Broadskilling To Prepare Students for Future Work

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ILLINOIS ACTE ANNUAL CONFERENCE

FEBRUARY 13-14, 2020

- Introduction/Background

- The Challenge

- The Broadskilling Framework

- Open Chat – Learn from crowdsourcing

| Education Management | |
| Corporate Training | accenture |

Interests
- Executive Learning Exchange
- ACTE/iACTE
- Student Advocate Role
- Writing/Presenting
- Continuous Learner

Instructional Design

Baseline: 1GC, Rural, DIY expectation

Richard Busby

Richard has a passion to prepare youth for the challenges of future work. His experience with both corporate Talent Development and Education management give him a unique perspective on the early talent development pipeline.

in

IMSA

Director, Project Management Office

October 31, 2019
Future of Work Learning Circle: Automation, will a robot take my job?
Posted in:Future of Work

Session Focus: Teri is interested in talking about upskilling and reskilling, learning agility, and how companies will evolve learning in the age of automation. Bring your thoughts, ideas, examples as we frame up what upskilling and reskilling means and what the implications for L&D.

October 17, 2019
Preparing Students for Future Work
Posted in:Future of Work

Building on previous discussions by focusing on the systems and challenges of preparing youth to be successful in the future of work. We will move from conceptual research to pragmatic experience by sharing what has been shown to work. How do we scale up what works?

October 6, 2018
Building strong pipeline: Let's look at Illinois' #1 High School Talent Pool
Posted in:Future of Work

Hear how IMSA has and is taking bold steps to foster the discoverers, thinkers, innovators and experimenters needed to develop the Talent needed for the future of work

October 4, 2018
Co-design Apprenticeships & Future Workforce Pathways: Corp HR & University Partnerships
Posted in:Integrated Talent Management

We will discuss the untapped opportunities within tuition assistance programs and how to align training and tuition assistance programs to build leadership pipelines about their personal experiences and are least likely to center on experiential learning.
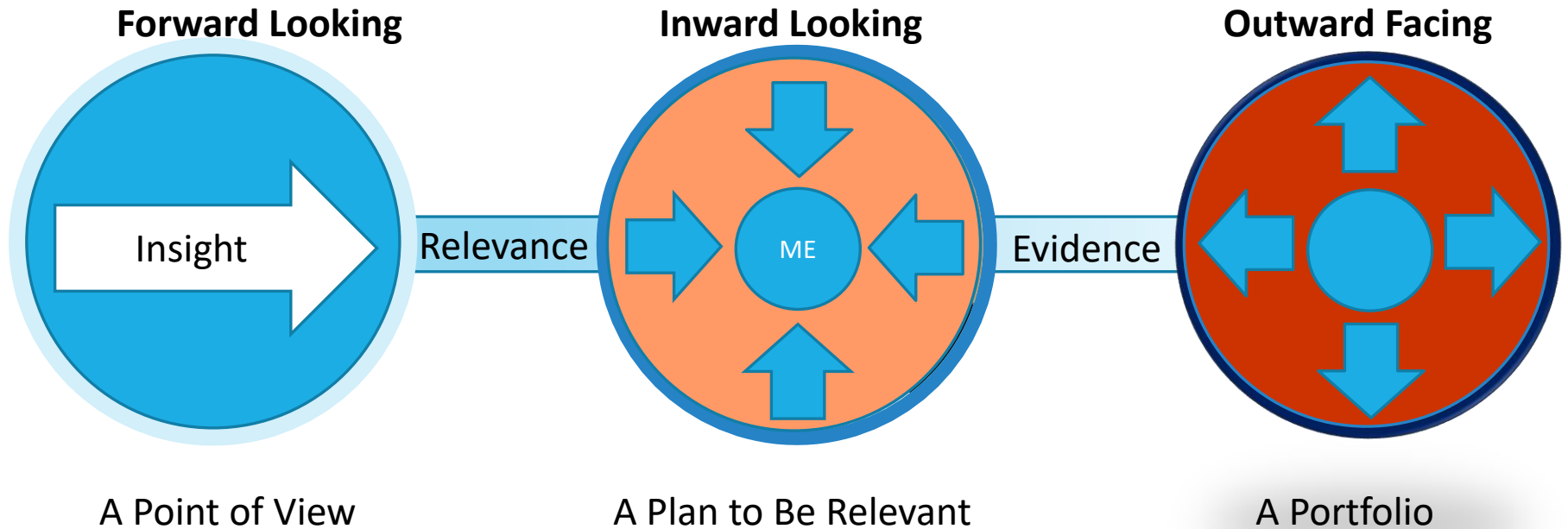
BROADSKILLING

- Few students have a career plan (and if so… it is often vague)

- HR Executives tell me student applicants are not prepared …(who feels the heat?)

- Apprenticeship director story about student gaps, perceptions, and costs of remediation

Lead to the genesis of the *Broadskilling* framework

3 dimensions of student research

Forward Looking

Inward Looking

Outward Facing

Insight

Relevance

ME

Evidence

A Point of View

A Plan to Be Relevant

A Portfolio

Student outcomes

What is the problem?...
The Future is bright! (right?)

OECD Observer

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Rethink policy for a changing world!Check out our latest Economic Outlook, just out!

21st century technologies: a future of promise

An exciting period of technological change lies ahead. But how will these new breakthroughs affect economy and society as a whole and what are their implications for policy?
Wolfgang Michalski
Director, International Futures Programme

The interaction between the evolution of technology and the development of economy and society has always been an important dimension of human history. This applies to the Iron and Bronze Ages as well as to modern times. The transition from the agricultural society towards the industrial society provides the most pertinent illustration of the profound implications which the full diffusion of new technologies can have on family structures, work relations, settlement patterns, economic and

Or is there a downside: Will AI automate my job?

MIT Technology Review

Sign in | Subscribe

Topics   Magazine   Newsletters   Events

Tech Policy / AI Ethics

The AI gig economy is coming for you

The artificial-intelligence industry runs on the invisible labor of humans working in isolated and often terrible conditions — and the model is spreading to more and more businesses.
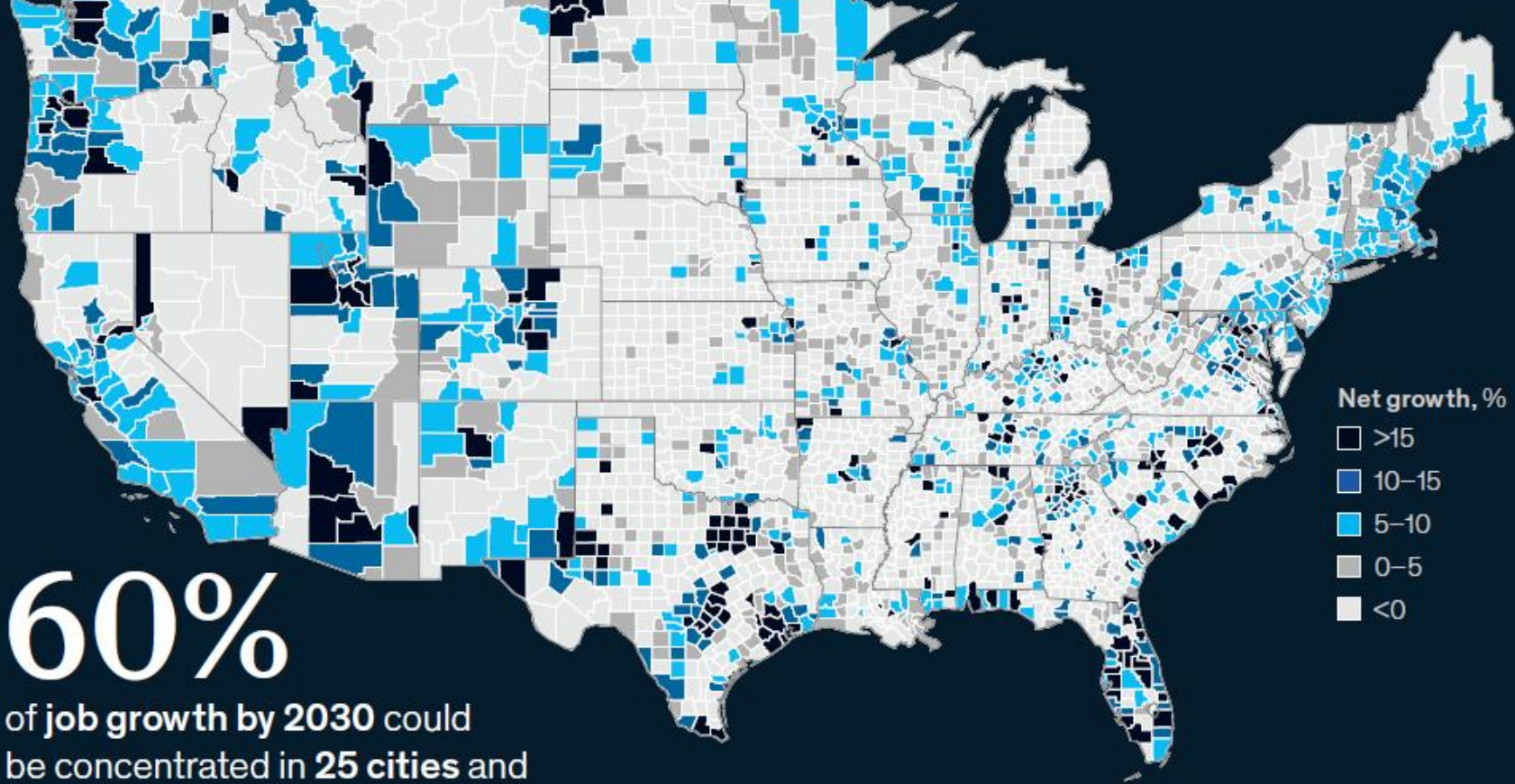
by **Karen Hao**   May 31, 2019

Mary Gray
COURTESY OF HOUGHTON MIFFLIN HARCOURT

"Lights-out automation has been a dream of engineers for more than 200 years. The goal is to push a button and let machines work unattended."
Austin Weber, May 9, 2019
www.assemblymag.com

Net growth, %
- □ >15
- ■ 10–15
- ■ 5–10
- ■ 0–5
- □ <0

60%
of **job growth by 2030** could
be concentrated in **25 cities** and
their peripheries

Potential workforce displacement in midpoint adoption scenario,
2017–30

14.7M
Young workers age 18–34

11.5M
Workers over age 50
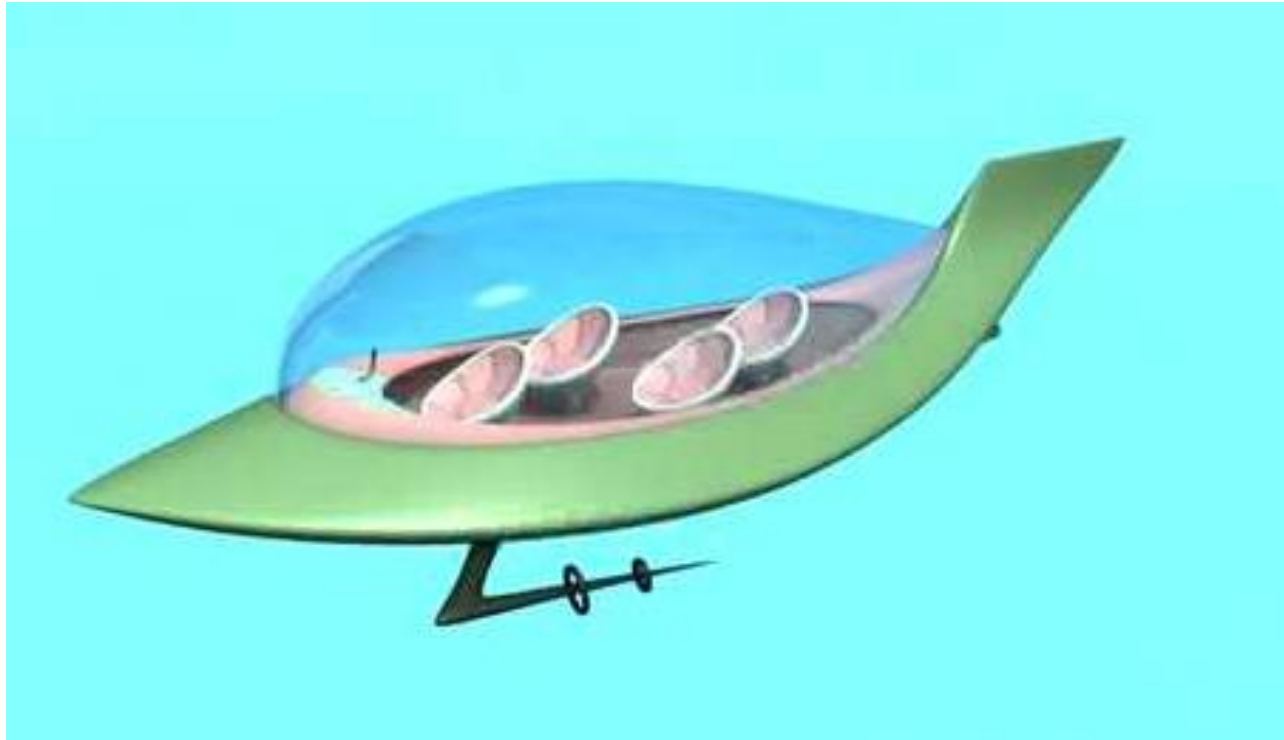
11.9M
Hispanics and
African Americans

4x
Higher displacement
risk for workers with
high school diploma
or less

McKinsey Global Institute

Isn't automation going to reduce human labor and make life easier?

The answer?… maybe
(Our best people are working on it)

"Last year, after throwing in the towel and replacing robots with humans at his controversial factory in Fremont, CA, Elon Musk tweeted that "excessive automation at Tesla was a mistake….**Humans are underrated**."

Austin Weber, **Lights-Out Automation:** Fact or Fiction? Assembly Magazine. May 9, 2019

Digital Transformation

Big Data

Cloud Architectures

Artificial Intelligence

Robotics

Machine Learning

Data Science

Agile management

Contracted Workforce

AR/VR

Advanced Automation

…what's next????

Concurrently, there is a loss of experienced workers

74 Million   Baby boom workforce

41Million   Boomers still working

10,000   Boomers turning 65 daily

20 percent   % of population 65 or older by 2030

1.6M   Teacher retirements: 2011-2021

Skill Gap Impact:
An Illinois Apprenticeship Story

Context: Entry Skills for 4 Year Apprenticeship

	I Need	I Have
Apprentices	150	55
Math Skills	Algebra 1	A Class in Year 1
Soft Skills	Work Ready	To Teach This
Experiences	Tools & Uses	To Teach This
Science	Fluid Dynamics	To Teach This

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- Lack of **self -confidence** in students is a significant barrier in prepping students for jobs
- Completing a **degree** with a few internships **is not enough**
- Students need to be able to **articulate relevant experience & impact** created, on resume and LinkedIn profile

- Students need to create more **evidence of skill**.

- Volunteering experience, teaching, free lance work shows **passion and evidence of skill**

- Employers want to see **work samples** – especially for coding, on platforms like GitHub to demonstrate their work.

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- Schools should be thinking of **partnerships with companies** that offer student work experiences (hackathons, Internships)

- School assignments should be **aligned with real world work.**

- Schools should ask "Are their opportunities to engage corporate partners to **collaborate** on creating relevant school assignments that would prepare students for 21st century jobs?"

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What's been your experience with business partnerships?

Forbes

142,127 views | Nov 29, 2018, 10:53am

Businesses Should Be Leaders In Training Workers

GRADS of LIFE .org **Ramona Schindelheim** Brand Contributor
Grads of Life BRANDVOICE | Paid Program
Leadership

School-Business Partnerships That Work: Success Stories from Schools of All Sizes

BUSINESSES EYE THE WORKFORCE OF THE FUTURE

In Reseda, California, principal Allan Weiner makes a conscious effort to get businesses involved at Cleveland High School. "We have partnerships with Boeing, Wolfgang Puck, Sony, and others," he reported.

"Most business people want to get involved because high school students are their future workforce," Weiner told Education World. To that end, Weiner and his staff have worked to develop a number of programs that aim to interest students in those companies' jobs,
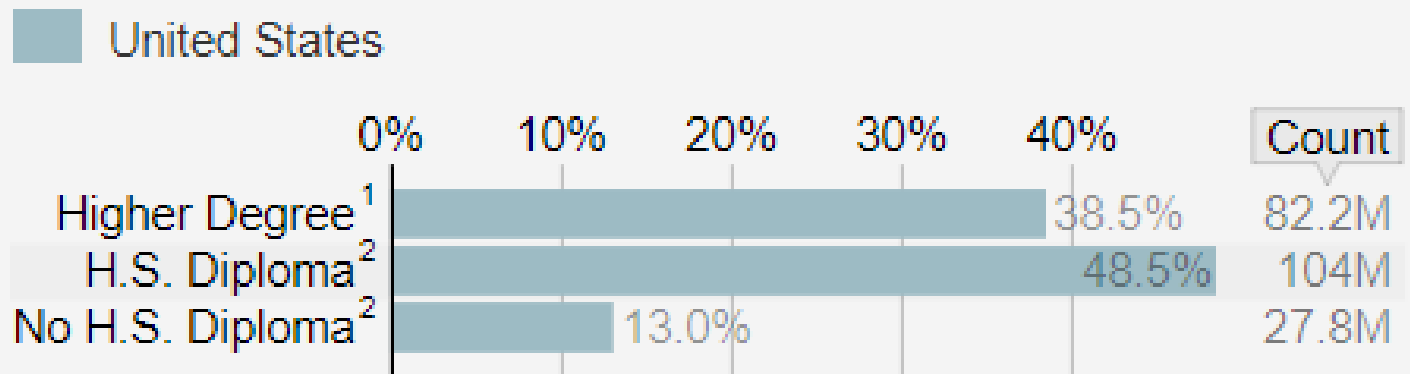
https://www.educationworld.com/

But Workforce Skill Gaps: Are not new

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1917
WORLD PREMIERE AND
ROYAL FILM PERFORMANCE®
RED CARPET COVERAGE STARTS
AT 6PM GMT / 1PM ET / 10AM PST

Skill Gaps:
Nothing New

Conventional Skills	Challenged by Emergent Technology
Bayonet Charges	Automatic Weapons
Cavalry	Tanks
Infantry	Chemical Warfare
Fortified Locations	Airplanes
Shipping	Submarines

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Gaps Emerge In

- People
- Processes
- Technology

Workforce Skills To

- Design It
- Build It
- Operate It
- Fix It
- Manage It

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Is education preparing (enough skilled) students for future work?

51% OF RESPONDENTS SAY EDUCATION SYSTEMS HAVE DONE LITTLE OR NOTHING TO HELP ADDRESS THE SKILLS SHORTAGE ISSUE.

More work needs to be done by organizations and education systems to ensure that the U.S. workforce is prepared for the future of work.

Source: SHRM Research findings in "The Skills Gap 2019"

SKILLS GAP

Addressing the Skills Gap by Identifying, Developing, and Rewarding Lifelong Learners

TODAY, at 2 p.m. EST

Businesses and educators today need to invest in workforce learning and development in order to stay relevant and prepared for a rapidly changing economy. Employers need to work with education institutions to recruit, develop, and retain lifelong learners who have the capacity and desire to upskill and reskill over the course of their careers.

2/11/2020 CLO Magazine/D2L Webinar

September 18, 2019

EDUCATION WEEK

LOGIN

Com

SCHOOLS & THE FUTURE OF WORK

The Future of Work Is Uncertain, Schools Should Worry Now

Source: Education Week. September 18, 2019

HR Perspectives: What are employers looking for in students?

- Market **relevant** knowledge and skills
- Know my industry (be willing to learn)
- Ability to function in the gig economy
- Strong self awareness & soft skills (*Success skills/Power Skills*)
- Expectations that "Learning to Learn" has no "end point"
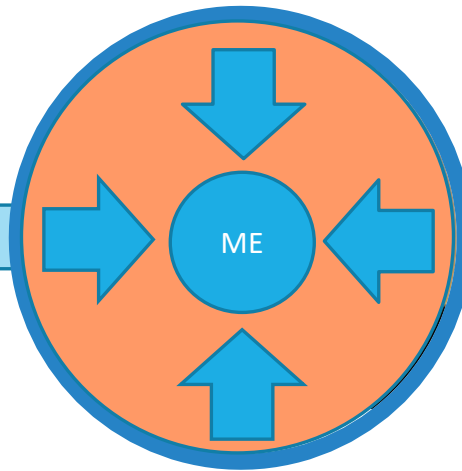- Befriending technology
- **Evidence** of ability to **do** work

Forward Looking: A Point of View

| Dimension	Content
1. Technology	Cloud Architecture, IaaS, PaaS, SaaS, Security
2. Automation	Artificial Intelligence, Machine Learning, Robotics
3. New Models of Work	Gigs, Skills-Based, International Supply Chain
4. Change	Pace, Threats, Shifts in Practice

Future Work:
Content changes rapidly...

Insight

	Low — Pace of Content Change — High
High	

Content Complexity

High complexity, Low pace:
- Whitepaper
- Conference
- Role Based Simulation
- Mentor
- Certification
- ?

High complexity, High pace:
- Expert Network
- Focused Workshops
- On-the-Job Feedback
- AI Augmentation
- ?

Low complexity, Low pace:
- Course/Classroom
- Online Course
- Podcasts
- Books/Audio Books
- BLS Website

Low complexity, High pace:
- Cloud Technologies
- Artificial Intelligence
- Gig Economy
- Pace of Work

Social Media/Follow:
- Heather McGowan
- Jacob Morgan

Low — **Pace of Content Change** — High

Inward Looking

What does it mean to be relevant?

"Do you know what an EC2 Instance is?" ITS Manager

Dimension	Content
1. Soft Skills+	Communication, Collaboration, Feedback
2. Befriending Technology	Personal Assistants, Tools, Following Emerging Tech
3. Entrepreneurial	Project Management, Marketing, Budget
4. Lifelong Learning	Adaptability, A learning plan, Networking

You can be really hot one minute, the next minute be unemployed.
Lane Kiffin, Coach, University of Mississippi

Recommended Reading: Cary J. Green, PhD., Leadership And Soft Skills For Students"
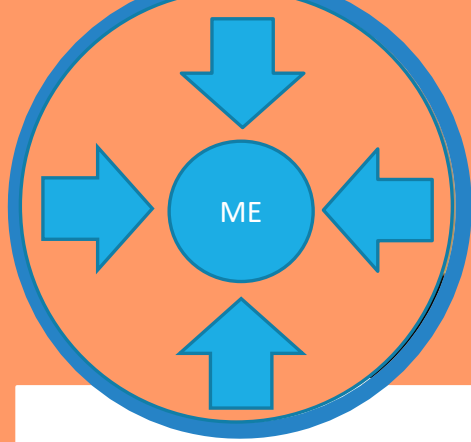
Resource Examples: *Plan to Be Relevant*

READING

- Success Skills: For High School, College and Career

- ACTE Career Clusters

- Gig Economy Statistics (2019)

- Internship vs Apprenticeships

RESOURCES

- Cloud Training/Certifications:
  - Microsoft Azure
  - AWS Training
  - Google Cloud Platform Essentials

- Career Information:
  - CareerOneStop
  - O-Net
  - Occupational Outlook Handbook

- www.Broadskilling.com
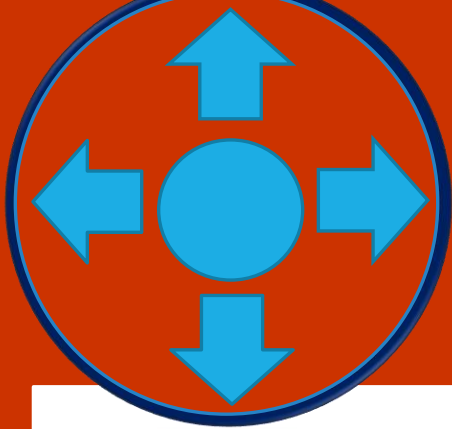
Outward Facing
Where is the evidence of your skillset?

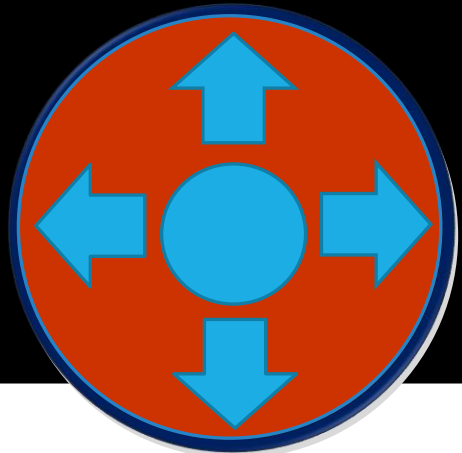| Dimension	Content
1. Social Media Presence	Network profile, Presence, Website, Media, Podcast, Video
2. Work Samples	Portfolio, Apps, Published Work, Deliverables
3. References	Apprenticeship, Volunteer Work, Internship, References
4. Certified Skills	Micro-Credentials, Certified Skills
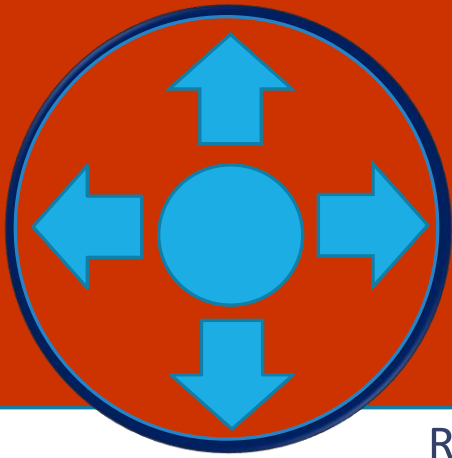
Resource Examples: Evidence of Skill

READING

- Overlooked Value of Certificates and Associates Degrees

- What Employees Want to See on Student Resumes

- High School Resume Examples (2020)

- Business Ideas for Teens

RESOURCES

- Web Portfolio of H.S. Student Work - IMSA

- Hackathon Platforms: Agorize, or DevPost – participate in, or host a hackathon

- GitHub Education– Tech education resources for students and teachers

- 60x25.org (e.g. High School Internship Resources on ioer.ilsharedlearning.org)

Evidence:
Student Work Portfolio

https://digitalcommons.imsa.edu/student_works/

Sample: Student Portfolio

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Application Development Example: GitHub

Time to Crowdsource

- How well is education preparing youth for future work?
  - What's not happening that should?
  - What's happening that should not?

- Do your students know what they want to do?

- Do your students have a plan.

- Are they/should they, be aware of any of the items listed?

- What about students with a specific interest - how do you direct them? Electrician? Construction? Engineer? Manager? Aviation Tech?

- What skills are relevant?

- How can they display their job-readiness skills?

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Future Work: Requires a plan

Ubiquitous, Technology

Workforce Automation

Gig Economy

Uncertainty

Re-Skilling

Up-Skilling

Less Stable Roles & Skills

College?

Occupational Training?

Certificates?

Direct to Work?

It's not always a route to college

"A vast majority of our policies, and most of our departments and agencies, are targeted toward coaxing people toward a four-year degree… There are incredible opportunities for Americans to live and work and do fantastic jobs that don't require four-year degrees…."

Michael Kratsios, Chief Technology Officer of the United States

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Future Work: Youth need awareness and a plan to succeed

Ubiquitous Technology

Workforce Automation

Gig Economy

Uncertainty

Re-Skilling

Up-Skilling

Less Stable Roles & Skills

College?

Occupational Training?

Certificates?

Direct to Work?
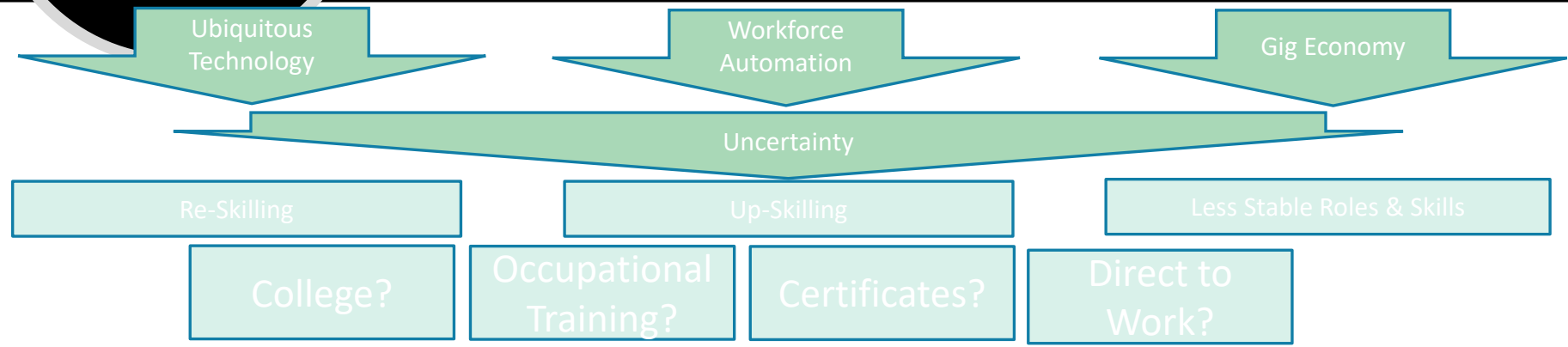
K-12 – The Early Talent Developing Pipeline

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Educators have a narrow window of opportunity

Age 67+

Career

Post-Secondary &/or Workforce Entry

K-12

5

Middle/Secondary

Average Lifespan

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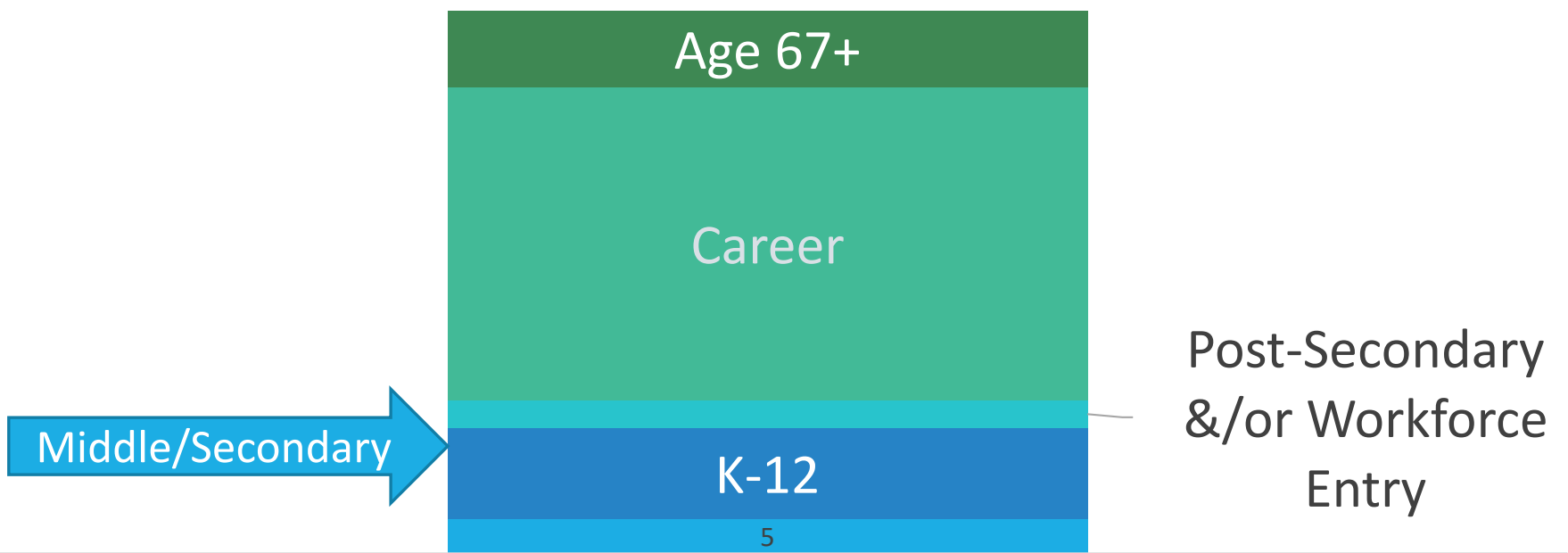
What can students do to prepare for future work?

Near Future Skills

Future Skills

Future Skills

Futu
PAST
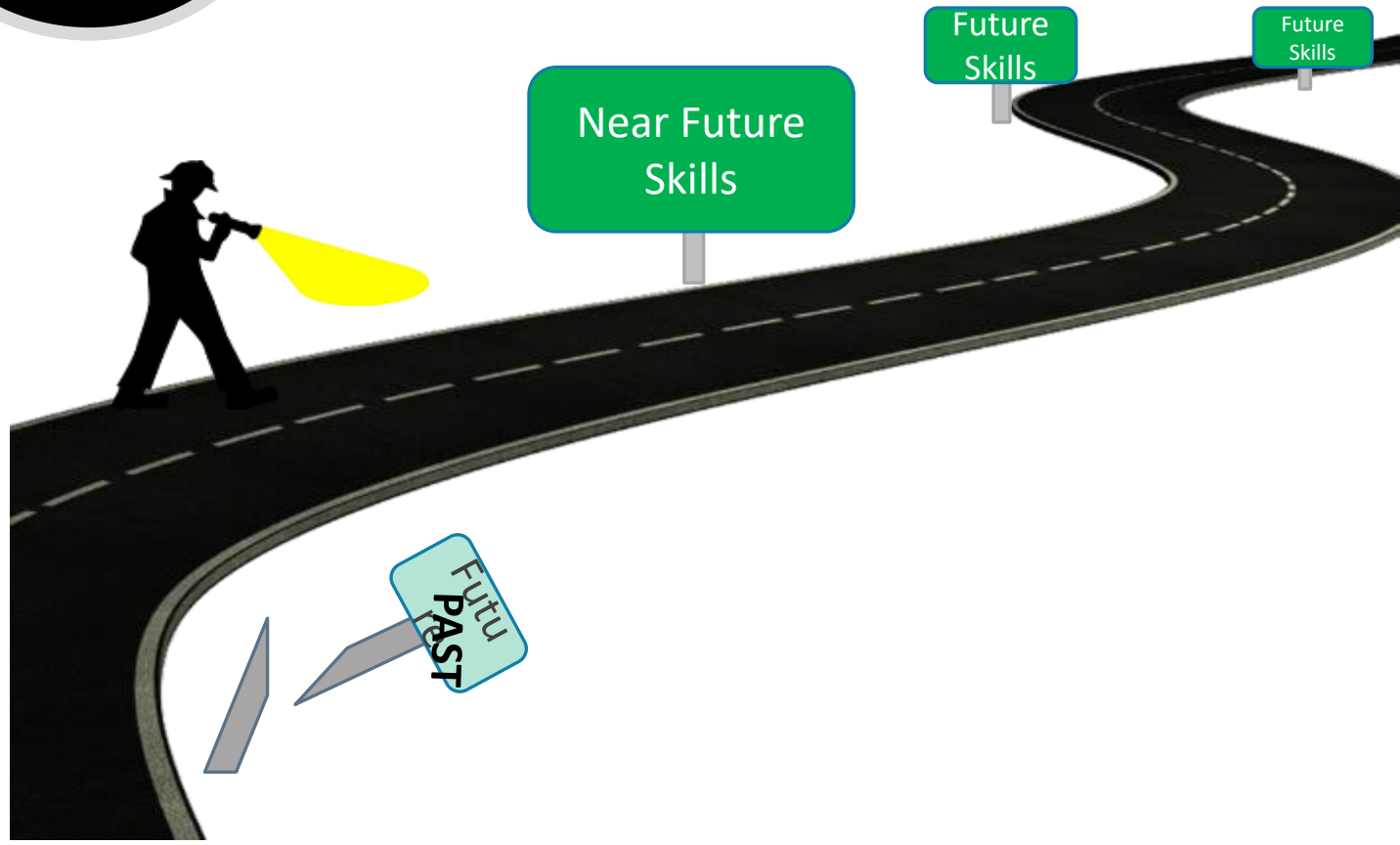
Activity : Open Inquiry Research Project

Inputs	Activity	Output
Guiding Question What forces and trends are shaping the future of work? What skills do I need to succeed in future work? What can I develop relevant skills? What are my aptitudes and interests?	Write a position paper describing the answers you defines, your plan to prepare yourself for a successful like and work?	An informed perspective on the future of work. A self development plan to prepare for success in future work.

Activity : Guided Inquiry Research Project

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Inputs	Activity	Output

• Job Landscape:
    • Career Clusters
    • Occupational Outlook website
    • Industry Verticals
 	
• Emerging Technologies:
• AI, Robotics, Cloud Computing, [insert other]
• Research Template
	Write a position paper describing a personal Broadskilling plan
	1. Select a technology, an Industry & a role of interest.
	2. Research the impact of technology
	3. Identify skills required
	4. Define skill development pathways
		A Plan to be relevant to future work:
		• Perspective about future work
		• A Point of view about relevant skills
		• Pathways to develop relevant skills
		• Tradeoffs (college, trades, certs, OJT)
		• Methods to demonstrate evidence of skill.

• Inventories: Myers-Briggs, Big 5, ASVAB	5. Identify interests & aptitudes	Awareness of aptitudes & career interest

Do a walkthrough/talk through of the guided inquiry research project (if student access to internet or devices to do research is limited)

1. Given the Broadskilling Model and a Research Plan

2. Guided Inquiry: Students will define the scope of their research to:

   A. Broad Scope: Research Future Work, Forces and Trends

   B. Narrow Scope/Student Driven: Student selects one or more of the following, based on their interest:

Free Download of Research Plan: www.Broadskilling.com

Broadskilling:
The Framework is meant to be tailored

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Complexity (Progression: Grade, Age, Complexity)

Graduate · Post Secondary · High School · Middle School · Elementary

Ag., Food, & Natural Resources · Architecture & Construction · Arts, AV Tech, Comms. · ...etc.

Career Awareness
Creating Evidence of Skill
Interpersonal Skills
Sense of Self
Willingness to Adapt
Learning to Learn
Befriending Technology
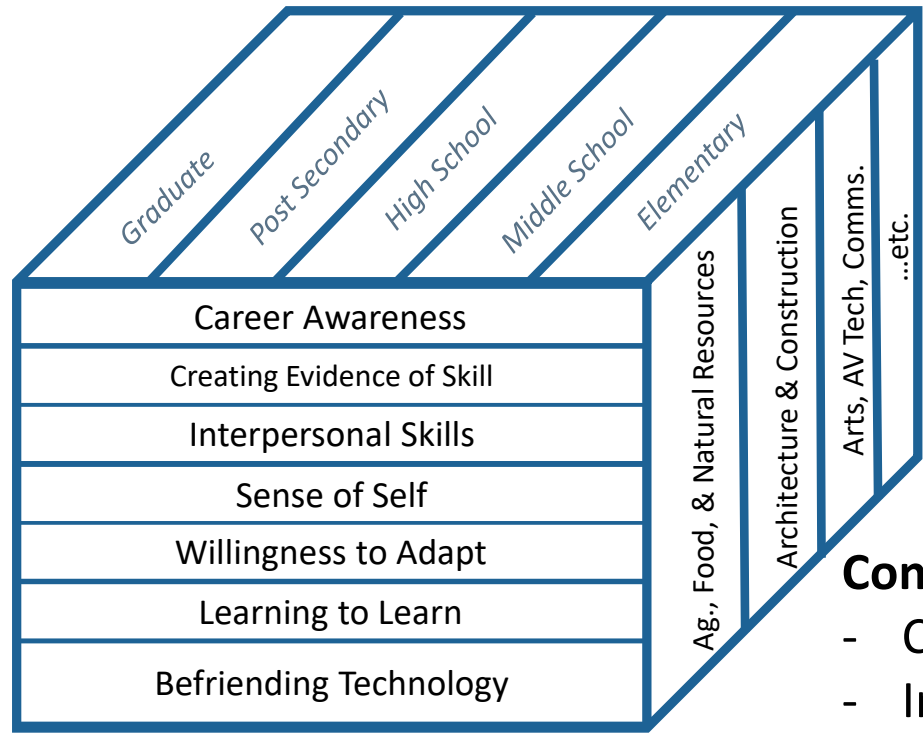
Content
- Role Specific
- Broadskills

Context (Environment)
- Career Clusters
- Industry Verticals

Student Interest Driven

High School Internships – Chicago

- https://www.internships.com/chicago-il

- Gensler High School Architecture Internship: Illinois

- IBM AI Internships: Illinois

- NASA Summer Internships:

- National Institute of Health (NIH)Summer Internships:

- National Cancer Institute:

- Minnesota Trades Academy Summer Internship:

Example: School/Corporate System: The Beechwood EDGE Program

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Appendix

RELATED SLIDES

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- Recommended Reading: McKinsey Global Institute: The Future of Work in America. July 2019

- Definitions:
  - IaaS: cloud-based services, pay-as-you-go for services such as storage, networking, and virtualization (AWS EC2, Google Compute Engine (GCE))
  - PaaS: hardware and software tools available over the internet (e.g. AWS Elastic Beanstalk, Windows Azure, Force.com)
  - SaaS: software that's available via a third-party over the internet (e.g. Salesforce, Google Apps, Dropbox, Mailchimp, Slack)

- What's **NOT** Cloud: On-premise ("On Prem"): Software that's installed in the same building as your business (Onsite management across the enterprise architecture

https://www.bigcommerce.com/blog/saas-vs-paas-vs-iaas/#the-three-types-of-cloud-computing-service-models-explained

Artificial Intelligence and Machine Learning

AI and ML

Artificial intelligence (AI) is the field of computer science that seeks to enable machines to perform tasks associated with the human brain, such as cognition, learning, and problem-solving.

Machine Learning: computer systems are able to perform tasks without explicit hard-coding of instructions. Made possible with AI due to advances in pattern-recognition capabilities of deep learning, a type of machine learning whose deep neural network architecture is somewhat inspired by the biological brain.

Resource: https://www.psychologytoday.com/us/blog/the-future-brain/201907/ai-and-machine-learning-explained-simply

The artificial-intelligence industry runs on the invisible labor of humans working in isolated and often terrible conditions—and the model is spreading...

Karen Hao, artificial intelligence reporter for MIT Technology Review

New Models of Work

Traditional Work was: Education, Profession, Progression, Rewards (Financial & Psychological); New Model of Work: Skills, Roles, Lateral/Vertical Responsibilities, DIY Rewards

Changes

Pace of Change: Moore's Law (now being questioned)… Computing Power Doubles every 2 Years (there is an upper limit – the closer nano-size particles get to "atom", the harder it gets (Latest trends: 3-D computing, Quantum Computing, distance – working on Wetware/DNA computing)

Human Impacts: Brings uncertainty

- Expectations of Accessibility: Can I "Turn Off" when I have personal devices and an expectation of accessibility. Implication: Tradeoffs between money life units (Financial, Psychological, Well-Being)

- Identity: I am a [Job Title] for [Company Name] could be replaced with "I am a [role title] on a [#] Month project for [Company Name].

- Routine vs Constant. Implication: re-evaluation of your position

  - Competency: The next thing is coming, and fast, Implication = Relearning

Resource: https://www2.deloitte.com/us/en/insights/deloitte-review/issue-21/changing-nature-of-careers-in-21st-century.html
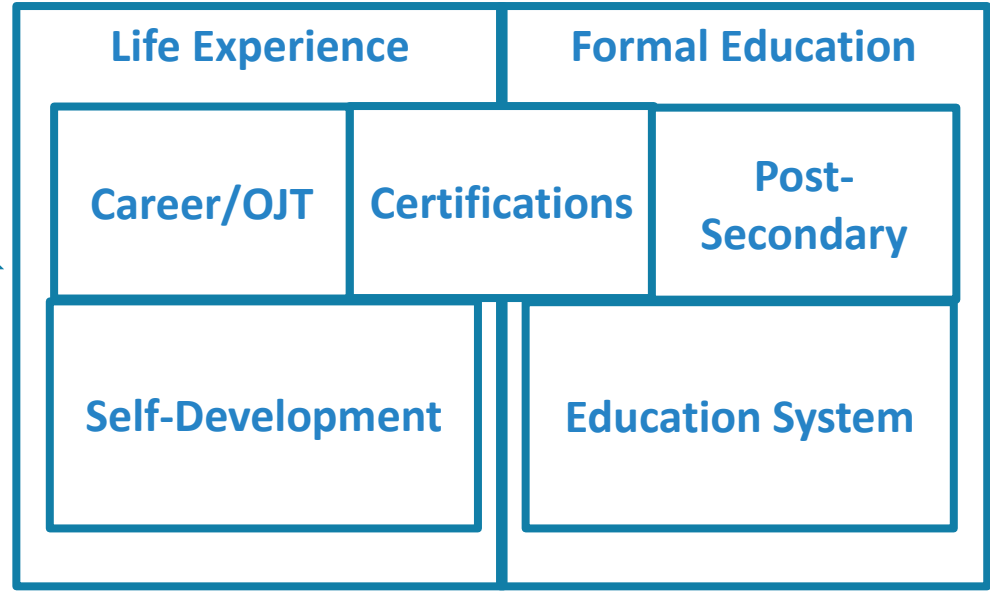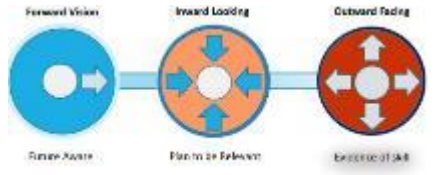
Learning Strategies for Broadskilling

BROADSKILLING

…we call for teaching approaches that encourage individuals to develop a range of both technical and innately human skills….We advocate a greater commitment to experience-based skills development, like on-the-job learning and apprenticeships.

Pierre Nanterme, Former Chairman & CEO of Accenture (Retired 2019)

Educational Attainment

Detailed Educational Attainment #2

Highest level of education among people aged 25 years and older.
Scope: population of the United States

United States

Category	Percentage	Count
Doctorate[1]	1.3%	2.86M
Professional[1]	2.0%	4.26M
Master's[1]	8.2%	17.5M
Bachelor's[1]	18.8%	40.2M
Associate's[1]	8.2%	17.5M
Some College	21.0%	44.8M
High School[2]	27.5%	58.8M
Some H.S.[3]	7.4%	15.9M
Less than H.S.[3]	4.2%	8.87M
None	1.4%	3.04M
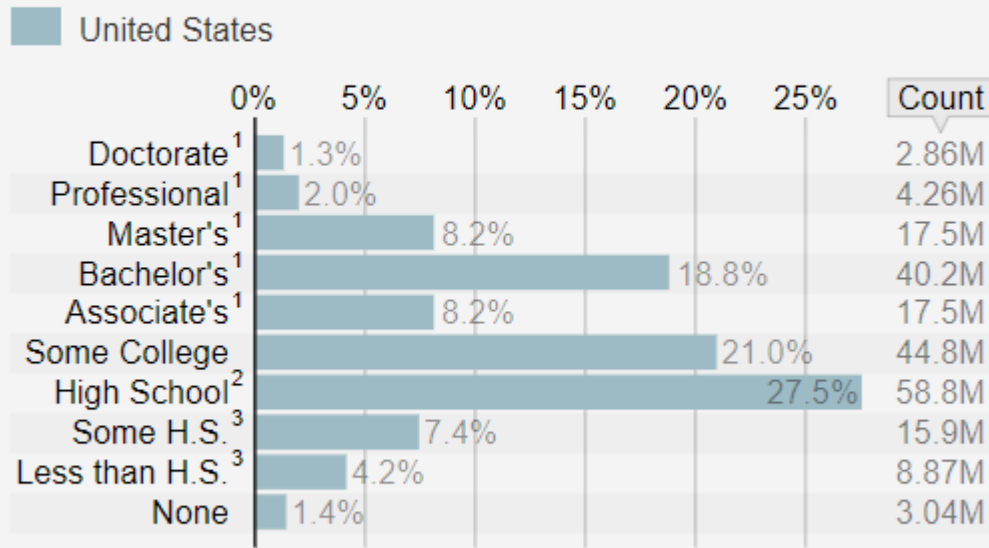
Count number of people in category
[1] Degree   [2] Diploma or equivialent   [3] H.S. = High School

https://statisticalatlas.com/United-States/Educational-Attainment

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Science, Technology, Engineering and Mathematics (STEM) programs of study are:

1. Mathematics and statistics

2. Science technologies/technicians

3. Physical sciences

4. Biological and biomedical sciences

5. Agricultural sciences

6. Engineering

7. Engineering technologies

8. Computer and information sciences

How AI will impact K-12 teachers.
KcKinsey & Company, Jan 2020

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Technology can help teachers reallocate 20 to 30 percent of their time toward activities that support student learning.
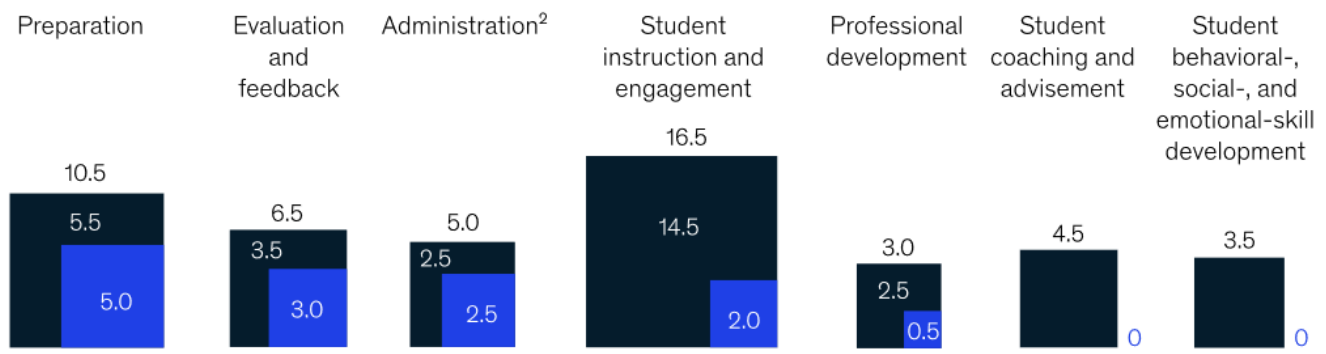
Potential for time reallocation, number of hours per week[1]

■ Reallocatable time   ■ Other working time

Preparation	Evaluation and feedback	Administration[2]	Student instruction and engagement	Professional development	Student coaching and advisement	Student behavioral-, social-, and emotional-skill development
10.5	6.5	5.0	16.5	3.0	4.5	3.5
5.5	3.5	2.5	14.5	2.5		
5.0	3.0	2.5	2.0	0.5	0	0

[1]Figures may not sum, because of rounding. Average for respondents in Canada, Singapore, United Kingdom, and United States.
[2]Includes a small "other" category.
Source: McKinsey Global Teacher and Student Survey

McKinsey & Company

Experiences Advising Students

High School Student

Sue is a 16-year-old sophomore at Oswego East High School. She excels in science and mathematics. She is starting to think more about a career, specifically "Genetic Counseling"

3. Build & Display Evidence

2. Plan to be Relevant

1. Aware of Forces and Trends
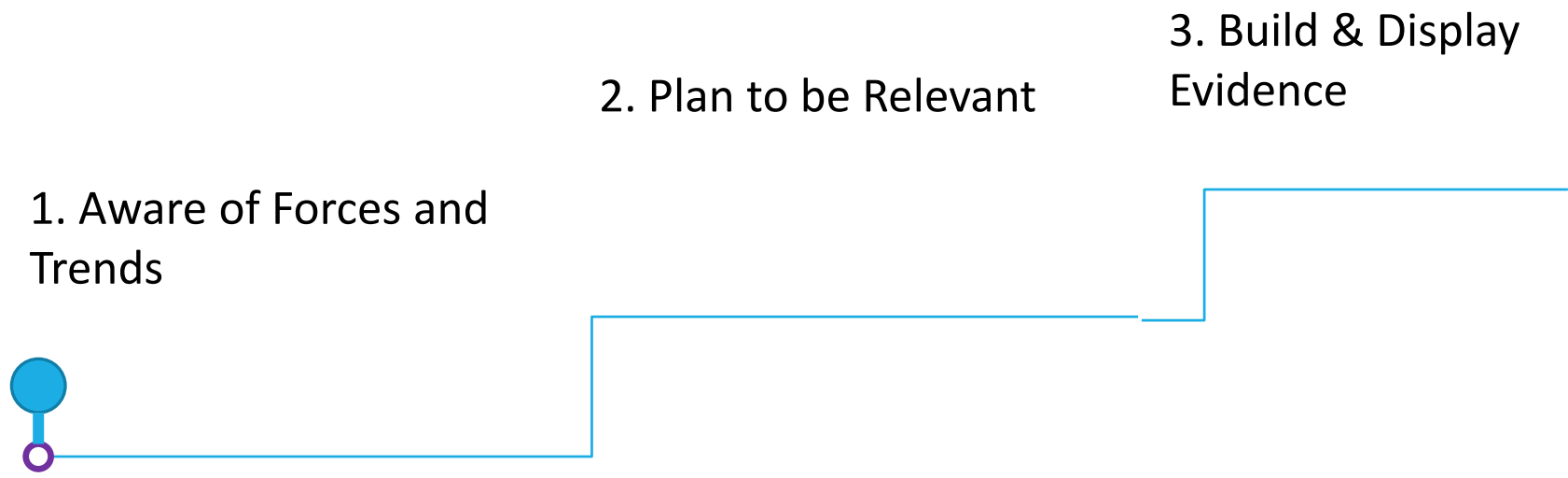
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- What is the role of schools? Out of school entities?

- What are kids responsible for on their own?

- What digital resources are vital for success?

- What is the future of K-12? What about Post secondary?

- Certification pathways?

What is your perspective?

- What is working/not working in preparation of students?

- Where are you seeing gaps?

- What experiences do students need to develop the skills needed?

- What in-school experiences seem to work?

- What out of school experiences seem promising?

- Are businesses interested in identifying talent before college graduation? If so, how?

- Are you aware of promising solutions?

- Is it a matter of scaling up working solutions? Disrupting the preparation pipeline? Both?

Learner choose at least 2 of the following list:

- A Role (programmer)

- Industry (Manufacturing)

- Technology (robotics) or Concept (gig economy)

BROADSKILLING

Accenture: The Future of Education blog series:

- [Realising the Value of Learning](#)

- [Truly Human Learning](#)

- [New Models of Work and Learning](#)

Instructional Design: Mode of delivery is based on complexity and change

Content Complexity

High

- Whitepaper
- Conference
- Role Based Simulation
- Mentor
- Certification
- ?

- Expert Network
- Focused Workshops
- On-the-Job Feedback
- AI Augmentation
- ?

- Course/Classroom
- Online Course
- Podcasts
- Books/Audio Books
- ?

- Social Media
- Podcasts (follow)
- Website
- Newsfeeds
- Collegial Network
- ?

Low → High

Pace of Content Change