills descriptors from the WGU library to inform the design and development of every new program, we can ensure close alignment between the skills students need and the educational pathways we develop. Making these connections transparent in our program marketing information helps to support individuals in their decisions regarding which education programs and pathways are right for them and ensuring a strong return on their education investment.

Skills-Denominated Achievements

Through a systematic approach to skills architecture and using the open badges standard, WGU has the capability to include high-demand skills in its academic credentials. Using the open badge standard, high-demand skills are included as metadata within WGU digital credentials, making the skills represented by the credential more transparent. This work ensures our learners have a better line of sight into the skills they have demonstrated in earning their credentials. It also provides employers and other education institutions with better transparency into the value of WGU credentials and the skills our learners have demonstrated. As noted by the World Economic Forum (2019), skills are becoming the new currency of the labor market where “...potential returns are vast, for individuals, for businesses and for economies.”

Learning and Employment Record

To increase the portability and usability of learner credentials, WGU has begun implementing Learning and Employment Record (LER) technology. As defined by the American Workforce Policy Advisory Board Digital Infrastructure Working Group an LER is a system that contains verifiable information about a person’s achievements spanning an inclusive range of contexts, whether educational or training processes, formal or informal, classroom-based or workplace-based. LERs (learning and employment

records) can seamlessly record, verify, transmit, and interpret information about learning achievements between learning institutions, businesses, and individuals (Department of Commerce, 2020). As our efforts in this area expand, WGU will instantiate learners' credentials to their Learning and Employment Record which will enable advanced capabilities for every learner to curate and share their achievements with prospective employers. The LER also provides more efficient mechanisms for employers to search for talent within the LER ecosystem as learners opt-in to making their credentials and related skills discoverable.

Achievement Wallet

Building on the culminating capabilities of a systematic skills architecture, skills-denominated achievements, and LER technology WGU has deployed its initial prototype for an Achievement Wallet. The Achievement Wallet is an interoperable, learner-facing application technology that provides learners with the ability to curate, customize, and share achievements from their LER with prospective employers or other education institutions. The Achievement Wallet provides students with the ability to showcase their unique talent brand, based on the credentials they hold and the skills they have demonstrated. Because of the power of the skills architecture and skills-denominated achievements within WGU credentials, the Achievement Wallet also has compassing capabilities to reveal both career and educational pathway insights to a learner based on their current skillset, career goals, and educational aspirations. Additionally, skills and competencies can be added to the Achievement Wallet as they are verified within a degree program, even before the final credential conferral. This enables students to take more immediate advantage of the skills they have already acquired and to be able to pursue career options earlier in their educational journey, as opposed to waiting for that final credential as evidence.

These four value streams when working together create a relevant, workforce-aligned experience for students with more streamlined mechanisms for connecting talent with opportunity.

CENTERING OPEN SKILLS: A CALL TO ACTION

The utilization of open data standards has been presented as a compelling case for how credential transparency can be achieved, put into context, and related to both career and academic pursuits for learners. It should be noted that WGU has been engaged for three years in applying the "diamond" as the framework for creating achievement transparency, alignment to labor market demand for skills, surfacing pathways and relationships between credentials and jobs, and allowing learners to take control of their record. Recognizing that such an endeavor may be daunting or untenable for many institutions in the short term, a discussion on how or where any institution may begin their own journey is warranted.

Credential providers (educational institutions, certification providers, etc.) can take the necessary steps to ensure their offerings are aligned with the labor market. Though this may sound difficult to implement, many credential providers are already including usable data in their existing systems, such as Student Information Systems (SIS), Learning Management Systems (LMS), and badging platforms that can be leveraged to provide more transparency and definition to credentials and further be leveraged to create labor market alignment. As programs are created within SIS systems, they are almost always aligned and labeled with a Classification of Instructional Programs code (CIP-C). By utilizing the National Center for Education Statistics (NCES) CIP Standard Occupational System (SOC) crosswalk

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institutions can begin aligning their credentials to occupations at the highest level (NCES, 2020). By so doing, an education provider can begin creating transparency for their learners by simply listing how the credential relates to jobs as a part of their standard catalog and in their program marketing information for both individuals and employers to see.

As an institution contemplates expressing the credential as a digital achievement, the open data standards allow for the inclusion of SOC alignment as part of the credential description, tagging and meta-data. Even a digital diploma provided as a PDF image file can include hyperlinks directing the viewer to information that is relevant to the credential. An example of this type of linking can be achieved where the credential definitions (and SOC or other alignments) may be located within the Credential Engine repository (Credential Engine, 2022) or IMS Global Competencies & Academic Standards Exchange (CASE) Network (IMS, 2022).

The Credential Finder website—provided by Credential Engine—currently catalogs credentials, organizations, competency frameworks, and more that are already available. Similarly, the IMS Global CASE Network may also be used to define and create alignments of credentials. For those institutions already defining credentials within the Credential Engine repository, the Credential Transparency Description Language (CTDL) data standard allows for alignments to be included – whether to competency frameworks or SOC codes. The CASE Network also includes these capabilities. By taking advantage of the Credential Engine repository or CASE Network, education providers can link their credentials earned by learners to the specific repository listing such as mentioned above regarding digital diplomas or website listings of credential and program offerings, which begins to support transparency of the underlying skills and competencies for these credentials.

Presently, approximately 2,500 colleges and universities participate with the National Student Clearinghouse by providing Degree Verification (DV) files wherein individuals earning credentials are listed. The information within a DV file may be somewhat limited but does allow for a credential major and minor (degree level) to include the relevant CIP code as an additional attribute. If institutions begin adding the CIP code to their DV files uploaded to the National Student Clearinghouse, they will be well positioned to take advantage of future functionality where their credentials can be cross-walked to the appropriate SOC code(s) and surfaced into a Learning and Employment Record (LER) or a learner-owned Achievement Wallet.

As educational providers contemplate how they may wish to eventually express academic achievements and credentials that align with workforce needs, or relate to other credentials, the utilization of both the Open Badges and Comprehensive Learner Record (CLR) data standards should be considered. By aligning to the related jobs, skills, competencies, and learning outcomes learners will have more visibility into the skills and value that underlie their learning and achievements. Put another way, by including skills as part of the data provided with a credential, learners are equipped with the same vocabulary used by employers. Utilizing open badges and CLR data standards becomes a powerful combination, providing robust and rich descriptive information and data that creates transparency, alignment, and meaningfulness for learners, employers, and other education providers.

As the dynamic nature of the U.S. economy increases the demand for highly skilled workers, higher education and other talent providers are challenged to respond with traditional and new short and long-form credentials that directly relate to occupational requirements. As Joseph E. Aoun notes in *Robot-proof*:

It no longer is sufficient for universities to focus solely on isolated years of study for undergraduate and graduate students. Higher education must broaden its view of whom to serve and when. It must serve everyone, no matter their stage in life (Aoun, 2018).

Digital credentials are emerging and will become the norm. Efforts are already underway to create a national Learning and Employment Record ecosystem with Achievement Wallets to better equip learner-workers, employers, and educators to understand and streamline the talent pipeline. As credential providers move from a paper-based system into digital, the opportunity to imbue credentials with meaningful data can accomplish so many desired outcomes. As discussed, digital credentials can be successfully aligned with occupational roles by leveraging existing processes and practices, and then integrated into the ecosystem of repositories and data standards.

FUTURE RESEARCH DIRECTIONS

Through this work in creating a connected skills ecosystem, we have discovered that most of the data needed to support skills-based education and hiring already exists; however, the data are siloed, not easily accessible, nor machine-readable. This makes the advancement of a skills-based ecosystem expensive, manual, and out of reach for most institutions. Further, as we see more organizations realizing the value of skills in creating a more equitable and efficient talent pipeline, these organizations are solving for this future in a siloed way, creating their own skills logic and systems that do not interconnect with the larger ecosystem efforts. While these organization-specific solutions for adopting skills as the currency of value begin to open pathways to opportunity, it is by tearing down the silos and connecting all these solutions through a common skills-based infrastructure where we will really begin to see the power of this work.

In pursuit of building this connective collaborative community, WGU has initiated with partners such as Walmart, Concentric Sky, and the U.S Chamber of Commerce Foundation, among others, the Open Skills Network (OSN), an alliance of innovators from education, industry, workforce development institutions, technology, and government agencies determined to solve this problem (Open Skills Network, 2022). The OSN mission is to change education and employment practices to be equitable and resilient. The OSN champions *skills* as the currency for good jobs and career advancement. To realize this future, the OSN seeks to enable and accelerate skills interoperability between technology platforms through open standards, and to reduce the costs and barriers of implementing skills-based hiring and skills-based education through shared technologies skills-based solutions. Formed in September 2020, the OSN is focused on establishing and supporting a community of practice focused on widespread adoption of skills-based education and hiring practices through the creation of: 1) a standard skills syntax that is open, accessible, and machine-actionable; 2) open-source toolsets to support the creation and adoption of this standard syntax across education providers and employers; and 3) a national network of interoperable open skills libraries and skills data to be leveraged across institutions.

After one year since its founding, the OSN has grown to over 1700 active members representing over 700 institutions from across the globe. These members are dedicated to advancing this much-needed paradigm shift towards skills-based education and hiring that ensures all learners, workers, and employers have the skills and talent necessary to thrive in a fast-moving and ever-evolving workforce. OSN members are committed to the adoption of skills-based education and hiring as a standard practice and are championing the evolution of open standards for meaningful and actionable skills data as the

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infrastructure of this new skills ecosystem. A national open skills infrastructure is critical to support the future of work and the development of agile and robust talent pipelines where all individuals have the opportunity to achieve their career goals.

To achieve these goals, the OSN has supported numerous pilots and collaborative projects in its first year. These projects have focused on the creation of open skills libraries, the testing of open skills tools, and the creation of use cases for how these skills can be leveraged and connected throughout the skills-based ecosystem. This early work is centered on supporting institutions with the adoption of an open skills-based infrastructure through the creation of playbooks, use cases, best practices, and toolsets.

Driving the OSN work on rich skills descriptions has been a big part of WGU's contribution as a member. The partnerships formulated within the OSN have allowed for the expansion and promotion of adoption such tools as the Open Skills Management Tool, which provides a technology solution for the authoring, publishing, and sharing of libraries and collections of RSDs (Rich Skill Descriptors)—the cornerstone of the work. This is a free open-source tool available to everyone. It is fundamental to the mission of OSN and all its members to support an open philosophy for advancement.

Throughout 2022, WGU will be rolling out various skills library collections containing over 13,000 RSDs that have been created across a wide variety of domains. With these skills collection releases, WGU will be partnering with employers, education providers, and others to further enhance and refine these dynamic skills libraries for all to use. In addition to job-specific collections, like cyber, HR management, and medical assistant, WGU has also created library collections focused on the future of work, including collections for socio-emotional learning, and diversity, equity, and inclusion skills. To further the goals of creating a national infrastructure, these collections will be published openly for anyone to access and use as part of their own skills work. Additionally, other organizations will begin to create and release their own skills libraries and collections for institutions to view and leverage. All this work contributes to the creation of a national skills infrastructure.

Using skills-based education and hiring practices, combined with an LER Achievement Wallet, provides employers and workers with a mechanism to find each other, while maintaining the privacy of learner-workers. Though a “blind” search for talent that meets hiring needs may help to mitigate inherent hiring biases, more research is needed to investigate unintended consequences of this technological solution. It is here a call for further research hopes to be heard and expanded upon by the greater community.

CONCLUSION

Change within the talent management pipeline is happening now, and how it is managed and communicated matters. The greatest benefits to individuals, employers, and education providers are fueled through skills-based interoperability—which will be created through collective action. As the future of work continues to advance at an ever-increasing pace, educational institutions, employers, and workforce development organizations must work together to evolve their education offerings, professional development, and hiring practices to find and activate new and hidden talent. The return on investment for those individuals weaving in and out of education and the workforce is not a zero-sum game or an either-or scenario between non-degree credentials and traditional degrees but will be built on personalization and a unique educational experience. Skills will be the new currency of value to be the connector of the infrastructure to enable this transformation.

Through these efforts in creating a scalable, interoperable skills architecture across multiple institutions in the talent supply chain, we lay the foundation to help transform the pathways to opportunity. WGU believes that these advancements in skills-based curriculum and learning experiences where the competencies that students are earning are linked to workforce-relevant skills and are transparent to both students, faculty, and employers will help underserved populations and under-identified individuals. As the future of work continues to advance at an ever-increasing pace, educational institutions, employers, and workforce development organizations must evolve their education offerings, professional development, and hiring practices to find new and hidden talent.

Much like early humans taking to deeper water we must learn to navigate into the future by mapping a new course set by modern stars—constellations of skills.

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KEY TERMS AND DEFINITIONS

Competency-Based Learning: Refers to systems of instruction, assessment, grading, and academic reporting that are based on students demonstrating that they have learned the knowledge and skills they are expected to learn as they progress through their education.

Interoperability: The ability of computer systems or software to exchange and make use of information.

Learning and Employment Record (LER): This is a comprehensive digital record of a worker's skills and competencies.

Skills-Based Hiring: A hiring approach that concentrates on a candidate's practical skills and performance rather than formal qualifications.

Transparency: The quality that makes something obvious or easy to understand.