NEW SKILLS NOW

Inclusion in the digital economy

IT'S TIME TO REIMAGINE WORKFORCE DEVELOPMENT

Anticipating and preparing for the impact of digital on the workforce is urgent, and just as critical to Accenture's business as it is to our corporate citizenship initiative, Skills to Succeed.

When we launched Skills to Succeed in 2010, the global economy was emerging from a recession characterized by high unemployment rates in many countries, particularly among youth. Since launching Skills to Succeed, Accenture has built relationships with an international network of more than 500 nonprofit organizations and other ecosystem partners who are closing skills and employment gaps for vulnerable and marginalized people around the world. Together we have equipped over 1.7 million people with the skills to get a job or build a business. We have also conducted and disseminated research that translates practitioner know-how into evidence-based insights about what works to improve the collective performance of the Skills to Succeed network.

When we look at the world today and five to 10 years into the future, we see a different picture from the backdrop against which Skills to Succeed was created. The rapid pace and scale of technological change and global flows of information, among other forces, are disrupting labor markets and fundamentally altering the future of work. While these shifts may create economic growth, new jobs and flexible work, they may also lead to the automation of routine, manual roles.

The ability to seize these opportunities and manage potential obstacles, however, is not evenly distributed.[1] Vulnerable and marginalized populations could face a 'double disadvantage' in the future, due to a lack of awareness of or means to adapt to these changes.

It is with these challenges in mind that we undertook our research, New Skills Now: Inclusion in the Digital Economy, to surface insights that we hope will be useful to our target audience:

- **Workforce development organizations—**practitioners designing and delivering programs to help vulnerable and marginalized populations thrive in the digital economy

- **Public and private sector funders** of workforce development organizations and programs

Our primary aims were:

1 To synthesize our learnings from Skills to Succeed and the latest thinking from the field into a **useful reference framework for workforce development practitioners and funders**

2 To spark and inform the debate among these parties on **how to future-proof workforce development** for a rapidly changing economy

We explored the following key research questions:

• How are the forces shaping the digital economy **redefining the future of work for vulnerable and marginalized populations?**

• What are the **skills needed to be included** in the digital economy?

• How can these skills be **developed and designed into effective programs?**

To answer these questions, we interviewed more than 40 practitioners and thought leaders from a wide range of fields spanning neuroscience, workforce development, corporate learning and talent development, education, sociology and cognitive psychology; analyzed over 130 million job postings; reviewed 1,000 workforce development programs; established a Learning Circle made up of experts from around the world; and assessed more than 25 of the leading frameworks on the future of work and skills.

Our research revealed a wealth of insights that will inform how we evolve Skills to Succeed and that we hope will be a catalyst for change within the field more broadly. For example, we found that while it is never too late to learn New Skills Now, the earlier individuals develop these skills and build the right habits, mindsets and neural pathways, the greater the likelihood of success. At the same time, the linear career paths of the past are giving way to a more dynamic trajectory. Future generations can expect to navigate multiple jobs, including many that have not yet been invented. A growth mindset, characterized by resilience, adaptability and a love of learning, underpins all other skills needed for job seekers and entrepreneurs to successfully navigate the changing world of work.

By sharing this framework and our findings, we hope to spark debate and contribute to a more inclusive future where all members of society can participate in and benefit from the digital economy.

Thank you,

Lisa Neuberger-Fernandez,
Managing Director,
Accenture Corporate Citizenship

Rachel Barton,
Managing Director,
Accenture Corporate Citizenship, UKI

NEW SKILLS NOW: INCLUSION IN THE DIGITAL ECONOMY

IT'S TIME TO REIMAGINE WORKFORCE DEVELOPMENT...

65% of children starting school today will hold jobs that don't exist yet[1]

NEARLY 1 IN 10 jobs is at risk of automation across OECD countries[2]

TO PREPARE MARGINALIZED AND VULNERABLE POPULATIONS FOR THE FUTURE OF WORK

DIGITAL & HUMAN
By 2024, roles requiring digital skills will grow by **12%**

COOPERATIVE & COLLABORATIVE
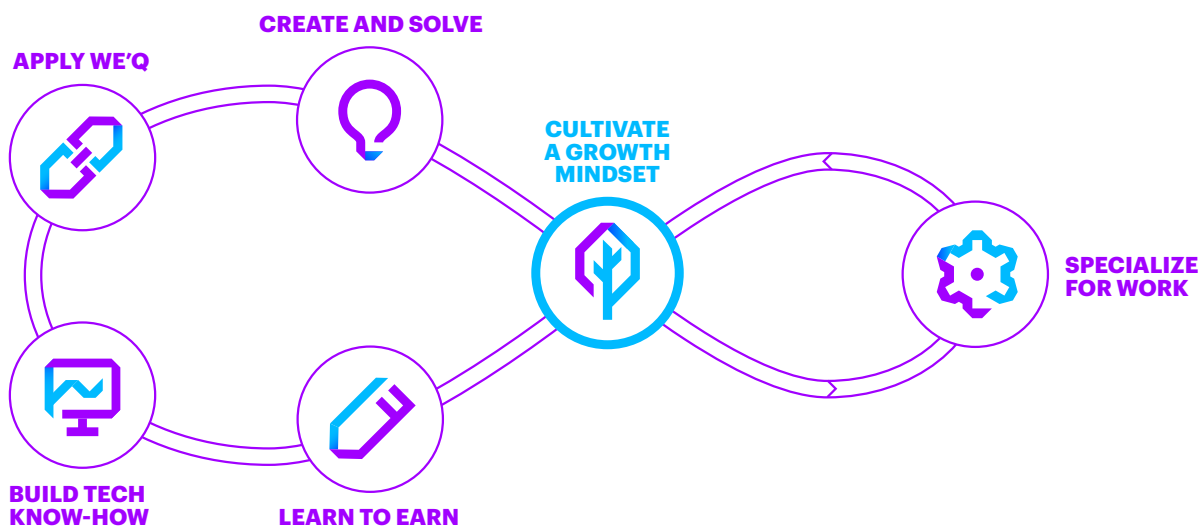**82% of businesses** using collaboration tools want to increase future use

KNOWLEDGE & TASK-BASED
Project-based work is set to increase from **28% in 2015 to 66% in 2020**

FLEXIBLE & FLUID
9.3 million US workers have multiple sources of income and fluid working arrangements

WE NEED NEW SKILLS NOW

APPLY WE'Q

CREATE AND SOLVE

CULTIVATE A GROWTH MINDSET

SPECIALIZE FOR WORK

BUILD TECH KNOW-HOW

LEARN TO EARN

APPLY WE'Q
Skills to interact, build relationships and show the self-awareness needed to work effectively with others in person and virtually.

BUILD TECH KNOW-HOW
Skills and know-how to use, manipulate and create technologies and data.

CREATE AND SOLVE
Skills to approach problem solving creatively, using empathy, logic and novel thinking.

LEARN TO EARN
Foundational skills to get work and be ready for the workforce.

CULTIVATE A GROWTH MINDSET
Skills to stay relevant, continuously learn and grow, and adapt to change.

SPECIALIZE FOR WORK
Relevant skills to address local market priorities and industry needs.

WORKFORCE DEVELOPMENT ORGANIZATIONS AND FUNDERS – HELP US BUILD THESE SKILLS. JOIN THE CONVERSATION: #NewSkillsNow

accenture.com/NewSkillsNow

[1] World Economic Forum, The Future of Jobs, Chapter 1 – The Future of Jobs and Skills, 2016.
[2] OECD, The Risk of Automation for Jobs in OECD Countries, 2016.

TABLE OF CONTENTS

AN INFLECTION POINT

Technology is evolving at an unprecedented pace and becoming integral to how we work and live.

Increased global connectivity, exponential advances in processing power, the flow and accumulation of data, and rapidly dropping price points are fueling technological innovation at a speed and scale we have not seen before.

In the past, economies have benefited from technology change. But these shifts occurred over decades. Today, the cumulative effect of technology is accelerating progress exponentially.[2] Internet penetration, mobile phones and data availability have skyrocketed, facilitated by the rapidly dropping cost of hardware.[3]

While the impact of change cuts across the workforce, marginalized and vulnerable populations risk a 'double disadvantage.'

This period of rapid technological acceleration brings opportunities as well as challenges. Nowhere is this more evident than in the labor market. Unlike prior technological shifts, which primarily affected low-skilled workers, today's pace of change is impacting the entire global workforce. A 2016 study by the OECD of 21 developed countries suggests that 9% of jobs are automatable, with differences across countries ranging from 6% to 12%.[4] However, across all countries, workers with a lower level of education are arguably at the highest risk of displacement. While 40% of workers with a lower secondary degree are in jobs with a high risk of job automation, less than 5% of workers with a tertiary degree are.[5]

While the extent of the impact on labor markets is still to be determined, what remains clear is that automation may disproportionately affect individuals who are already facing hardship. Populations that are vulnerable or marginalized today could face a 'double disadvantage' in the future, due to a lack of awareness, opportunity or means to adapt to these changes. Without a large-scale reskilling effort, these individuals are at greater risk of technological displacement and unemployment.[6]

The time to act is now.

These shifts require an urgent reimagining of workforce development programs, as well as a readjustment of skills.

One frequently cited estimate suggests that 65% of children starting school that year would one day hold jobs that did not exist at the time of the study.[7] Today, approximately 8 in 10 middle-skill jobs in the US require basic digital skills and digitally-intensive middle-skill jobs are growing 2.5 times faster than their analog counterparts.[8]

FUTURE OF WORK

Factors influencing the digital economy are also redefining what the future of work will look like.

Jobs of the future may look very different. Accenture research has found that 74% of business and IT leaders from 31 countries say their organization is entering areas that have yet to be defined.[9] At the same time, 95% of thought leaders, business executives, NGOs, and influencers in education across Asia, Europe and America believe they need new skills to work and stay relevant.[10]

While it is difficult to predict how jobs will evolve, our research, which draws upon Accenture's 2017 Technology Vision and Digital Disruption reports, among others, has identified four dominant features of work in the digital economy: Digital & Human, Cooperative & Collaborative, Knowledge & Task-Based and Flexible & Fluid (Figure 1).

Figure 1: The Four Defining Features of the Future of Work, Accenture

The future of work has four defining features

DIGITAL & HUMAN   **COOPERATIVE & COLLABORATIVE**   **KNOWLEDGE & TASK-BASED**   **FLEXIBLE & FLUID**

Although each feature represents an individual dynamic, they also overlap and intertwine. The combination and the weighting of these characteristics will vary depending on organizations, sectors, geography and timeframe,[11] but all are fundamental to how the workforce is evolving—particularly for low- and middle-skilled work. Understanding this new reality does not replace the need to prepare beneficiaries for in-demand jobs. Rather, it helps prepare them for their lifetime, beyond the work and jobs we can envision today.

Digital & Human: How tasks will get done

Digital technologies such as artificial intelligence (AI) and robotics are transforming the nature of work and the skills needed to thrive. Humans and machines will increasingly work together to drive productivity. For example, AI could increase productivity by 40% and double annual economic growth rates by 2035 in developed economies.[12] Employees agree, with 82% acknowledging that digital technologies will transform the way they work in the next three years.[13]

Emerging technologies will continue to automate and augment work (Figure 2). They will become our co-workers,[14] generating new work activities and employment opportunities. A recent global survey from Accenture of more than 1,000 companies identified three new types of employment that require collaboration between humans and machines:

Explainers: Interpret the output of AI systems

Sustainers: Optimize the effectiveness of AI systems

Trainers: Feed AI systems' capacity for judgment[15]

Consider the example of Samasource, a nonprofit organization working to reduce global poverty and unemployment through digital work. Samasource's service offerings evolve to meet the latest market demands in Silicon Valley and to support machine learning and computer vision applications. Samasource trains individuals in Kenya, Uganda and India to annotate photographs and video stills, creating a database of digital images that can help machines recognize and interpret our world. The collection of annotated images enables machines to create algorithms for AI. Over the last decade, Samasource has trained and hired over 9,000 workers and impacted more than 35,000 people, raising workers' average daily income by nearly 400% and increasing access to better housing, education and healthcare.

Figure 2: How Artificial Intelligence will change the future of work

AUTOMATION
is the use of technology to complete tasks.

Example 1
Amelia is an AI platform by IPsoft that serves as an all-purpose virtual agent equipped with sophisticated natural language processing capabilities and a built-in robotics facility for taking action on customer requests. On average, Amelia is able to increase productivity by resolving questions four times faster, from 18 to 4.5 minutes. In addition, by escalating queries that Amelia cannot solve to a human colleague, Amelia is able to close knowledge gaps and increase the likelihood of successful resolution.

Source: Alison, Ian. "Artificial intelligence agent Amelia sympathises with you while replacing lost bank cards," May 2016.

AUGMENTATION
is the use of technology to assist in completing tasks.

Example 2
Praedicat provides risk modeling services to property and casualty insurers. By using machine learning and big data processing technologies, the AI platform is improving underwriters' risk-pricing abilities. The AI platform supports underwriters by reading more than 22 million peer reviewed scientific papers to identify serious emerging risks, enabling accurate pricing, and the creation of new insurance products.

Source: The Digital Insurer, "Praedicate make the works a safer place," 2016.

Cooperative & Collaborative: How people will work together

Cooperation is working with others for mutual benefit, and collaboration is a deeper communal effort toward a shared goal. In the digital economy, people will need to cooperate and collaborate with both colleagues and technologies.[16]

New digital technologies are changing how people work together. Tools such as interactive portals and social networking are common features of work, and their use is set to increase. An Avanade survey of business leaders across 15 developed countries found that 77% are already using such technologies, and 82% want to use them even more in the future.[17]

Companies are already leveraging open-source collaboration to solve problems and engage customers. For example, Local Motors, a car manufacturer in Arizona, uses an open digital platform to facilitate co-creation and micro-manufacturing, allowing customers to design their own cars based on designs from more than 30,000 contributors around the globe.[18]

> **Technology is increasing the potential for cooperation and collaboration across multiple platforms, and we need to prepare our young people with the skills to be able to thrive in this new work order.**
>
> **JAN OWEN**
> Foundation for Young Australians

Knowledge & Task-based: What work is done

Work will increasingly be broken into tasks that utilize an individual's unique skills and knowledge areas. Accenture's 2016 Technology Vision report found that 79% of business leaders across industries believe that the future workforce will be structured more by project than by job function.[19]

Organizations are outsourcing projects and tasks to individuals or teams with specialized knowledge and skills relevant to a specific industry and timeframe. Thus, people within and outside organizations are changing projects or tasks regularly. The pathways into work are also changing. For example, task platforms are connecting people with specialized skills to a global marketplace. In the last 20 years, the number of task-based workers has increased by roughly 27%, more than permanent employees on the payroll, according to the Brookings Institution.[20]

The emergence of platforms and the rise of the gig economy are expanding the marketplace. For example, platforms like Upwork and Thumbtack connect employers to skilled workers (e.g., web developers, electricians) to complete knowledge and task-based work.

Figure 3: Projected Increase in Number of People in Task-Based Roles in Australia; Telsyte and Samsung, Activity-Based Working Is Driving Business Outcomes, 2015.

IN AUSTRALIA THE NUMBER OF PEOPLE IN TASK-BASED ROLES IS PROJECTED TO MORE THAN DOUBLE BY 2020

■ Task-based
■ Non-task-based

28% — 2015
66% — 2020
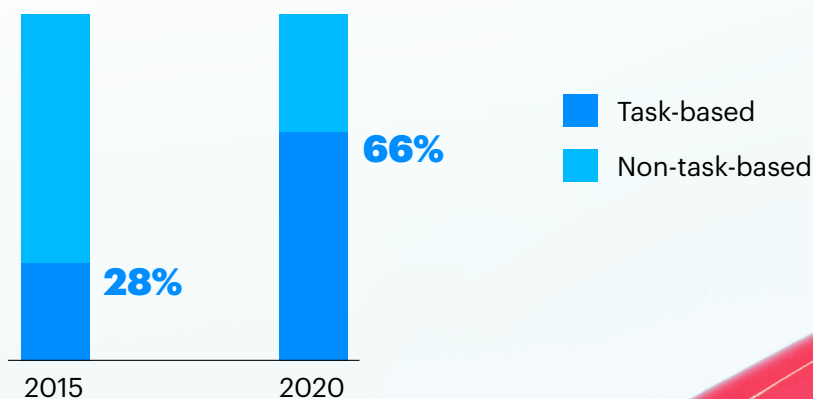
Flexible & Fluid: Where work will be done and how people are employed

Work used to be a place to go to. Now it is a place to which we connect. Technology is uncoupling work from finite hours and locations. Accenture's 2017 Technology Vision survey found that 85% of IT and business executives plan to increase their organization's use of independent freelance workers over the next year.[21]

As the nature of work evolves, individuals are expanding their professional networks by leveraging platforms to access work.[22] For example, mobile applications such as Ubercare, which connects caregivers to on-demand work in Australia, are transforming the global healthcare market.[23] This flexibility is enabling people to increase their income, work part-time, rejoin the workforce or assume new roles. By eliminating geographic and time constraints, flexible and fluid work arrangements will also allow new talent pools to enter the workforce.[24] In 2016, the Association of Independent Professionals and the Self-Employed reported that there were 1.6 million freelancers in the UK and that one in seven were working mothers, who may see freelancing as an opportunity to balance the demands of their family with work commitments.[25] However, concerns around the absence of health and retirement benefits for flexible workforces persist.

> **One job for one employer for life no longer exists. The imminent reality is multiple jobs for multiple employers – all at the same time.**
>
> **Mike Davidson**
> Digital Skills Academy
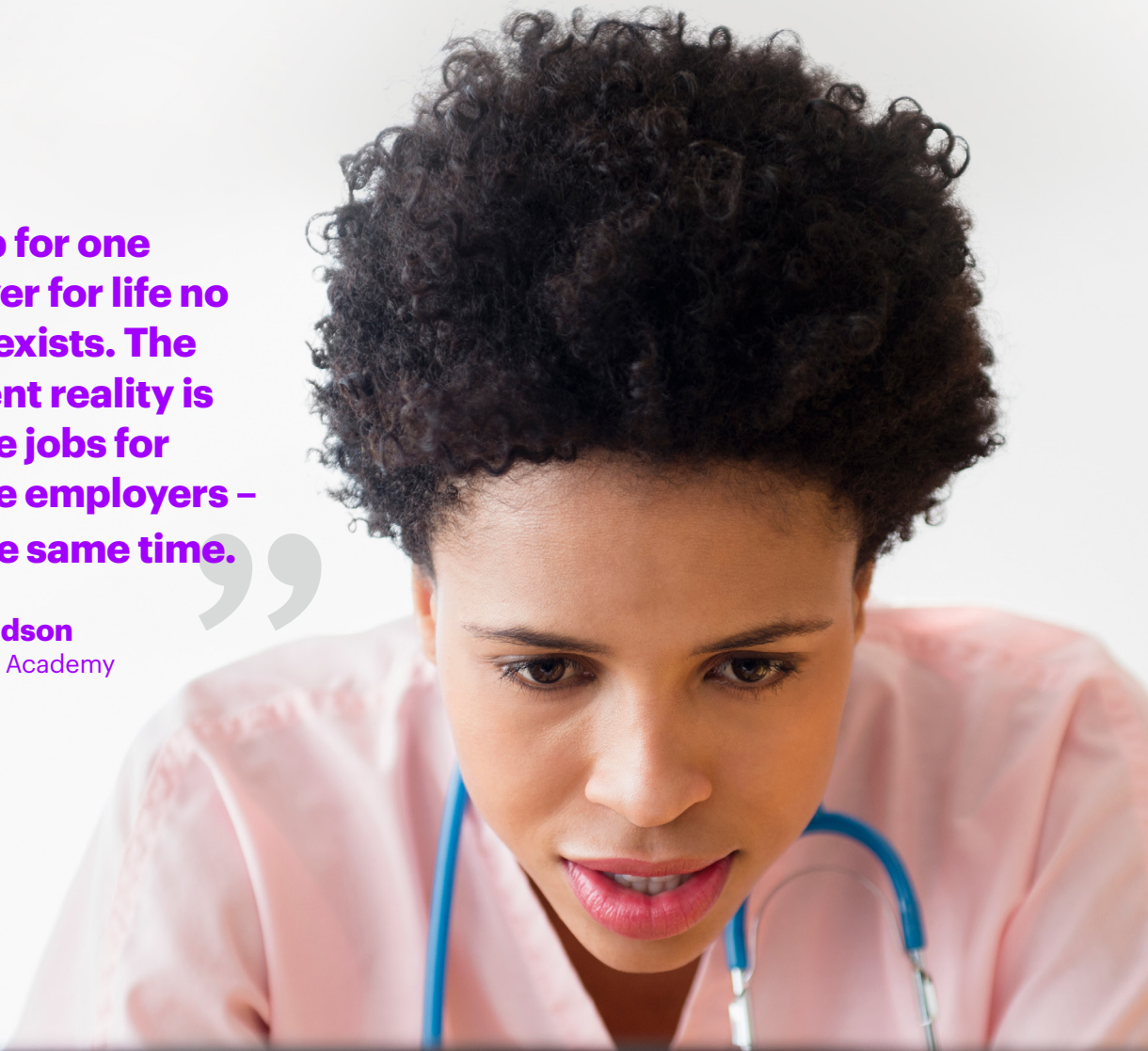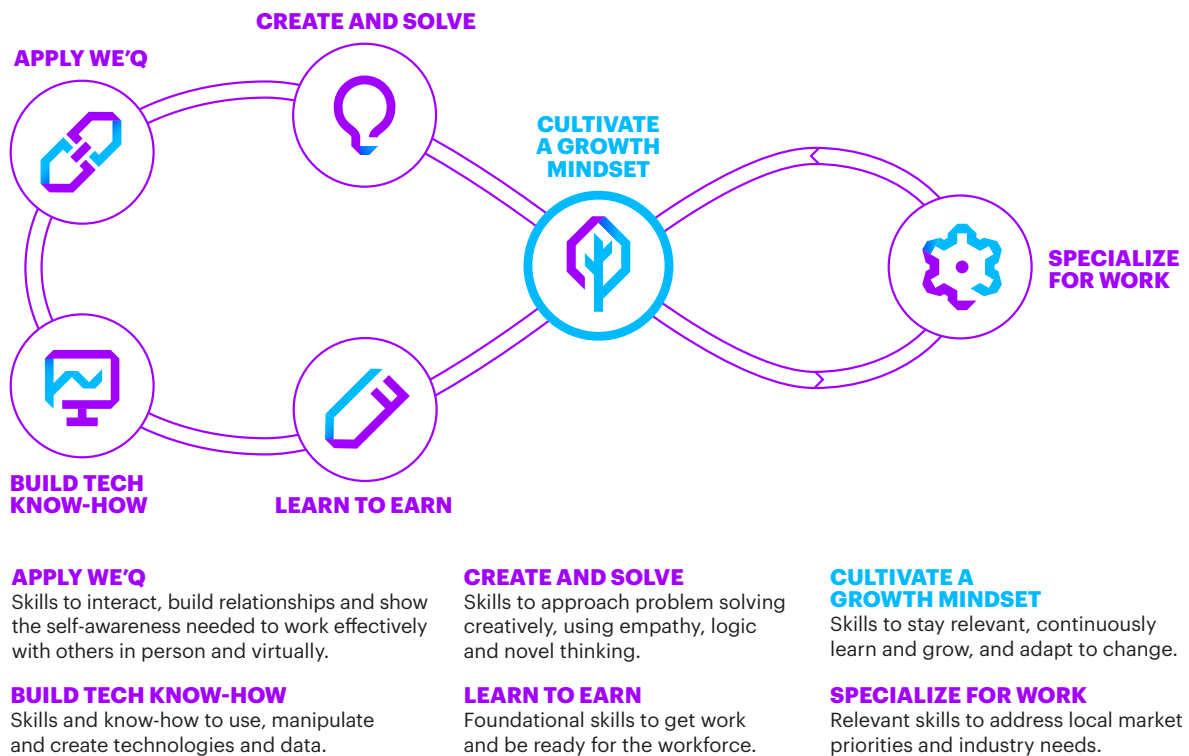
INTRODUCING NEW SKILLS NOW

Learning New Skills Now can help unlock advantages in the digital economy.

As the nature of work evolves, employees and entrepreneurs will need to adapt their mix of skills and knowledge[26] to embrace new challenges and stay relevant.[27]

In addition to a big data analysis of in-demand skill trends, a review of skill frameworks and a landscape scan of 1,000 workforce development programs, we interviewed experts from a wide variety of fields, from neuroscience and corporate learning to education and workforce development. We then used their insights to help identify and categorize both the universal skill families and the underlying cognitive capabilities needed for inclusion in the digital economy.

We call the resulting taxonomy 'New Skills Now,' and the six skills families that underpin it are: Learn to Earn, Build Tech Know-How, Apply We'Q, Create and Solve, Cultivate a Growth Mindset and Specialize for Work (Figure 4).

Figure 4: The New Skills Now Taxonomy, Accenture

APPLY WE'Q
Skills to interact, build relationships and show the self-awareness needed to work effectively with others in person and virtually.

BUILD TECH KNOW-HOW
Skills and know-how to use, manipulate and create technologies and data.

CREATE AND SOLVE
Skills to approach problem solving creatively, using empathy, logic and novel thinking.

LEARN TO EARN
Foundational skills to get work and be ready for the workforce.

CULTIVATE A GROWTH MINDSET
Skills to stay relevant, continuously learn and grow, and adapt to change.

SPECIALIZE FOR WORK
Relevant skills to address local market priorities and industry needs.

CASE STUDY – EMPLEA+: TOGETHER FOR THE EMPLOYMENT OF THE MOST VULNERABLE

Accenture is already exploring ways to embed New Skills Now into existing workforce development initiatives such as Emplea+. Developed in collaboration with the Spanish Ministry of Employment and a cross-sector consortium of nonprofit partners and corporations, Emplea+ is an e-learning solution that helps marginalized individuals develop key competencies needed for success in the digital economy. To date, more than 150,000 beneficiaries across Europe, Asia and Latin America have used Emplea+ to improve their employability, with more than 100,000 reporting significant gains in their performance and ability level. Accenture has gathered and disseminated learnings through Emplea+ that will inform future workforce development programs, including insights on the value of including skill assessment tools, personalizing curricula and clearly defining the skills required for each job.

WHAT'S NEW IN NEW SKILLS NOW?

The six New Skills Now families consist of the cognitive abilities, aptitudes and dispositions needed to stay relevant and thrive in the fast-evolving digital economy, as well as specialized knowledge or craft skills for a specific market, industry or setting.

A dynamic mix of all six skills families is critical to securing a first job or starting a business, and will remain critical to retaining that job, growing that business or navigating to the next opportunity.

Cultivate a Growth Mindset is the linchpin that connects all six skill families; and provides the agility, resilience, curiosity and love of learning required to stay relevant, adapt, specialize and transition in the new economy.

New Skills Now focuses on capabilities that individuals can learn at any age and hone over time. Preparing the next generation of workers for success in the digital economy requires building critical skills early and encouraging continuous learning throughout every stage of life.[28]

- CEO and founder of SharpBrains, Alvaro Fernandez, points out that neurogenesis, the creation of new neurons, continues through adulthood. For these neurons to stick, people need constant mental stimulation.
- According to Dr. Randa Grob-Zakhary, neuroscience researcher and former CEO of Lego Foundation, children develop key skills that equip them for adulthood.[29]

New Skills Now is underpinned by core cognitive functions – brain-based abilities like working memory, emotional self-regulation and focused attention.

These skills are meant to be fostered and reinforced both inside and outside of formal learning environments.

Learn to Earn

Foundational employability and entrepreneurship skills needed to enter the workforce, find a job or start a business

Figure 5: Burning Glass Technologies Data 2017

DEMAND x 3
time management multitasking

WHAT THESE ARE

The Learn to Earn skills family includes literacy, numeracy and digital literacy—the minimum competencies required to locate, evaluate, create, transact and share content digitally. Basic employability skills, conduct and protocols (e.g., learning to maintain eye contact in an interview, listening and time management), as well as core cognitive functions (e.g., focused attention, working memory and sequencing), also fall within Learn to Earn.[30]

WHY THESE SKILLS

Foundational skills remain critical to learning and earning. Jared Chung of CareerVillage.org suggests, "Employability and entrepreneurial skills are often the gateways to participating in high-quality jobs that are decently compensated." An analysis of job postings reveals that demand for key employability and entrepreneurship skills has tripled since 2010 (Figure 5).

Gayatri Agnew of the Walmart Foundation says, "The technical skills associated with [occupation] competencies are changing faster than the curriculum can be updated. What's not changing is that you have to be able to multitask, prioritize and be able to read and write."

Central to learning is self-efficacy, the belief in one's ability to acquire knowledge and to proactively regulate one's behavior to achieve goals.[31] Studies show that self-efficacy accounts for about 14% of the difference between students' performance.[32]

As work becomes increasingly digital, Learn to Earn skills will assume even more importance. Previous Accenture research confirms that for individuals to remain relevant and keep pace with new technologies, digital literacy should be taught from an early age and reinforced throughout adulthood.[33] However, these skills are too often assumed. Kris Pawluk from Google's European Growth Engine program says, "We take for granted that people know how to use IT skills, to look online or write an email, but many don't. Everyone will need them to move forward."

> ## "Interpersonal judgment and social dynamics are going to be the hardest things to train machines how to manage."
>
> **Anita Woolley**
> Carnegie Mellon University

LEVEL OF SKILLS MASTERY

Foundational	Medium	Master
• Digital literacy • Focused attention • Numeracy • Reading comprehension • Self-efficacy • Working memory • Writing	• Employability basics • Organization • Time management • Prioritization • Sequencing	• Business conduct and protocol • Job searching (e.g., resume writing and interviewing skills)

New Skills Now in Action: Learn to Earn

Tools of the Mind

Blending neuroscience research and make-believe play, Tools of the Mind encourages children to develop the cognitive skills needed to become better learners. One aspect of the curriculum is Play Plans, where children learn to plan their play by drawing what they are going to do and with whom. Afterwards, they learn to follow through and reflect on the plan. After just one year of use, 80% to 90% of three- and four-year-old students at Long Branch Public Schools (New Jersey, USA) showed strong levels of literacy. This program is currently in use by over 30,000 students across the United States.

Tools of the Mind

Accenture Skills to Succeed Academy

The Accenture Skills to Succeed Academy combines digital literacy with key skills for employability and entrepreneurship. Learners engage in a highly interactive 45-hour online training program that takes a new approach to the job seeking journey, while building learners confidence to make career choices and develop skills. The free program targets 15 to 24-year-old job seekers and is currently based in the United Kingdom, Ireland, South Africa, Australia and US. Since its launch, the program has reached 100,000 beneficiaries, more than 70% of whom say their employability skills have improved.

Accenture Skills to Succeed Academy

Build Tech Know-How

Skills and know-how to use, manipulate, work with and/or create technologies and data

Figure 6: Accenture Skills of the Future Survey 2017

Ability to manipulate digital tools will become critically important in the next

5 YEARS

according to Accenture Survey

WHAT THESE ARE

The Build Tech Know-How skills family includes the ability to use digital devices and platforms to analyze, explore and share data and to work effectively alongside machine intelligence. This requires an understanding of how technology and data can be built, manipulated and applied.

WHY THESE SKILLS

Technology and data skills are no longer solely the purview of experts. Eighty-five percent of our New Skills Now interviewees believe that the ability to use digital and emerging technologies will remain or become critically important in the next five years and beyond (Figure 6).[34] Giustina Mizzoni from CoderDojo says, "Digital competence is crucial whether or not you're going to work in technology." Nearly all occupations and businesses will have a digital component in the future. Business executives have publicly acknowledged the importance of basic data analysis and their expectation that jobs requiring these skills will grow by 30% in the next seven years.[35]

Jim Bessen, an economist and lecturer at Boston University, states, "People who work well with new technologies will see their wages grow; people who do not will be left behind." Over the last 200 years, as workers developed relevant skills for the time, technological advancements have been responsible for a tenfold increase in wages.[36]

> " I think what's important for a nonprofit is that they are not just using digital technology to make their skills training more efficient at scale, they are also teaching their learners digital competencies they need to succeed in the workforce.... core to the skills that learners need to be successful in work. "

Gayatri Agnew
Walmart Giving

LEVEL OF SKILLS MASTERY

Foundational	Medium	Master
• Awareness of and ability to use professional tools and programs • Awareness of data sources and applications	• Coding • Content creation • Data interpretation • Understanding of professional tools and programs' functionality	• Analysis and application of data • Graphic and visual design • Software design

New Skills Now in Action: Build Tech Know-How

Bit Source

Headquartered in Kentucky's coal country, Bit Source designed a 22-week interactive training course dedicated to preparing former miners and industry support workers for the digital economy. Coal to Code capitalizes on the high-tech skills of the mining industry's displaced workers to design, develop and deploy websites, applications and software. Founder Rusty Justice saw an opportunity to develop a curated reskilling program for these workers, whose jobs required "the same level of tech just dirty." In its first 22 weeks, Coal to Code successfully trained 10 workers, who are thriving in the job market and supporting a cumulative 69 commercial projects.

Bit Source

Code to Inspire

Code to Inspire offers a meaningful, scalable approach to addressing poverty and gender inequality in underserved communities by providing technology skills to populations historically excluded from the digital labor market. The organization's hallmark program helps women and girls in Afghanistan develop entrepreneurial skills through online courses in computer science and coding. This program helps move participants to financial and social independence. Currently, more than 50 women and girls ages 15 to 25 participate.

Code to Inspire

Apply We'Q

Skills to interact, build relationships and show self-awareness
to work effectively with others in person and virtually

Figure 7: Burning Glass Technologies Data 2017

Communications and customer service
have risen to **two of** the

TOP 3 SKILLS

in job postings over the last three years

WHAT THESE ARE

The Apply We'Q skills family consists of teamwork, collaboration, communication, social and emotional intelligence, and the ability to manage others, as well as cognitive functions such as self-regulation which allows individuals to understand, control and adapt their emotions and behaviors in a team environment.[37]

WHY THESE SKILLS

As work becomes increasingly collaborative and task-based, social and relationship-building skills are gaining importance. These skills have always been in high demand among employers and are equally crucial to running a business.[38] In fact, Accenture Research found that over the last seven years, communications and customer service skills have remained among the most desirable in job postings across the United States (Figure 7). With the rise of electronic communication and virtual workforces, these skills must be fine-tuned.

Teamwork and collaboration will remain vital to success in the workplace. In his long-range analysis of successful teams, Alex Pentland at MIT persuaded workers to wear an electronic badge that monitored the tone and range of their interactions over time. The data suggested that the success of teams had much less to do with experience, level of education, gender balance or personality than with a single factor: "Does everybody talk to each other?"[39]

"**We hear continuously from employers that to be successful in the workplace, an individual has to know how to work on a team.**"

Celina Morgan-Standard
New York Academy of Sciences

LEVEL OF SKILLS MASTERY

Foundational	Medium	Master
• Collaboration • Communication • Listening • Self-control • Teamwork	• Active listening • Emotional self-regulation • Mindfulness • Negotiation • Self-awareness • Social intelligence	• Delegation • Leadership • Management of direct reports and supervisors • Service mindset • Storytelling

New Skills Now in Action: Apply We'Q

Ashoka

Ashoka's Changemaker School Districts is a global network of school districts working to reimagine and transform education by empowering children, administrators and teachers to drive positive change in their communities. School districts achieve success by leveraging Ashoka's unique Changemaker Education Framework to redefine their curriculum, mindset, systems and culture. The framework emphasizes four skills: empathy, teamwork, leadership and creative problem solving. Ashoka has also adapted the model for application across the entire education ecosystem, to help mobilize and engage teacher training colleges, teacher unions, universities, companies and parents.

Peppy Pals

Without the use of text or language, Peppy Pals undertakes the ambitious task of teaching emotions, empathy and friendship through award-winning e-books and apps that embed learning into interactive sequences for kids. They are one of the first companies in the world to take this approach to gamified emotional intelligence for kids. In the world of Peppy Pals, kids interact with five gender neutral animal friends in situations that are founded on real life experiences. The company leverages Affectiva's emotion recognition technology to better help children understand, identify and express their emotions. Peppy Pals is based in the Nordics and has sold more than 400,000 books across 150 countries.
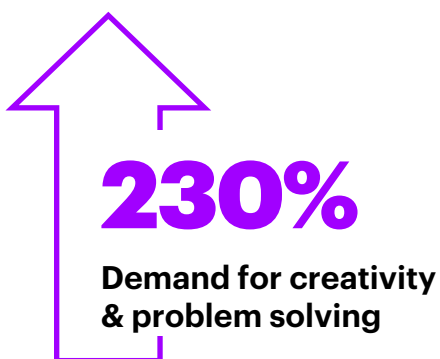
Ashoka

Peppy Pals

Create and Solve

Skills to approach problem solving creatively, using empathy, logic and novel thinking

Figure 8: Burning Glass Technologies Data 2017

230%

Demand for creativity & problem solving

WHAT THESE ARE

The Create and Solve skills family consists of creative problem solving, critical thinking, reason and logic to assess and analyze problems, and an entrepreneurial mindset. This skills family also includes cognitive functions such as decision making and the ability to plan and execute a goal.

WHY THESE SKILLS

As work boundaries become more fluid and challenges more complex, the concept of problem solving is changing. Although simple problems may be solved through automation and human intelligence, critical thinking and reasoning will remain crucial when addressing complex problems. In the digital economy, individuals must look beyond hierarchical or narrow functional approaches to identify, reframe and creatively solve problems.[40] This requires thinking unconventionally and gathering ideas from diverse sources. In this context, design thinking becomes even more important. Rebecca Winthrop of the Brookings Institution observes, "Skills that complement technology will be less likely to be automated by technology." As more tasks are automated, there will be a premium on what machines cannot replicate—the inherently human skills of ingenuity and creativity. Demand for Create and Solve skills has been increasing in North America since 2010 (Figure 8), and research suggests this trend will continue. In fact, 40% of respondents in the World Economic Forum's Future of Jobs survey expect demand for this skill to grow.[41]

Overall, the workforce experts we interviewed rated Create and Solve as one of the most critical skills family for workers and entrepreneurs today and into the future. Tom Goodwin, Executive Vice President of Innovation at Zenith Media, argues, "Increasing the value that humans will have as a differentiator from automation will enhance our ability to deal with chaos in creative ways and join the dots in nonlinear ways."

> **We need people who are not just very narrowly trained in their discipline but we need people who can think outside the box and can think critically and get creative.**
>
> **Rebecca Winthrop**
> Brookings Institution

LEVEL OF SKILLS MASTERY

Foundational	Medium	Master
• Basic problem solving	• Decision making	• Analysis and synthesis
• Creativity	• Judgment	• Critical thinking
• Empathy	• Logical reason	• Design thinking
	• Planning and execution	• Entrepreneurial mindset

New Skills Now in Action: Create and Solve

MindSumo

MindSumo dismantles the traditional approach to solving business problems by directly connecting over 300,000 college students from around the world to businesses seeking to identify opportunities and address challenges impacting them. The platform allows companies to present their challenge to members of the college student community, who then submit ideas and solutions. Through this process, students develop problem definition and problem solving skills. A recent survey found that 75% of students who use MindSumo hone existing skills, while nearly 45% acquire a new skill. To date, more than 3,000 university students have submitted responses to over 1,000 challenges from 400 companies, including more than 75 of the Fortune 500.

MindSumo

Olabi

Headquartered in Brazil, Olabi is an innovative makerspace where people of all ages gather to learn how to create, solve problems and develop solutions for social and environmental impact. Allowing failure and encouraging creativity by bringing together thinkers and doers makes Olabi's space unique. Olabi teams have created projects related to robotics, AI, digital manufacturing and design. Over the past two years, the organization has reached more than 20,000 learners across 20 countries and five continents.

Olabi

Cultivate a Growth Mindset

Skills to stay relevant, be agile and curious, continuously learn and adapt to the pace of change

Adaptability to become top skill
IN 10 YEARS
according to interviewees

WHAT THESE ARE

The Cultivate a Growth Mindset skills family includes the ability to cultivate curiosity, openness, a growth mindset and the capacity for lifelong learning. Underpinned by the cognitive function of flexibility these skills are building blocks for personal resilience and the ability to cope with and adapt to change.

WHY THESE SKILLS

In the digital economy, work will no longer be restricted to one employer, job or team. People will need to constantly learn new skills to remain relevant in the workforce of the future, and a growth mindset will be critical to success.

Demand for candidates who take initiative has increased almost 300% in job advertisements since 2010, and 92% of interviewees rated adaptability as one of the top skills needed in the future (Figure 9).[42] Giustina Mizzoni, who pioneered the CoderDojo network of free computing clubs for young people around the world, says, "Adaptability is the most important skill—one that we should be cultivating. If you are an adaptable and resilient person, you will be able to change quickly and meet the evolving needs of the world."

Much of society has yet to grasp how the digital economy will affect the workforce. The Pew Research Center found that only 54% of working Americans believe they will need to develop new skills throughout their career to keep up with workplace changes.[43] Analysis of existing frameworks shows that Cultivate a Growth Mindset skills are often overlooked, and interviewees confirmed this omission.

Instilling a love of learning early is critical, perhaps above anything else, if people are to thrive as the economy and labor market evolve. In her 2012 book, Mindset, Stanford Psychology Professor Carol Dweck suggests, "In a growth mindset, people believe that their most basic abilities can be developed through dedication and hard work... this view creates a love of learning and a resilience that is essential for great accomplishment."

> **"Lifelong learning is key to keep up. People need to stay relevant, adapt to trends, and keep training and evolving.**
>
> **Kris Pawluk**
> Google

LEVEL OF SKILLS MASTERY

Foundational	Medium	Master
• Curiosity • Flexibility • Motivation to learn • Openness • Optimism • Receptiveness to change	• Adaptability and continuous learning • Agility • Grit and perseverance • Imagination • Zest	• Ability to give and receive feedback • Global mindset • Growth mindset • Resilience

New Skills Now in Action: Cultivate a Growth Mindset

LEAP Skills Academy

Through market driven skilling, industry relevant content and innovative techniques, Learning Employability and Progress (LEAP) Skills Academy provides life-long learning skills to help bridge the skills gap between students and industry in India. Most recently they launched Propeller, a school program that aims to spark curiosity and resilience through experiential learning, such as entrepreneurial challenges, guest lectures and community impact events. LEAP has trained over 5,000 students and partnered with over 40 employers to hire program graduates.

LEAP Skills Academy

SkillsFuture

The SkillsFuture platform is a government led, national movement in Singapore to connect citizens with skilling courses and accredited trainers, while building a culture of lifelong learning and perseverance. One program, Future@Work, prepares workers for the future using bite-sized learning modules aimed at cultivating an innovative, resilient, change-ready mindset. In 2016, more than 126,000 Singaporeans earned credit through over 18,000 courses.

SkillsFuture

Specialize for Work

Relevant specialized craft skills to address local market priorities and industry-specific needs

WHAT THESE ARE

The Specialize for Work skills family comprises the broad set of skills required to specialize for different types of work. The skills in this family are not static or fixed and will need to continuously change based on context, industry, market demand and type of work.

WHY THESE SKILLS

The need for specialized, timely and market-relevant skills is essential for any type of work or entrepreneurial venture. However, as jobs and opportunities continue to shift in the digital economy, the specialized skills required to get ahead in those areas will continue to change. This means that the expectation in Specialize for Work should be one of continuous learning to skill, reskill and adapt. For example, in 2016, Accenture embarked on a company-wide initiative to upskill its workforce on New IT. Within 18 months more than 150,000 practitioners became conversant in New IT through immersive digital and classroom learning, combined with field work.

From Accenture's Skills to Succeed initiative, we know that Learn to Earn and Specialize for Work skills are critical to helping marginalized and vulnerable individuals find their first job. However, in combination with the other five skills families, they prepare beneficiaries to advance, reskill and progress to the next job or business.

> **"As the half-life of work skills becomes increasingly shorter, individuals must continuously acquire new skills. A learning mindset, curiosity, motivation, openness to receiving feedback and change, willingness to take risks, a proactive mindset, self-discipline, perseverance and collaboration are the fundamentals of the 'human operating system' we need to navigate rapid technological change in the digital economy."**

Guy Halfteck
Knack

New Skills Now in Action: Specialize for Work

AT&T

The AT&T Workforce 2020 initiative is taking on the ambitious task of retraining 100,000 members of its workforce that may be under-skilled or displaced by 2023. AT&T saw a growing demand for software and engineering related jobs. Rather than looking outside their company, they decided to invest $1 billion toward building new learning resources, new facilities and a dedicated team to lead worker retraining. Many of AT&T's workers are being reskilled in new specializations, including Scrum and data science.

EdX

EdX is an online nonprofit learning initiative created by MIT and Harvard that aims to increase access to high quality education for everyone, everywhere. Currently, they offer 13 corporate and university-recognized certifications and 15 professional certificate programs to help people develop specialized skills in fields such as software development and data science. These programs provide learners with a more immediate path to advancement in their career or help position them for a new job. EdX already serves a community of over 10 million learners from all around the world.

AT&T

EdX

DIGGING DEEPER: LESSONS FOR PROGRAM DESIGN

Our research and analysis uncovered areas for further development, as well as three core principles that are critical to the successful design and development of New Skills Now programs.
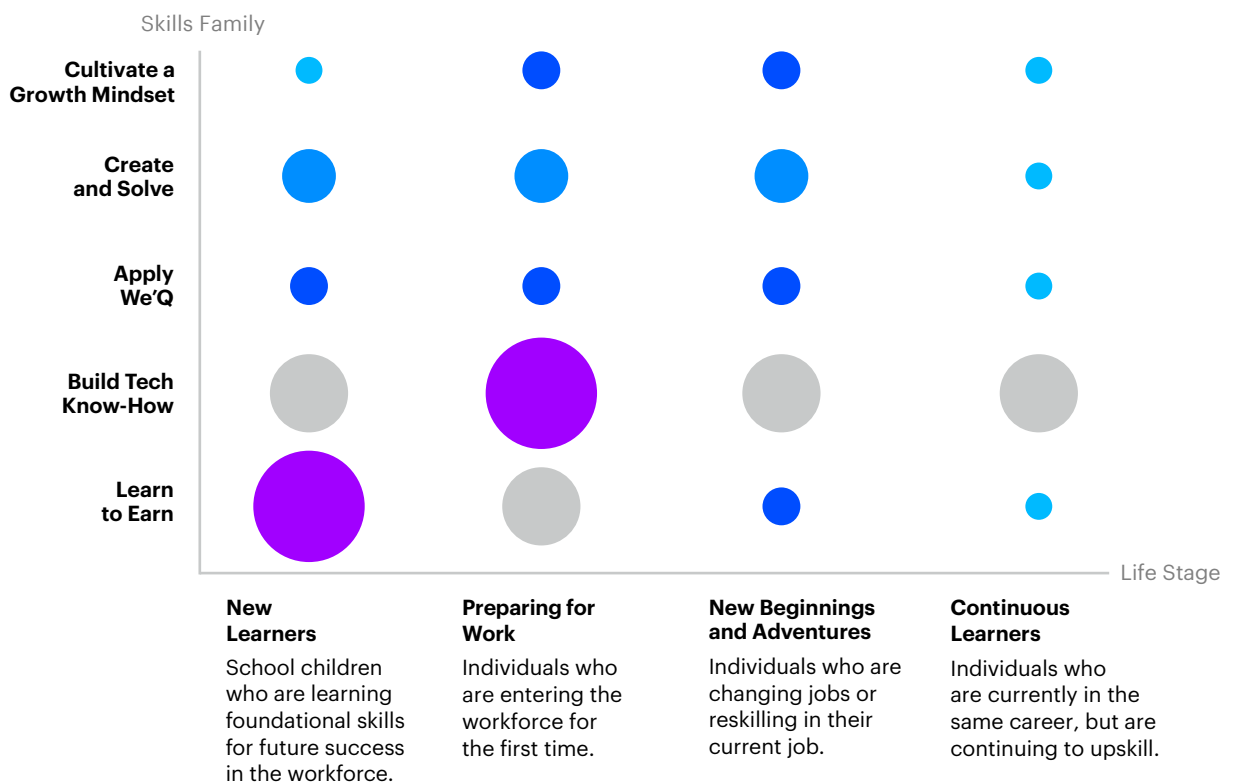
MIND THE GAP

We conducted a landscape scan of 1,000 workforce development programs to identify existing models that embody New Skills Now and to understand where gaps exist (Figure 10).

We also compared the skills family emphasized by each intervention to the life stage that each intervention focused on: New Learners, Preparing for Work, New Beginnings and Adventures and Continuous Learners.

Figure 10: New Skills Now Map of 1,000 Workforce Development Programs, Accenture Research

INTERVENTION CONCENTRATION BY LIFE STAGE AND SKILLS FAMILY

Skills Family

Cultivate a Growth Mindset			
Create and Solve			
Apply We'Q			
Build Tech Know-How			
Learn to Earn			

Life Stage

New Learners
School children who are learning foundational skills for future success in the workforce.

Preparing for Work
Individuals who are entering the workforce for the first time.

New Beginnings and Adventures
Individuals who are changing jobs or reskilling in their current job.

Continuous Learners
Individuals who are currently in the same career, but are continuing to upskill.

Our research revealed that there is an opportunity to develop and support additional interventions for workers at later stages in their careers (New Beginnings and Adventures, as well as Continuous Learners) who may be vulnerable to displacement as the economy changes. Fifty-eight percent of the workforce development programs we assessed focused on early intervention, while 42% focused on individuals in later life stages.

There is also a significant opportunity and need for workforce development programs to focus on cultivating a growth mindset. Less than 1% of the interventions we assessed focused on this skills family, despite its importance for navigating rapid technology change.

DESIGN PRINCIPLES

Cross-referencing the landscape scan with our expert interviews revealed three design principles critical to successful New Skills Now programs (Figure 11).

Figure 11: Key Design Principles, Accenture Research

INNOVATIVE PROGRAM DESIGN

New approaches to workforce development

DURABLE LEARNING

Using science and learning principles to make it stick

CONTINUOUS EVOLUTION

Adapting programs to the evolving work landscape

Innovative Program Design

Faster, larger-scale and creative approaches to skilling are needed for workforce development programs to meet the demands of the digital economy. Celina Morgan-Standard from the New York Academy of Sciences says, "Using project-based, or inquiry-based learning as a tool to tap into a student's interest is key... Project-based learning is really at the core [of learning New Skills Now]." Traditional learning models are too passive to establish critical skills. Programs must involve practice spaced over time to create memorable mental models."[44] Emerging technologies also hold great potential to disrupt and increase the efficiency of traditional methods of delivery. A Research & Markets report, for example, forecasts that the use of AI in the US education sector will grow at a 48% CAGR between 2017 and 2021.[45]

Durable Learning

It is not enough for skills to be adaptive; they also need to stick. Dana Koch, Accenture's Learning Strategy & Innovation Lead, drew on insights from neuroscience, cognitive psychology and education to design the Durable Learning Model (Figure 12). The model demonstrates that durable learning programs share eight elements. They are relevant, engaging, delivered in context, effortful, generative, social, practiced and spaced.[46] Durability also means that skills can be applied long after they are learned.

Figure 12: Accenture Durable Learning Model, Accenture

RELEVANT	ENGAGING	CONTEXT	EFFORTFUL
It's right for the learner. It's at the right time. Builds on prior knowledge.	Gets and keeps the learner's attention. Inspires and motivates. It is active and focused.	Provides big picture. Connects to existing knowledge and mental models.	Hard is good. Demands emotional investment. Failure with feedback is the norm.
GENERATIVE	**SOCIAL**	**PRACTICED**	**SPACED**
Learner reflects. Learner elaborates in their own words.	Engages groups of people. Allows for co-creation of content.	It's spaced – not crammed. Interleaved with other practice. Varied and relevant.	Distributed over time. Requires retrieval. Right-sized.

Continuous Evolution

Successful learning and workforce development programs embed robust monitoring and evaluation systems to ensure that their interventions remain relevant and effective over time, even in the face of technological change. Access to timely data on labor market needs and employer skill demand helps organizations keep pace with these changes. In our 2016 research report, Pathways to Employment, Accenture determined that up to 65% of workforce development practitioners believe staying ahead of market skill demand results in higher placement rates.[47]

# ANTICIPATING SHIFTS IN DEMAND: SIX PERSONAS

The New Skills Now taxonomy identifies the skills needed for inclusion in the digital economy across a wide variety of sectors and professions.

To understand the demand profile for New Skills Now and how it may change over the next five to 10 years, we engaged employers to map what they consider in-demand skills across six job types. Together we created six 'personas': Software Tester, Clerical Worker, Supermarket Cashier, Aged Care Worker, Entrepreneur and Truck Driver and rated the anticipated skill-level that these personas would need for each New Skills Now family.

These six personas were selected based on a variety of factors, including share of global employment, expected impact of technology and relevance to Skills to Succeed beneficiaries. Although each role will require at least a basic proficiency across all six skills families, the level of mastery will vary depending on the role (Figure 13).

Figure 13: Level of Skills to Thrive Tomorrow by Persona, Accenture

SKILLS FAMILY MASTERY
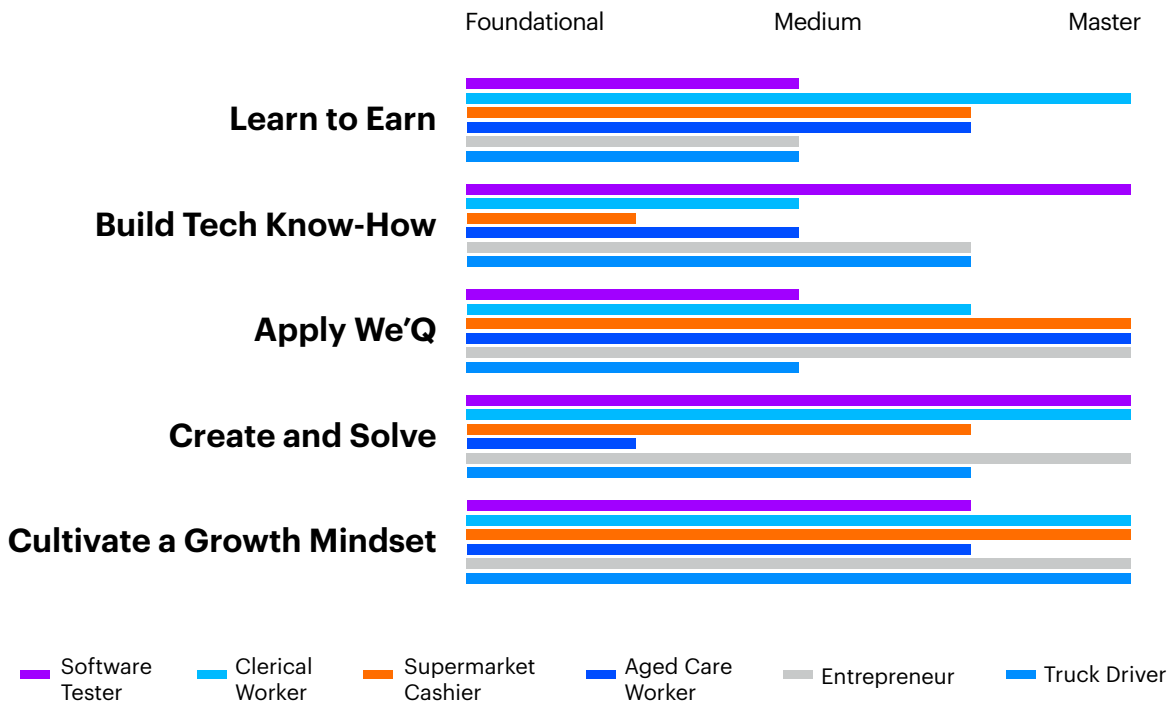
Software Tester

EVA

Profession: Functional Test Engineer

Country: India

Age: 37

According to NASSCOM, the global software testing outsourcing market is expected to grow from $30 to $50 billion from 2010 to 2020, with India projected to be the biggest beneficiary. Testing will increasingly be complemented by the use of intelligent digital tools, and testers will need to be trained in the capabilities of different automation tools, as well as how and when to use them. With the automation of routine tasks, the work of software testers will shift from prescriptive testing to iterative and exploratory testing.

ANTICIPATED TASK AND SKILLS SHIFTS

	Today	Tomorrow (next 5-10 years)
Work	• Eva designs, plans and creates test cases and scripts. She manually tests software for defects, analyzing and prioritizing those she finds. • If Eva discovers a defect that needs a code fix, she will send it to software development. • Little understanding of the product and its architecture is required.	• Eva will oversee continuous technical testing rather than prescriptive functional tests. She will manage intelligent automated exploratory tests to spot anomalies in software. • Eva will work with programmers to complete software development and validate strategies that enable more rigorous automation. • Increased use of automation and analytics may enable Precision Testing, allowing Eva to know where to focus time and energy. • Rather than working for one employer, Eva may use online platforms to find work with multiple employers. Eva must be able to function in diverse team environments.
Skills	• Eva needs to use technology, demonstrate logical problem solving skills and interact with others.	• Eva will need to revive her technology acumen to understand software and to analyze the quality and risks of different products.

LEVEL OF SKILLS TO THRIVE TOMORROW

	Foundational	Medium	Master
Learn to Earn		●	
Build Tech Know-How			●
Apply We'Q		●	
Create and Solve			●
Cultivate a Growth Mindset			●
Specialize for Work			●

Sources: IDC, 2014 Worldwide Software Developer and ICT-Skilled Worker Estimates; Bureau of Labor Statistics, Occupational Outlook Handbook; Medium, The Future of AI Looks Nothing Like Software Development (As You Know It), 2015; 2013 NASSCOM Report Research & Intelligence on Software Testing

Clerical Worker

MICHAEL

Profession: Clerical Worker

Country: UK

Age: 44

In the UK, administrative and support services jobs make up 9% of the workforce. Clerical workers' traditional tasks will be augmented or automated by technology, with artificial intelligence beginning to serve as a digital assistant and improving task efficiency. As administrative tasks become increasingly automated, clerical workers will spend more time managing complex data and providing personalized advice.

ANTICIPATED TASK AND SKILLS SHIFTS

	Today	Tomorrow (next 5-10 years)
Work	• Michael assists multiple executives by preparing documents. He often sets up meetings and records minutes. • Michael uses ERP systems to complete invoices and payments. • Michael conducts research, compiles data and prepares papers.	• Michael may move away from having one employer and start performing clerical tasks for multiple employers via the gig economy. • Michael will complete diversified tasks each day, such as website design. • AI systems will help Michael make decisions, such as analyzing which payment provider to use. This will leave more time to interpret data and provide advice. • Michael will integrate new technologies into his routine.
Skills	• In addition to organizational and communication skills, Michael's job requires a high level of digital literacy.	• Michael will need additional skills to complete these new tasks, including agility, problem solving and technology skills.

LEVEL OF SKILLS TO THRIVE TOMORROW

	Foundational	Medium	Master
Learn to Earn			●
Build Tech Know-How		●	
Apply We'Q			●
Create and Solve			●
Cultivate a Growth Mindset			●
Specialize for Work		●	

Supermarket Cashier

PAVEL

Profession: Supermarket Cashier
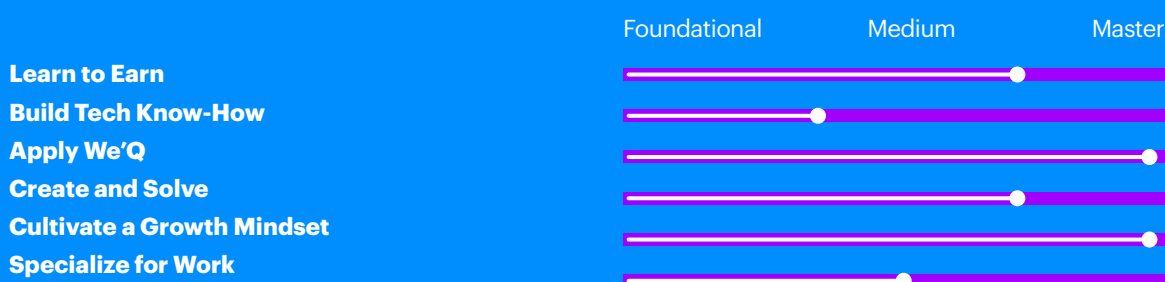
Country: United States

Age: 26

There are 3.5 million cashiers in the United States, approximately 867,000 of whom work in supermarkets. The introduction of the self-checkout is transforming supermarket cashier roles. The shift to automation is already creating new roles such as personal shoppers and self-checkout hosts, which will require the use of technology to provide personalized assistance and additional customer service. In the United States, Walmart has already hired 13,000 self-checkout hosts.

ANTICIPATED TASK AND SKILLS SHIFTS

	Today	Tomorrow (next 5-10 years)
Work	• Pavel's main responsibility is to process purchases. This involves managing queues, financial transactions and customer requests. • In his role, Pavel must use emerging technologies such as point of sales systems, mobile devices and self-checkout machines.	• As technology enables fully-automated checkouts, Pavel will likely transition into the new role of self-checkout host. • In this role, Pavel will continue to manage customer requests but will also oversee multiple registers and mobile device checkout systems. He will need to be able to trouble shoot and help customers use these technologies. • Pavel will have more time to move around the store to help customers. He may explore becoming a personal shopper for online customers.
Skills	• Pavel needs customer service and communication skills to handle requests and complaints. He also needs digital literacy to use the sales system, mobile devices and self-checkout machines.	• In addition to his existing customer service skills, Pavel will need new skills to adjust to the shifting work environment, including growth and agility skills and enhanced data analysis and technology skills, which will allow him to fully use the new technologies and channels.

LEVEL OF SKILLS TO THRIVE TOMORROW

	Foundational	Medium	Master
Learn to Earn		●	
Build Tech Know-How	●		
Apply We'Q			●
Create and Solve		●	
Cultivate a Growth Mindset			●
Specialize for Work	●		

Sources: Bureau of Labor Statistics, Occupational Outlook Handbook; Walmart Interview 2017

Aged Care Worker

LAURA

Profession: Aged Care Worker

Country: Australia

Age: 29

In Australia there are 11.4 nurses per 1,000 inhabitants, and demand for health care workers, particularly for the elderly, is growing. The Aged Care Industry Information Technology Council has found that the Australian aged care industry will need to grow by almost 200,000 workers between 2010 and 2025. As the elderly population grows, aged care workers will need to leverage the latest medical technologies to provide personalized care.

ANTICIPATED TASK AND SKILLS SHIFTS

	Today	Tomorrow (next 5-10 years)
Work	• Laura provides direct aged care to patients and community members, helping with daily activities such as personal care, domestic care and community access. • Laura often uses paper-based record keeping to log her daily activities with patients.	• While continuing to provide social interaction and daily support to patients, Laura will spend more time delivering patient-centered care by using telemedicine to connect with doctors and coordinate care activities. • Laura will use data from wearable technologies on a day-to-day basis to monitor wellness information about her patients and arrange her daily schedule to meet their needs. • Laura will use digital tools for record keeping, administration and communication. • Laura may start using digital tools such as care crowdsourcing tools to find work.
Skills	• Laura's job requires key skills, including communication, social intelligence, relationship building, multi-tasking and organization.	• Laura will need new skills to complete these tasks, including the ability to access and use data anywhere, anytime, as well as growth and agility skills to keep up with technology change.

LEVEL OF SKILLS TO THRIVE TOMORROW

	Foundational	Medium	Master
Learn to Earn		●—	
Build Tech Know-How		●	
Apply We'Q			—●
Create and Solve	—●		
Cultivate a Growth Mindset		●	
Specialize for Work			—●

Entrepreneur

JON

Profession: Part-time Entrepreneur

Country: Global

Age: 20

As the workforce becomes more flexible, more people are pursuing independent or freelance work. Sixty-two percent of millennials around the world intend to start a business before 2026. JP Morgan Chase found that by 2020, more than 40% of workers, most of them young adults, will be entrepreneurs—whether they are self-employed independent contractors, freelancers in the gig economy or small business owners.

ANTICIPATED TASK AND SKILLS SHIFTS

	Today	Tomorrow (next 5-10 years)
Work	• Jon works part-time in a design agency and delivers food on the weekends. • He wants to pursue his business idea: to open a design studio. • Jon meets more established entrepreneurs through friends, colleagues and at networking events. He emails them to learn about business.	• Jon will be sourcing freelance design work on a digital platform, while also trying to build his own studio locally. • Jon may hire another apprentice designer to work on projects. He may also use a mentoring platform that connects him with more experienced entrepreneurs for advice. Jon will seek advice on how to handle new regulations, how to maintain customer privacy, and the ethics of using open data. • For Jon, the lines between freelance work and his studio work will blur—both play into his ultimate ambition to be a business owner employing other people.
Skills	• Digital literacy is required to look for new work through online platforms and to leverage social media for marketing and sales. • Jon needs to be organized and open to new ideas.	• Jon will require new skills to complete these new tasks, including a growth mindset to keep learning and navigate change. Jon will also need enhanced communication and social awareness.

LEVEL OF SKILLS TO THRIVE TOMORROW

	Foundational	Medium	Master
Learn to Earn		●	
Build Tech Know-How			●
Apply We'Q			●
Create and Solve			●
Cultivate a Growth Mindset			●
Specialize for Work		●	

Sources: Huffington Post, The Future Of The Workplace - We Will All Be Entrepreneurs, 2015; JP Morgan Chase, Paychecks, Paydays, and the Online Platform Economy, 2016

Truck Driver

GABRIELLE

Profession: Truck Driver

Country: Brazil

Age: 54

Today, there are an estimated 2.4 million truck drivers in Brazil. Advances in automated transportation systems could mean that these individuals will need to develop new skills to understand, operate and coordinate new high-tech systems. This will allow them to supervise truck routes, track loads and facilitate registration of pick-up and deliveries remotely.

ANTICIPATED TASK AND SKILLS SHIFTS

	Today	Tomorrow (next 5-10 years)
Work	• Gabrielle's main role is to pick up, deliver and unload goods, as well as fill out paperwork for deliveries. • She must clean the truck and report any incidents that occur on the road. • Gabrielle may have additional sales responsibilities (i.e., recommending new products and marketing to new customers).	• As more vehicles become autonomous, Gabrielle will need to build new skills to retain her job. She will facilitate deliveries by coordinating and supervising a convoy of autonomous trucks (on board or remotely). • She will now oversee robotic loading of vehicles, tracking goods using RFID/sensor technology, and facilitating check-in/check-out at origin and destination. • Gabrielle will be highly engaged in autonomous transportation systems, deploying drones from roving trucks to support last mile delivery.
Skills	• Gabrielle uses organizational and communication skills. • She has a physically demanding job (i.e., loading and unloading, driving for long periods of time, lifting, carrying and walking).	• Gabrielle will need new skills to master and coordinate her tasks, including technology know-how skills and creative problem solving skills that will allow her to oversee deliveries and troubleshoot issues.

LEVEL OF SKILLS TO THRIVE TOMORROW

	Foundational	Medium	Master
Learn to Earn		●	
Build Tech Know-How			●
Apply We'Q		●	
Create and Solve			●
Cultivate a Growth Mindset			●
Specialize for Work		●	

CALL TO ACTION

Accenture Corporate Citizenship hopes this report will inspire action to drive critical skills development and prepare workers of all backgrounds for success, today and tomorrow.

To have an impact, we must work collaboratively to develop new ways to teach and learn New Skills Now, sharing, amplifying and replicating what works. For that reason, Accenture Corporate Citizenship is committed to taking the insights from this report and putting them into action with our network of Skills to Succeed partners.

We welcome your input. Share your ideas on how to improve this framework, build New Skills Now and make them stick, and scale programs that will prepare the workforce for inclusion in the digital economy.

Join the conversation: #NewSkillsNow

APPENDIX: SKILLS DICTIONARY

Skills Family	Foundational	Medium	Master
Learn to Earn	• Digital literacy • Focused attention • Numeracy • Reading comprehension • Self-efficacy • Working memory • Writing	• Employability basics • Organization • Prioritization • Sequencing • Time management	• Business conduct and protocol • Job searching (e.g., Resume writing and interviewing skills)
Build Tech Know-How	• Awareness of and ability to use professional tools and programs • Awareness of data sources and applications	• Coding • Content creation • Data interpretation • Understanding of professional tools and programs' functionality	• Analysis and application of data • Graphic and visual design • Software design
Apply We'Q	• Collaboration • Communication • Listening • Self-control • Teamwork	• Active listening • Emotional self-regulation • Mindfulness • Negotiation • Self-awareness • Social intelligence	• Delegation • Leadership • Management of direct reports and supervisors • Service mindset • Storytelling
Create and Solve	• Basic problem solving • Creativity • Empathy	• Decision making • Judgment • Logical reasoning • Planning and execution	• Analysis and synthesis • Critical thinking • Design thinking • Entrepreneurial mindset
Cultivate a Growth Mindset	• Curiosity • Flexibility • Motivation to learn • Openness • Optimism • Receptiveness to change	• Adaptability and continuous learning • Agility • Grit and perseverance • Imagination • Zest	• Ability to give and receive feedback • Global mindset • Growth mindset • Resilience

APPENDIX: INTERVENTION CASE STUDY INVENTORY

Skills Family	New Learners	Preparing for Work	New Beginnings and Adventures	Continuous Learners
Learn to Earn	Aflatoun Worldwide	BUILD US	Amal Academy Pakistan	Passerelles Numeriques South East Asia
Build Tech Know-How	Coder Dojo Worldwide	Núcleo Avançado em Educação Brazil	Make it Real Camp Colombia	Data Society Worldwide
Apply We'Q	LEGO Foundation's Six Bricks Worldwide	YARID Sports Development Uganda	Lively Minds Ghana	Union Learn UK and Ireland
Create and Solve	Better World Ed Worldwide	Creative Education Foundation Worldwide	Awethu Project South Africa	Roots Studio India
Cultivate a Growth Mindset	Atal Tinkering Lab India	More Than Words US	HelpUsGreen India	African Entrepreneur Collective Africa
Specialized Skills	Educate! Uganda	Drive Change US	Mentec Foundation South Africa	Coursera Worldwide

APPENDIX: ACKNOWLEDGMENTS

Interviewees

Gayatri Agnew
Walmart Foundation

Philip Alexander
Mentorial

Dipak Basu
Anudip Foundation

James Bessen
Boston University

Rainer Binder
Accenture

Samantha Burton
Mozilla Foundation

Jared Chung
Career Village

Paul Daugherty
Accenture

Mike Davidson
Digital Skills Academy

David Deming
Harvard

Nqobile Dlamini
Africa Code Academy

Dan Elron
Accenture

Svenja Falk
Accenture

Alvaro Fernandez
SharpBrain

Claire W. Gallagher
New York Academy of
Sciences

Meg Garlinghouse
LinkedIn for Good

Tom Goodwin
Zenith Media

Gaurav Gujral
Accenture

Guy Halfteck
Knack

Ellen Helsper
London School of
Economics

Grace Hong
Accenture

Allison Horn
Accenture

Eleonore Iriart
Passerelles Numeriques

Blake Jackson
Walmart

Dana Koch
Accenture

Paul Kofman
University of
Melbourne

Florian Maganza
Google.org

Payton May
Bit Source

Twisha Mehta
Samasource

Giustina Mizzoni
CoderDojo

**Celina Morgan-
Standard**
New York Academy of
Sciences

Rachel Mutch
Foundation for Young
Australians

Ng Hau Yee
Junior Achievement
Singapore

Kris Pawluk
Google

John Perkins
GO ON UK/ Doteveryone

Mohini Rao
Accenture

Laura Roberts
Rockefeller Foundation

Jenny Perlman Robinson
Brookings Institution

Helen Russell
Atlassian

Gislene Oliveira Silva
Insituto ser+

Mark Spelman
World Economic Forum

Jonathan Srikanthan
Atlassian

Stephanie Taylor
Accenture

Parul Tyagi
Accenture

George Westerman
MIT Initiative on the
Digital Economy

Angela Wilkinson
Oxford

Rosanne Williams
Accenture

Rebecca Winthrop
Brookings Institution

Anita Woolley
Carnegie Mellon
University

Prem Yadav
Pratham InfoTech
Foundation

Carly Yoshida
Samasource

APPENDIX: METHOD AND REFERENCE MATERIAL

Method

Our research explored the following questions:

- How are the forces shaping the digital economy **redefining the future of work for vulnerable and marginalized populations?**

- What are the **skills needed to be included** in the digital economy?

- How can these skills be **developed and designed into effective programs?**

To answer these questions, we applied a design thinking approach that involved six key elements:

1 **Literature Scan:** Reviewed wide range of published works and thought leadership including academia, media and corporate research

2 **Data Mining:** Conducted big data analysis of 130 million job postings to understand the demand for skills and recent trends

3 **Meta-Analysis:** Compared 26 leading skills frameworks to look for patterns, trends and gaps

4 **Interviews and Survey:** Spoke with more than 40 leading labor economists, psychologists, educators, third sector leaders, learning and talent development specialists, HR executives and journalists. We asked the group to rate and rank the importance of skills

5 **Workshops:** Ideated with industry leaders to develop and refine the six personas

6 **Deep Dive:** Assessed more than 1,000 workforce development programs to identify models and success criteria

Note on Terminology

There is debate on how to refer to the groupings of skills that we are calling skills families (E.g., character skills, life skills, social and emotional learning competencies, 21st century skills, competencies, new basic skills, soft skills).[48] Workforce development organizations, funders and researchers may use different terms as they see appropriate.

Meta-Analysis: Skills Frameworks Assessed

Accenture: Harnessing the Revolution and Workforce Augmentation Articles

Brooking Institution: Visualizing the Breadth Of Skills Movement Across Education Systems Report

Burning Glass: Digital Skills Gap Report

Center for Literacy, Education & Employment: Equipped for the Future

Deloitte: Future of the Workforce Skills Report

Deloitte: Talent For Survival Report

Digital Learning Labs

Economist Intelligence Unit and Google: Driving the Skills Agenda: Preparing Students for the Future

The European Union Lifelong Learning Program: Network for Soft Skills Innovation for Employment

Emplea+: Together for the employment of the most vulnerable

Foundation for Young Australians: The New Work Mindset Report

Frontier Economics and Accenture: Digital Skills Framework

Global STEM Alliance: STEM Education Framework

GO ON UK: Basic Digital Skills Framework

Institute for the Future for Apollo Research Institute: Future Work Skills 2020 Report

Milkround: A Guide to Soft Skills Report

Mozilla: Web Literacy 2.0 and 21st Century Skills Framework

OECD: Skills Outlook 2017: Skills and Global Value Chains, Enhancing Employability Report

Pew Research Center: The Future of Jobs and Jobs Training Report

Rockefeller Africa Digital Jobs: Catalyzing Opportunities for Youth Report

Singularity Hub: Focus 7 Critical Skills for the Jobs of the Future

Skills to Succeed: Go Digital Report

Tom Goodwin: 'We need to teach our children how to dream.'

World Bank Group: PRACTICE Framework

World Economic Forum: Future of Jobs Report

World Economic Forum: Partners: Multiple Articles on Skills

Notes

1   Lee Rainey, Pew Research Center, Digital Divides –
    Feeding America, February 2017

2   Onward and upward? The transformative power
    of technology, Digital Transformation Initiative,
    World Economic Forum

3   Technological Change from 1995 to 2015, The World Bank

4   Arntz, M., T. Gregory and U. Zierahn (2016), The Risk of
    Automation for Jobs in OECD Countries: A Comparative
    Analysis, OECD Social, Employment and Migration Working
    Papers, No. 189, OECD Publishing, Paris

5   OECD, United States: Back to Work – Improving the
    Unemployment of Displaced Workers, 2016

6   Burning Glass, The Digital Skills Gap, March 2015

7   World Economic Forum, The Future of Jobs,
    Chapter 1 – The Future of Jobs and Skills, 2016

8   Burning Glass, The Digital Skills Gap, March 2015

9   Accenture Tech Vision 2017

10 Accenture, Harnessing the Revolution;
    Creating the Future Workforce, 2017

11 John Boudreau, Harvard Business Review, Work in
    the Future will Fall into These 4 Categories, March 2016

12 Accenture, Why artificial intelligence is the future
    of growth, 2016

13 Accenture, Digital Disruption: Embrace the future
    of work and people will embrace it with you, 2015

14 Accenture, Workforce planning finally gets strategic, 2016

15 MIT Sloan Management Review, The Jobs That Artificial
    Intelligence Will Create, March 2017

16 Ron Ashkenas, There's a Difference Between
    Cooperation and Collaboration, April 2015

17 Avanade, Global Survey: Is enterprise social
    collaboration living up to its promise?, 2013

18 Local Motors Company, 2017

19 Accenture, Humanizing Work Through Digital, 2016

20 Brookings Institution, Tracking the Gig Economy,
    October 2016

21 Accenture Technology Vision 2017, Workforce
    Marketplace: Invent your future, 2017

22 US Bureau of Labor Statistics, News Release, July 2017

23 Aged Care Guide, Carers on demand - Ubercare app
    launched in South Australia, March 2017

24 Samasource, Why Work Matters

25 Economy Watch, Working Moms Picking Freelance
    Flexibility and Family, August 2016

26 Accenture Academy, Proven, cost-effective learning
    solutions for a more versatile workforce and a more
    agile organization, 2013

27 David J. Deming, The Growing Importance of Social Skills
    In The Labor Market, May 2017

28 Norman Doidge, The Brain that Changes Itself,
    Penguin Books, 2007

29 Robert Kanani, The Transformative Power of Play and
    Creativity, Forbes, January 2014

30 Dr. Pascale Michelon, What are cognitive abilities and skills,
    and how to boost them?, Sharp Brains, December 2006

31 Cleary BJ, Zimmerman TJ. Self-regulation empowerment
    program: A school-based program to enhance self-regulated
    and self-motivated cycles of student learning, Psychology in
    Schools 41.5 (2004): 537–550

32 Multon, Brown, and Lent (1991) as cited by Zimmerman,
    Self-Efficacy: An Essential Motive to Learn, Contemporary
    Educational Psychology 25, (2000):82–91

33 Accenture and Girls who Code, Cracking the Gender
    Code, 2016

34 Accenture Corporate Citizenship, New Skills Now
    Survey, 2017

35 Marguerite Ward, Google billionaire Eric Schmidt says this
    is the skill employers will look for in the future, CNBC,
    March 2017

36 James Bessen, How Technology Has Affected Wages for the
    Last 200 Years, Harvard Business Review, April 2015

37 Dr. Pascale Michelon, What are cognitive abilities and skills,
    and how to boost them?, SharpBrains, December 2006

38 Accenture, IQ plus EQ: How technology will unlock the
    emotional intelligence of the workforce of the future, 2015

39 Tim Adams, Job hunting is a matter of Big Data, not how you
    perform at an interview, The Guardian, May 2014

40 World Economic Forum, The Future of Jobs, Chapter 1 – The
    Future of Jobs and Skills, 2016.

41 World Economic Forum, The Future of Jobs, Chapter 1 – The
    Future of Jobs and Skills, 2016.

42 Accenture Corporate Citizenship, New Skills Now
    Survey, 2017

43 Pew Research Center,The State of American Jobs,
    October 2016

44 Accenture internal rubric

45 Research & Markets, Artificial Intelligence Market in the US
    Education Sector 2017-2021, 2017

46 Accenture, Brain Science to make learning stick, 2016

47 Accenture, Insight to Action Paving the Pathways to
    Employment, 2016

48 Duckworth AL and Yaeger DS. (2015) Measurement Matters:
    Assessing Personal Qualities Other Than Cognitive Ability for
    Educational Purposes. Educational Researcher, (44)4, 237-251

About Accenture

Accenture is a leading global professional services company, providing a broad range of services and solutions in strategy, consulting, digital, technology and operations. Combining unmatched experience and specialized skills across more than 40 industries and all business functions – underpinned by the world's largest delivery network – Accenture works at the intersection of business and technology to help clients improve their performance and create sustainable value for their stakeholders. With approximately 425,000 people serving clients in more than 120 countries, Accenture drives innovation to improve the way the world works and lives. Visit us at www.accenture.com.

About Accenture Corporate Citizenship

Corporate citizenship is central to Accenture's vision to improve the way the world works and lives—from closing employment gaps to advancing client sustainability to accelerating gender equality in the workforce. Accenture's global capabilities, digital experience and innovation mindset help develop solutions that address a wide range of societal issues. Together with partners and clients, we focus on creating economic growth, tackling social challenges and promoting environmental sustainability in our communities. Visit us at www.accenture.com/corporatecitizenship