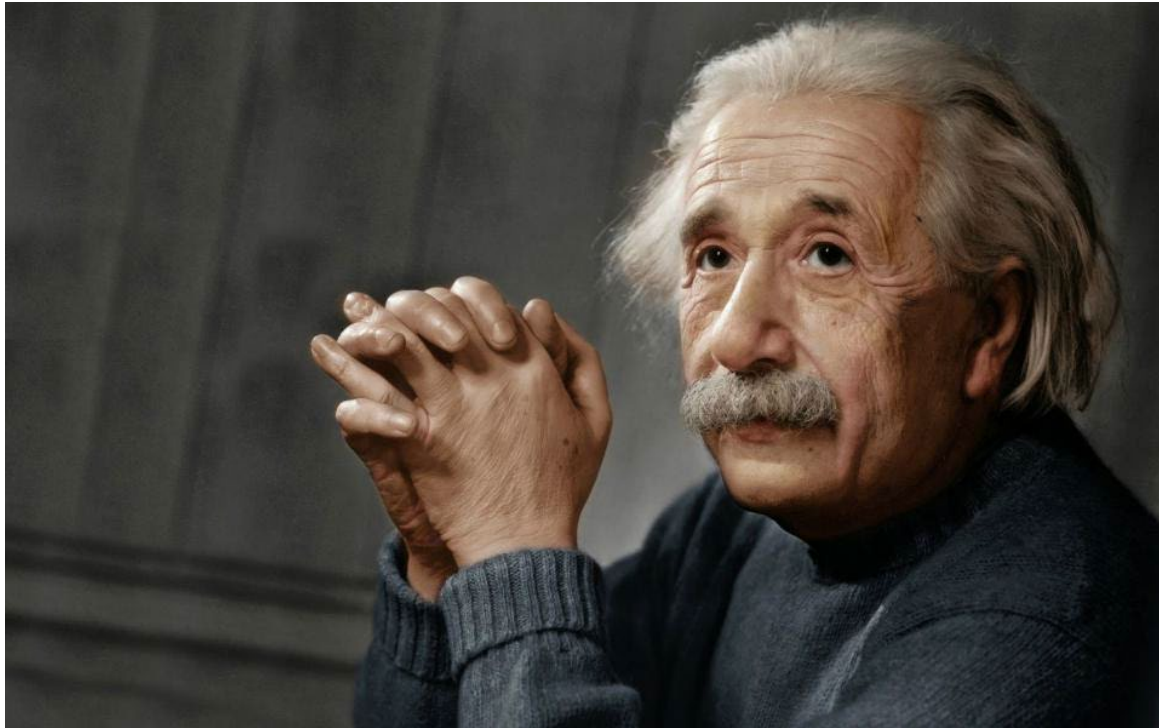


Staying Relevant in the Age of Robots and Artificial Intelligence

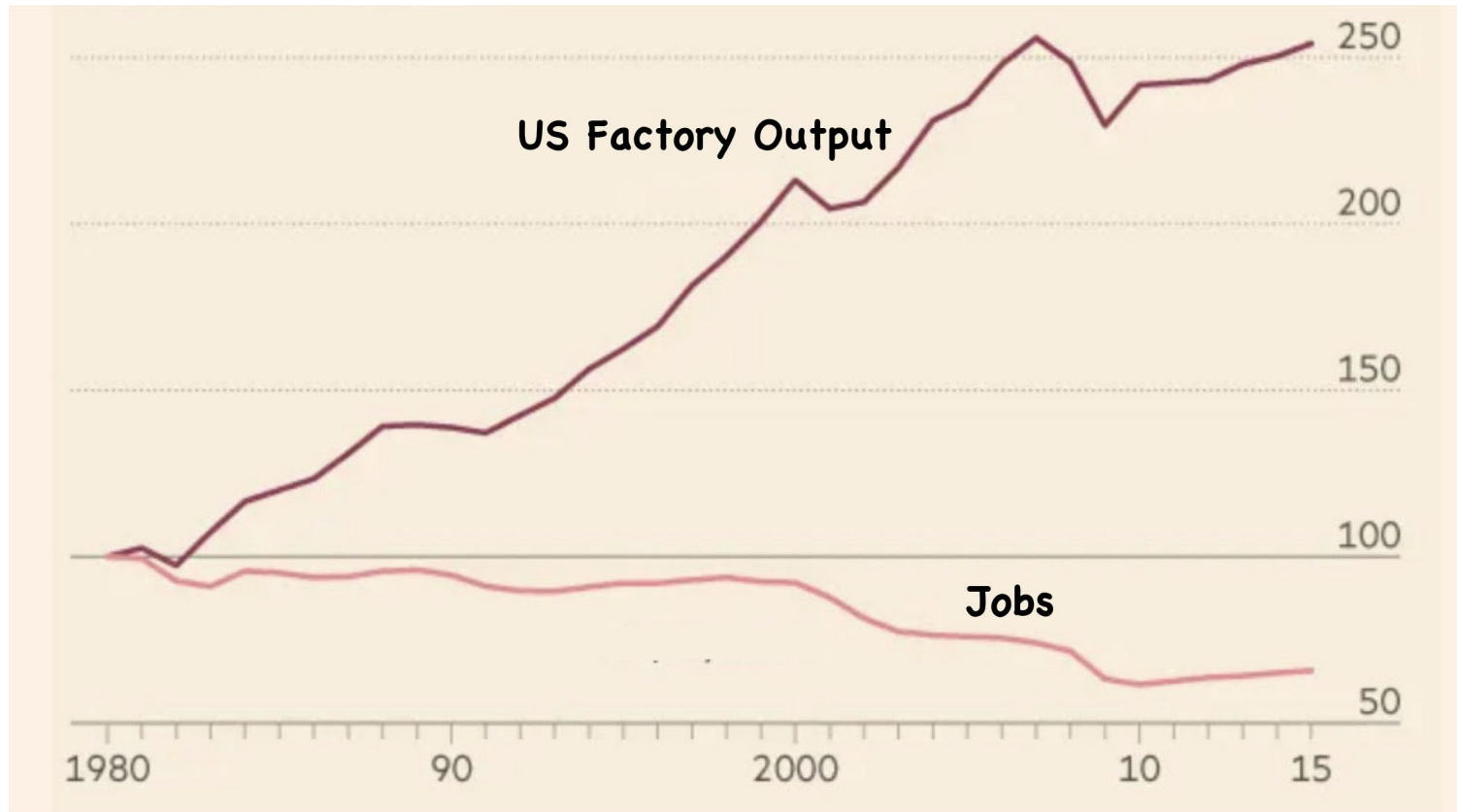


“Education is not the learning of facts,
but training of the mind to think”

- Albert Einstein

Loss of Manufacturing Jobs

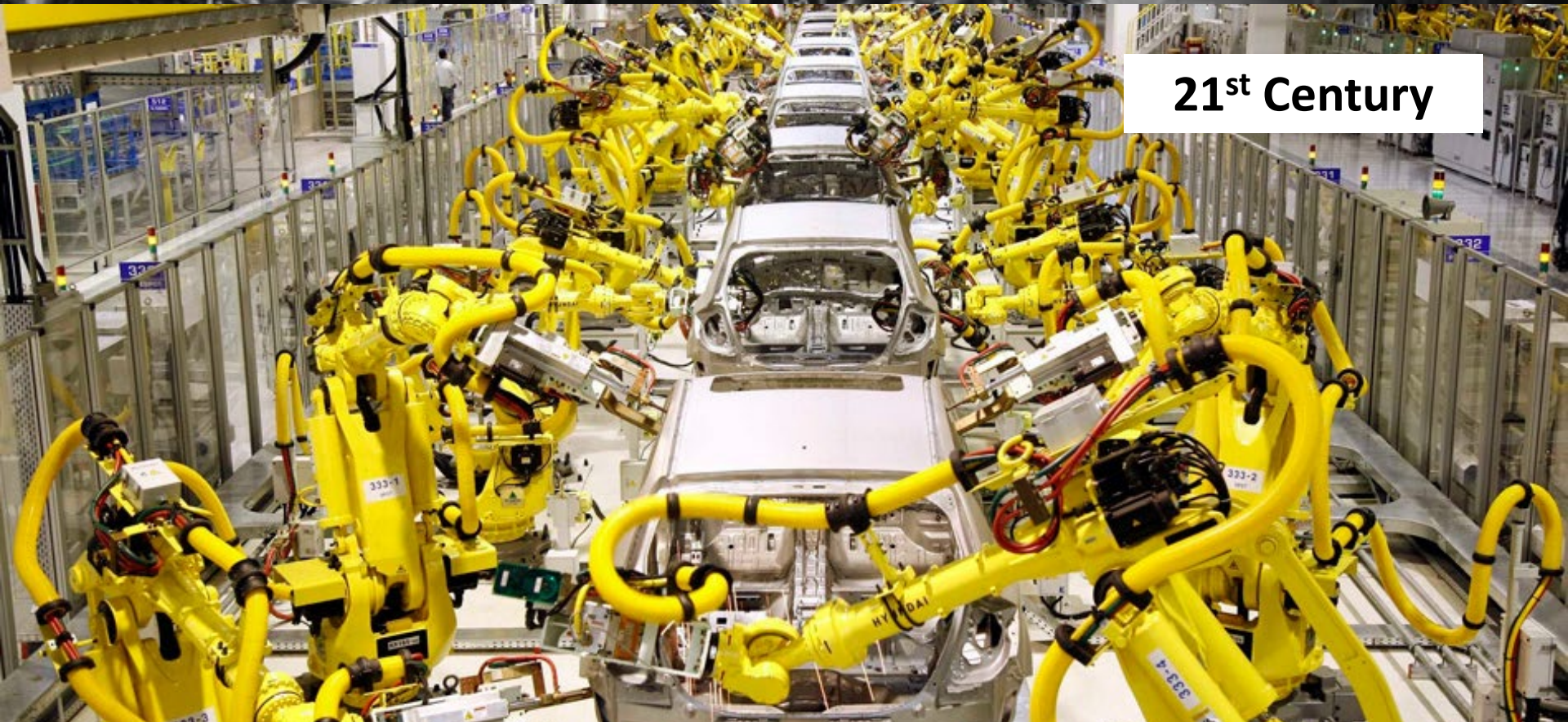
True in many other blue-collar sectors



Approx. 85% of jobs were lost to automation, not outsourced to low wage countries.



Early 20th Century



21st Century

More Blue Collar Jobs Threatened by Technology

3D printing with metal, concrete or plastics

Warehousing, inventory, shipping

Food servers, cooks and busboys

Phone receptionists

Customer service

Commercial drivers

Sales

Typists

Travel agents

More . . .



White Collar Jobs Lost to Artificial Intelligence

Criminal Justice System: Policing, Bail, Sentencing, Parole

Human Resources: Screening, Interviews, Hiring, Promotions

Higher Ed: Admissions, Financial Aid, Teaching, Grading

Military: Autonomous Weapons, Threat Monitoring

ChatGPT: Many!

Medical Diagnosis

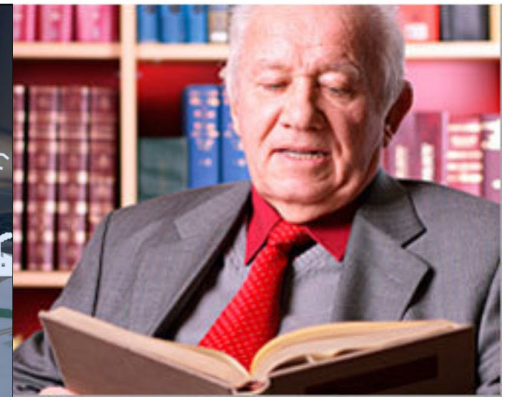
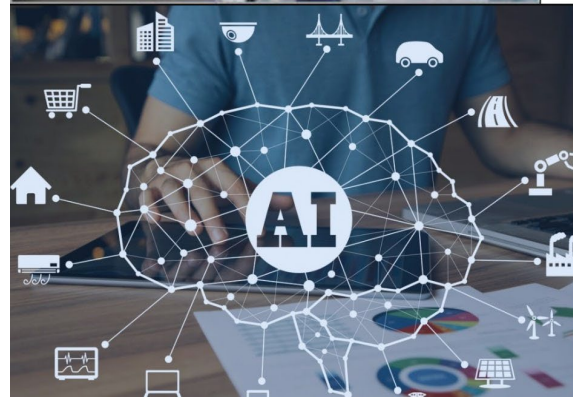
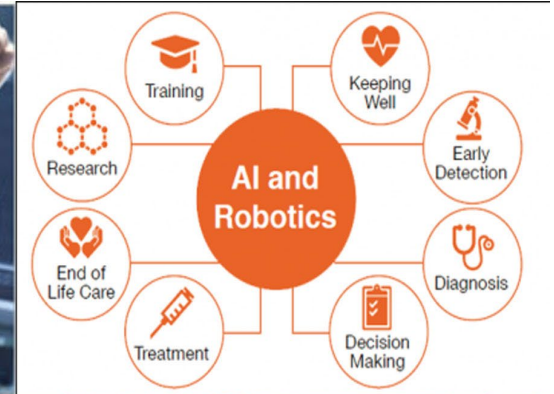
Legal Discovery

Financial Advisors

News Reporters

Airline Pilots

More



Large Language Models Can't be Trusted

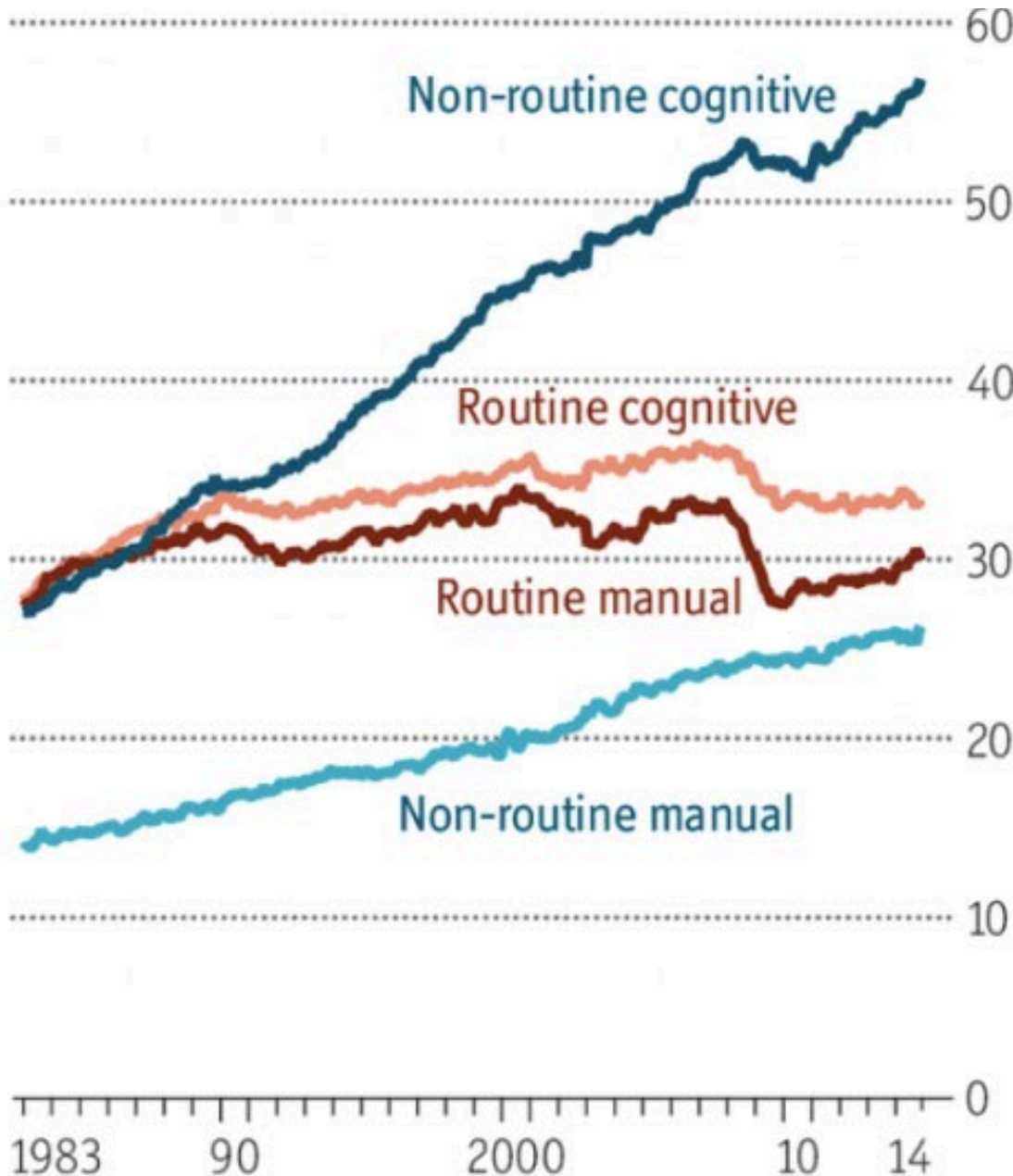
[Large Language Models, like ChatGPT] greatest shortcoming is their unreliability, their stubborn tendency to confidently provide inaccurate information.

- Forbes, November 7, 2023

The new AI. Systems [like ChatGPT] are “built to be persuasive, not truthful,” an internal Microsoft document said. “This means that outputs can look very realistic but include statements that aren't true.”

- New York Times, May 1, 2023

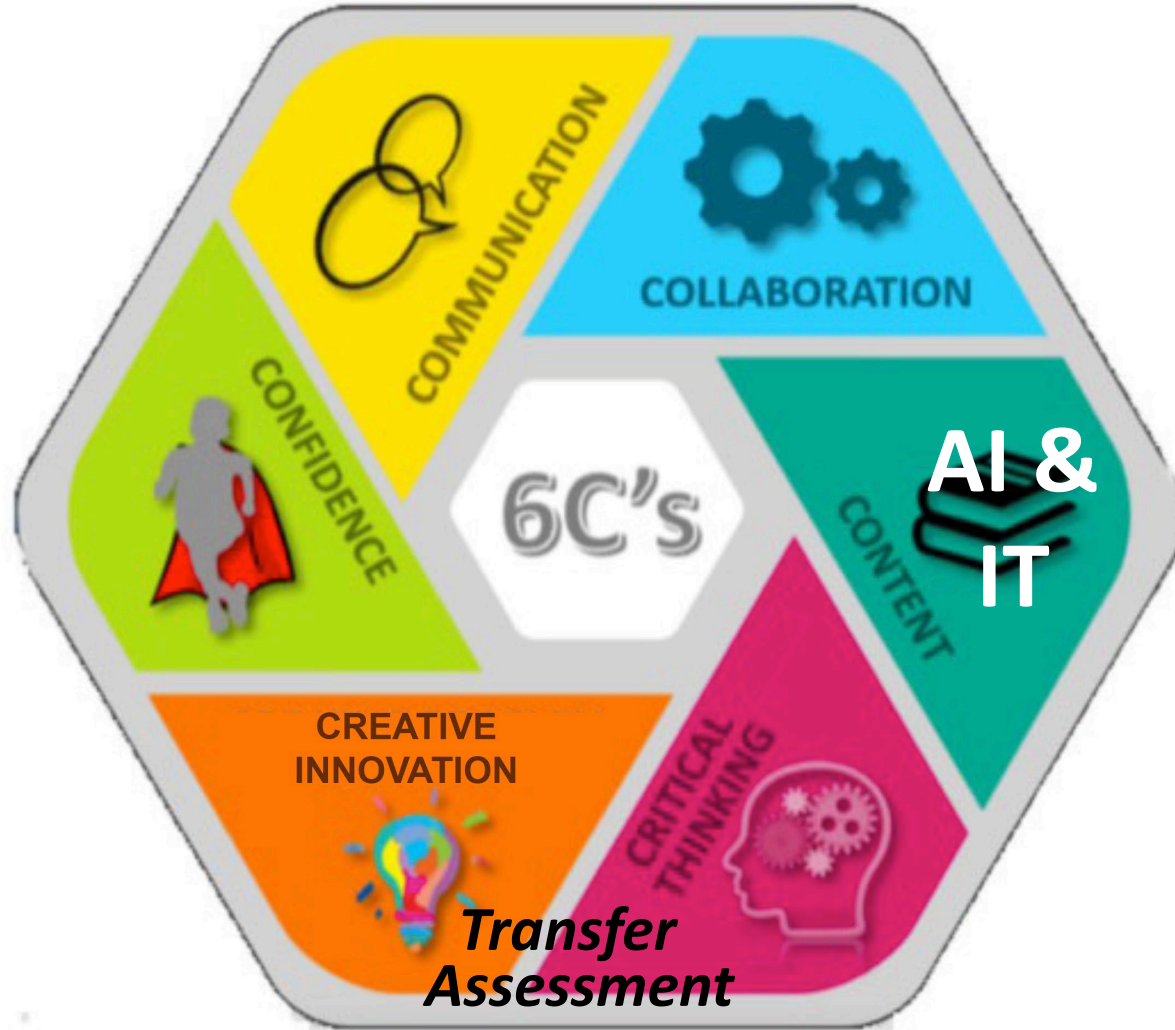
Technology is Disrupting the Workplace



Routine cognitive tasks can be done by artificial intelligence.

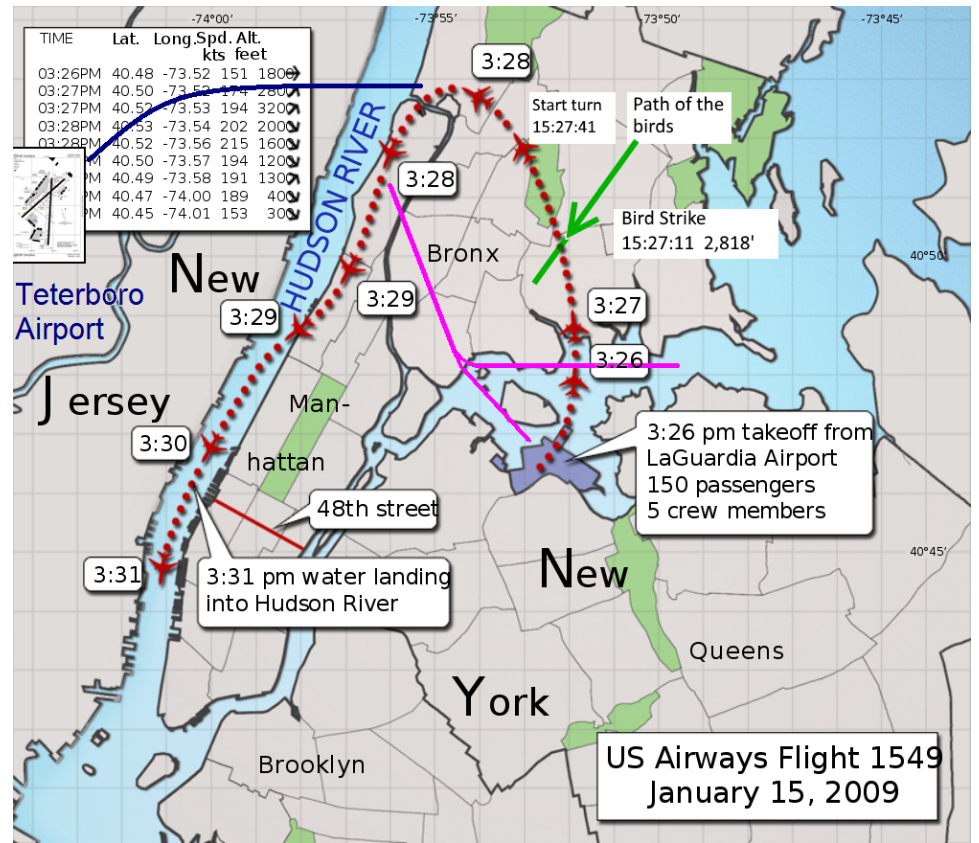
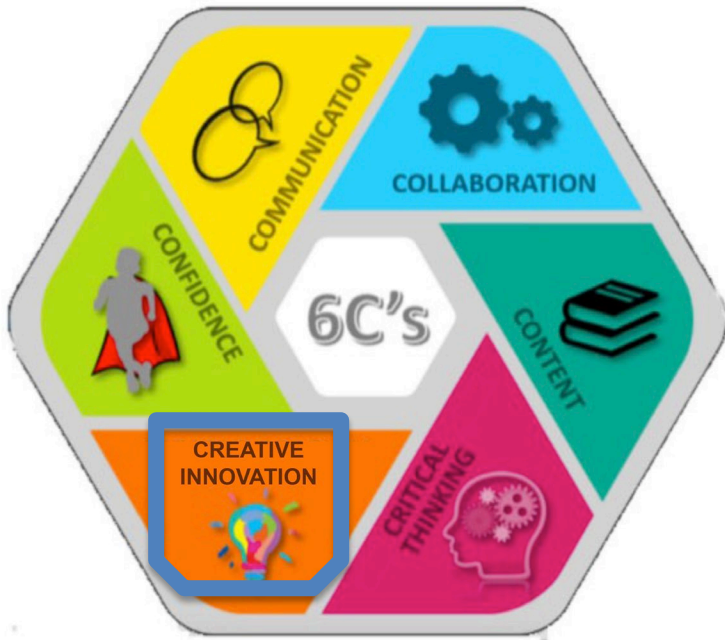
Routine manual tasks can be done by robots.

21st Century Skills Are Tech-Proof



Risk-taking
Open Mind
Ambiguity
Disruption

Mastery, Transfer & Disposition Requires Many Years of
Deliberate Practice in Multiple Subjects



42 Years of Deliberate Practice



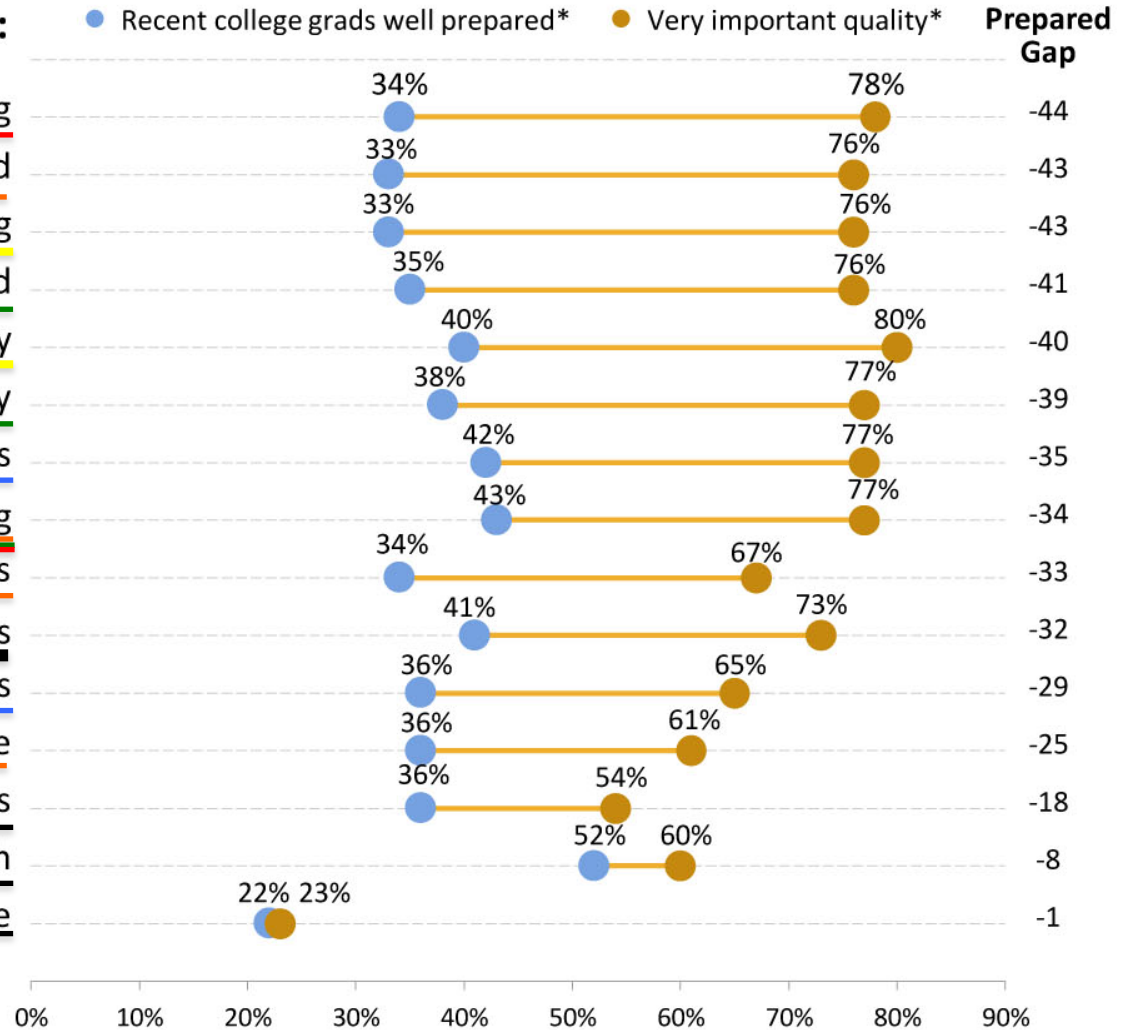
Geese → River = 208 Seconds



Today's Employers Find New Hires Fall Short in Most Human-Specific Skills

Among business execs:

- Critical thinking/analytical reasoning
- Apply knowledge/skills to real world
- Communicate effectively in writing
- Self-motivated
- Communicate effectively orally
- Able to work independently
- Able to work effectively in teams
- Ethical judgment/decision-making
- Able to analyze/solve complex problems
- Find, organize, evaluate info: multiple sources
- Solve problems w/people of diff. backgrounds
- Able to innovate/be creative
- Able to work with numbers/stats
- Stay current on changing tech
- Proficiency in foreign language

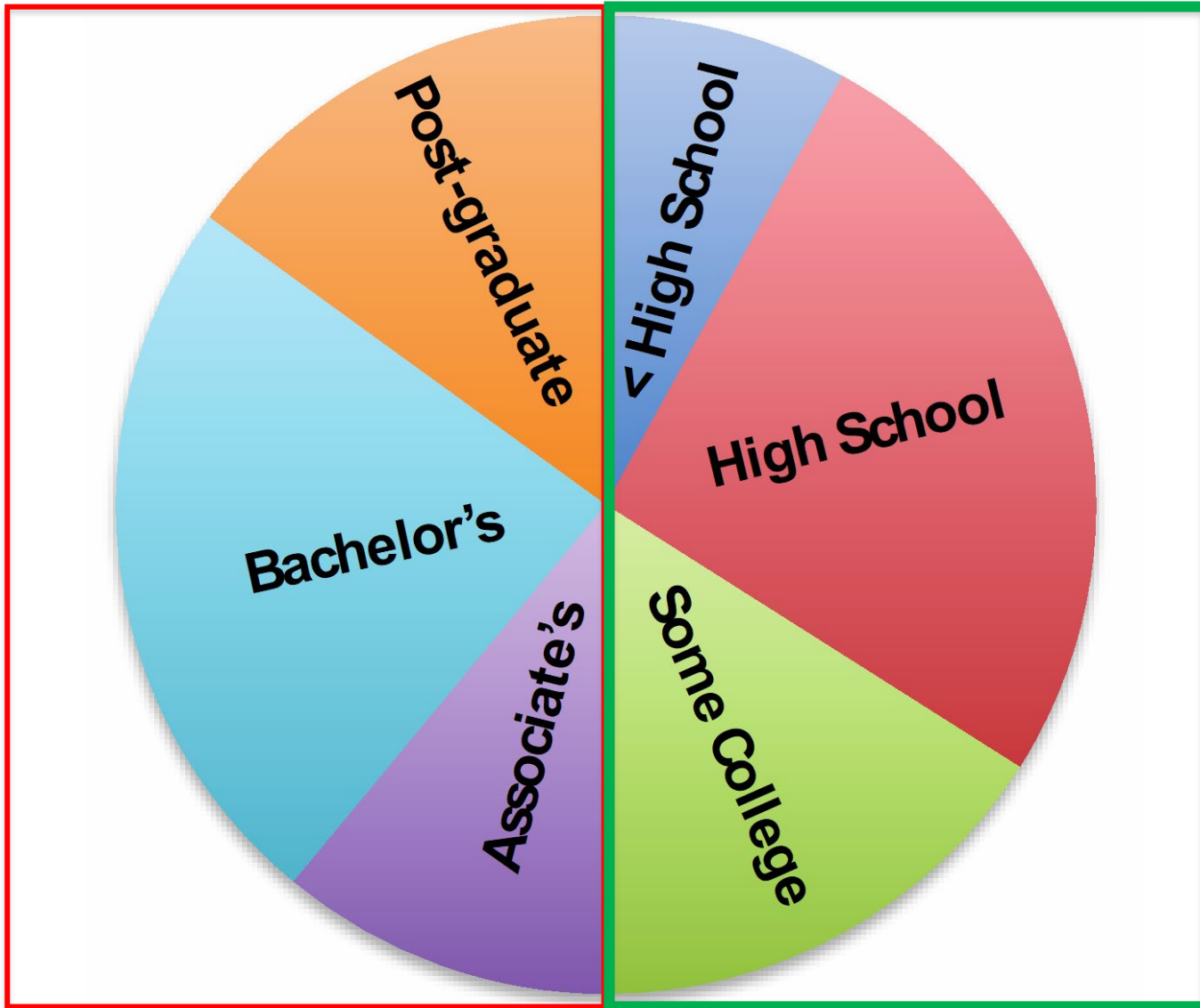


Hart Research for
Association of American Colleges and Universities.

* 8-10 ratings on a 0-to-10 scale

Are US Students Career-Ready?

American Association of Colleges & Universities



21st Century Skills Committee

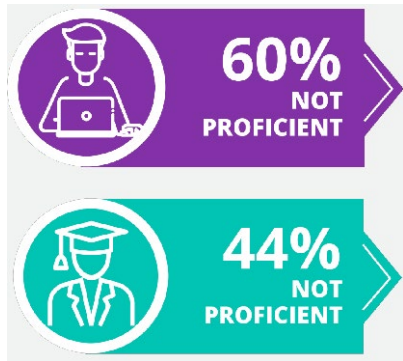
Are US High School Seniors College-Ready?

Minnesota P-20 Education Partnership

US is Mid-Pack or Below for 21st Century Skills

Higher Order Thinking is not Taught in College

Example: Critical thinking



College Freshmen

College Graduates

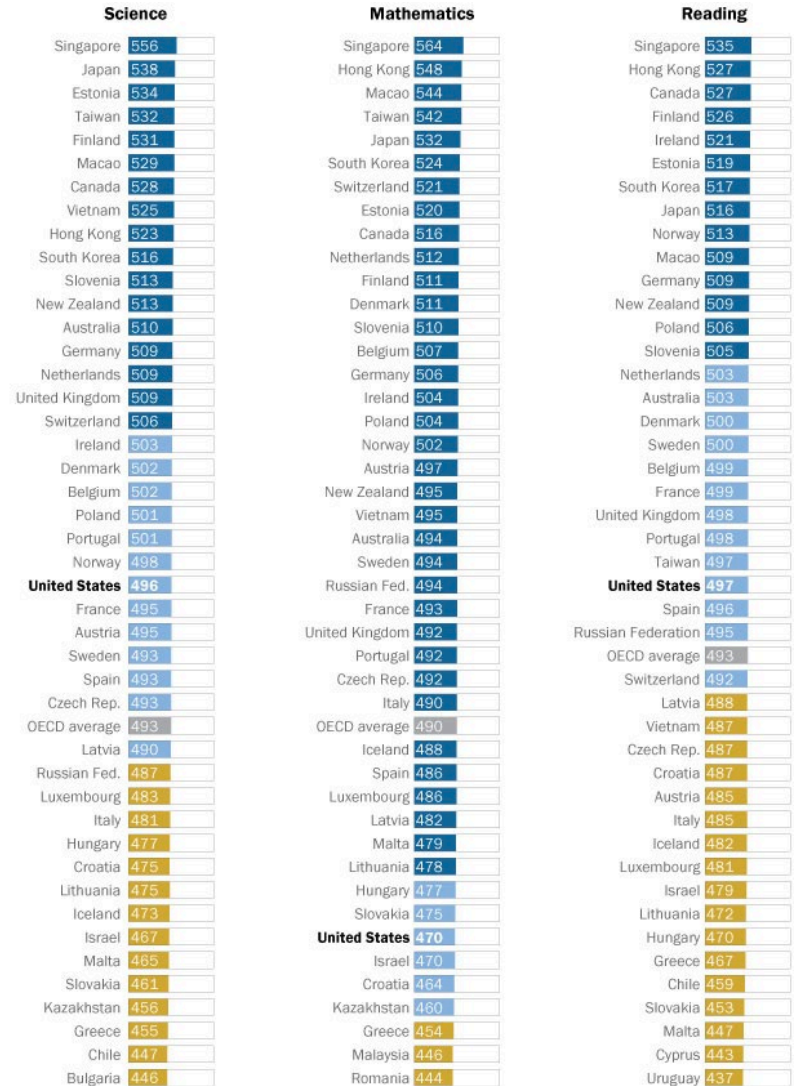
Over 70 studies with a total of 20,000 participants.

Creative Problem Solving

American adults (age 16-65) tied for last among developed countries in problem solving in technology-rich environments.

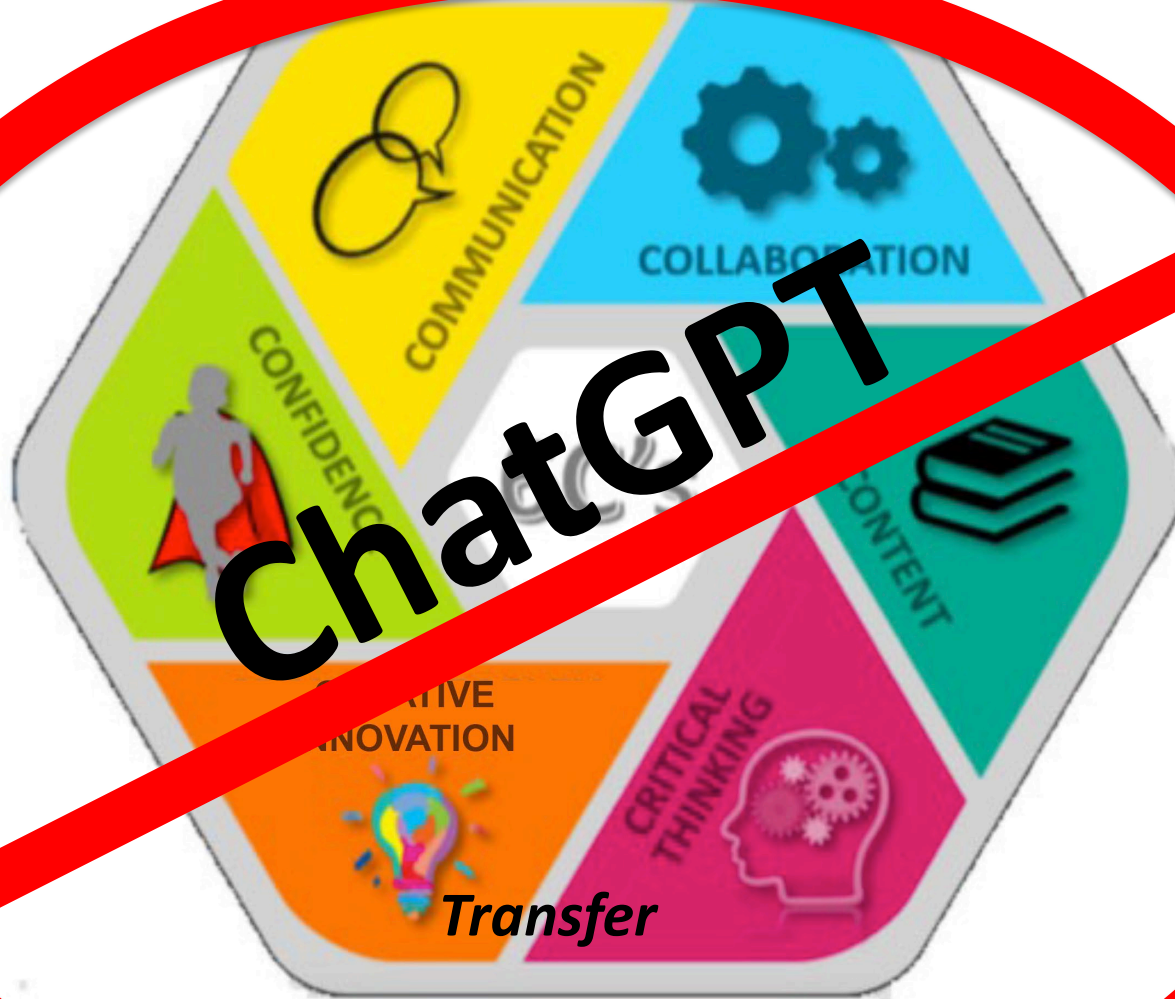
2013 Survey of Adults Skills, PISA

K-12 Education - PISA



~~Writing Promotes 21st Century Skills~~

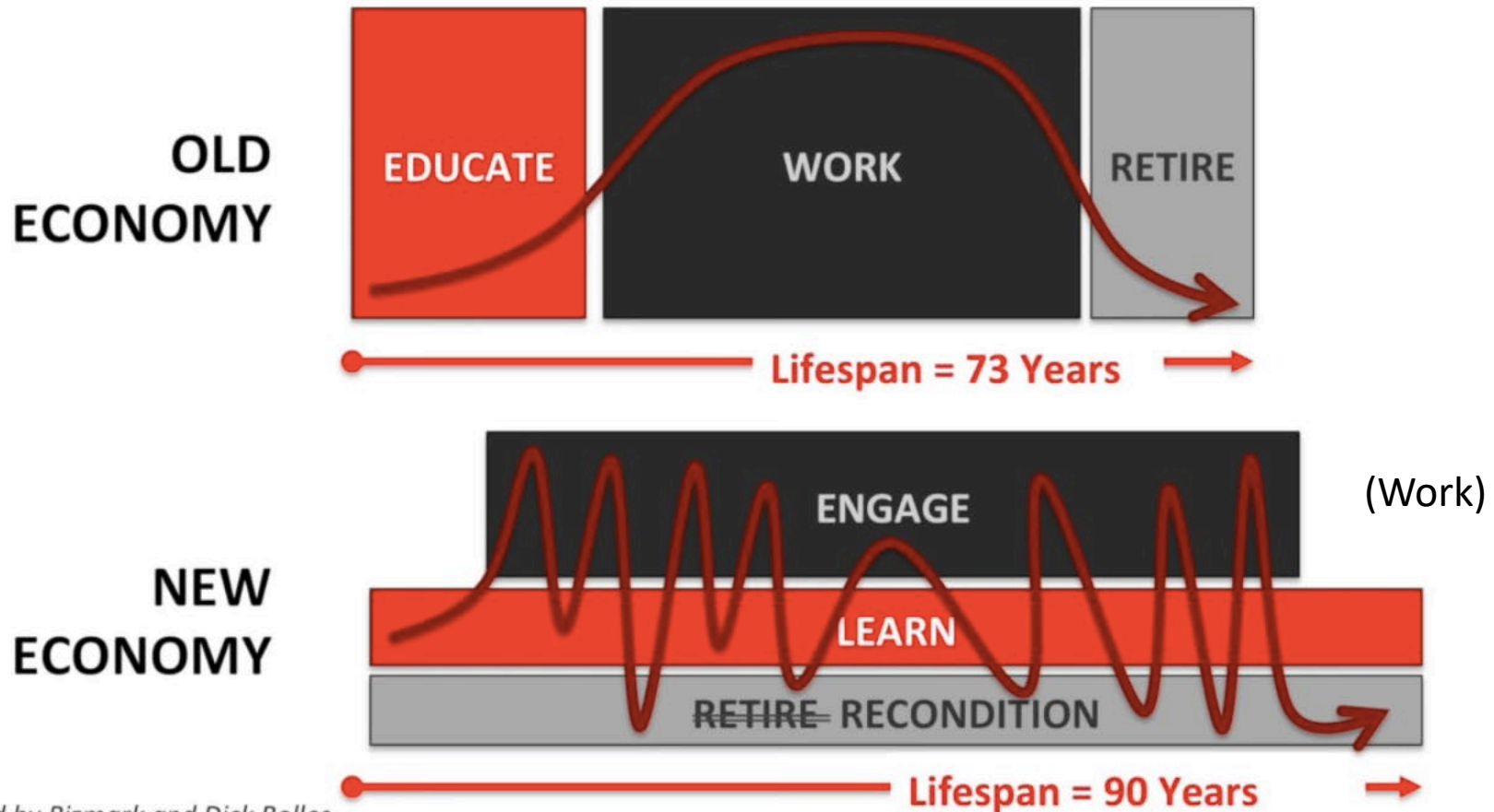
Risk-taking
Open Mind
Ambiguity
Disruption



Mastery, Transfer & Disposition Requires Many Years of
Deliberate Practice in Multiple Subjects

Lifelong Learning is a Survival Skill

THINK DIFFERENTLY: New Economy Shifts Life Blocks

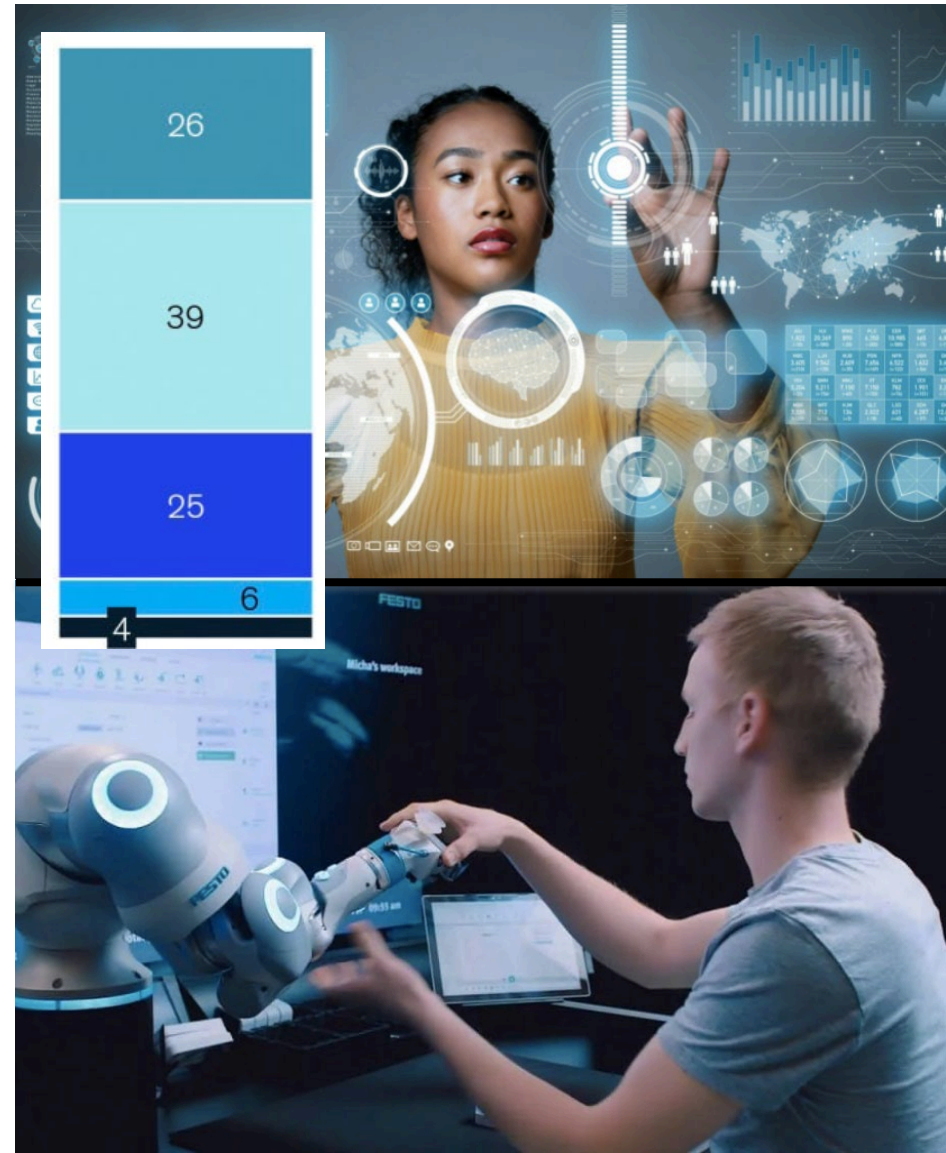
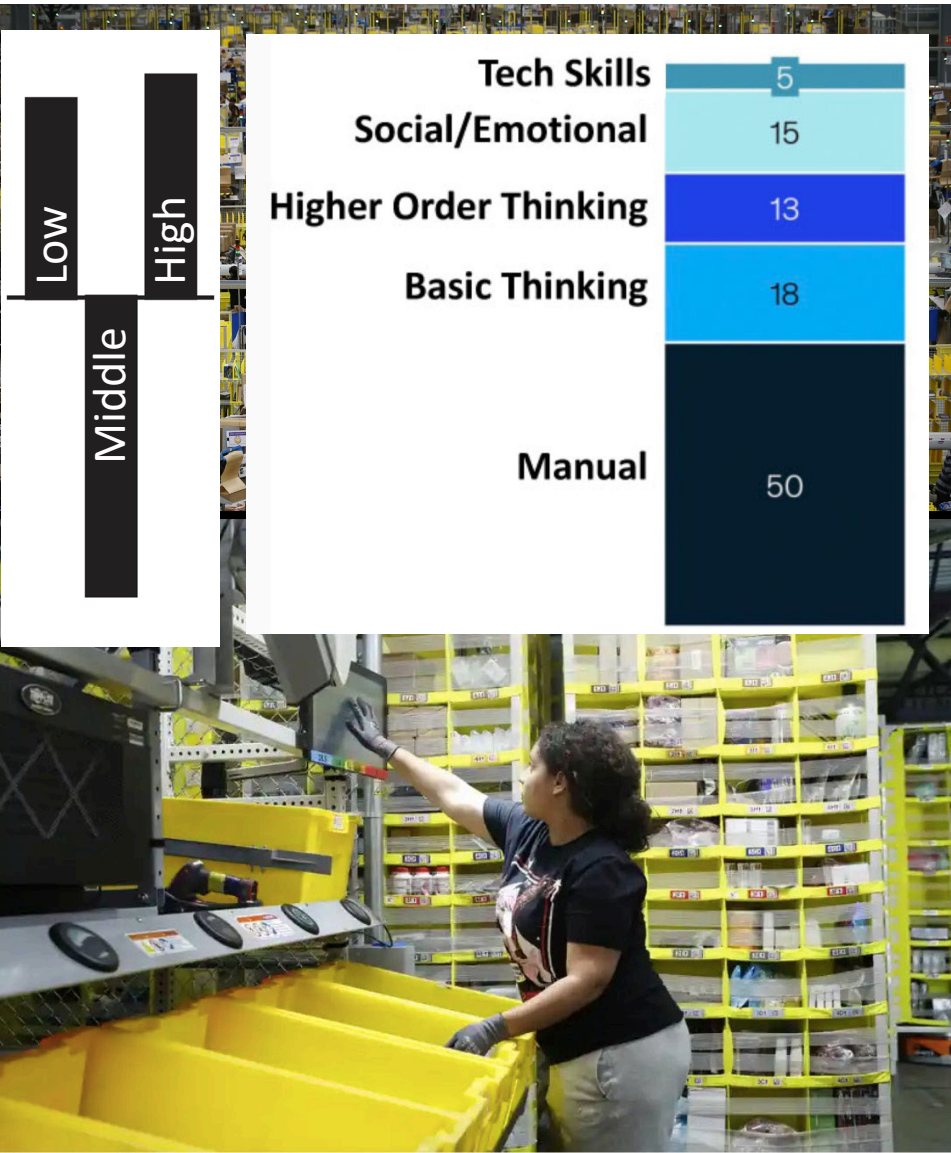


Inspired by Bizmark and Dick Bolles

Teach Study Strategies in Secondary School!

New Jobs Are Being Created

Low skill versus High skill



21st Century Skills Committee

Subject Matter Experts / Postsecondary Educators

David LaPorte, Professor
Biochemistry, CBS, U of MN
Critical Thinking

Michael C Rodriguez, Dean
U of MN College of Education
Educational Assessments

Chia–Yi Chung, Assoc Professor
U of MN College of Education
Educational Assessments

Dale Blyth, Professor Emeritus
Extension Center for Youth Development, U of MN
Social/Emotional Learning

Steve Kelley, Senior Fellow
Hubert Humphrey School of Public Affairs, U of MN
Former Minnesota State Representative and Senator

Brad Hokanson, Professor
College of Design, U of MN
Creativity and Critical Thinking

Lucy Payne, Associate Professor
University of St. Thomas, School of Education
Professional Learning Communities

Megan Rozowski, Director of Research and Policy
Minnesota Private Colleges Council

Kim Gibbons, Director
UMN Center for Applied Research and Educational
Improvement

Practicing Educators & Administrators

Noel Schmidt, Ph.D., Superintendent
Virginia Public Schools
Iron Range

Jason Berg, Superintendent
Farmington School District

Patrick Walsh, Ph.D., Superintendent
BBE Public Schools

Joel VerDuin, Chief Technology and Information Officer
Anoka-Hennepin School District

Amy Winter, Principal, former teacher
Richfield STEM Elementary
Magnet school without a neighborhood base

Seth Thompson, Hub Director
InSciEd Out, College of Biological Sciences, U of MN

Rainer Haarhusch, Dean
Career & Technical Education
Saint Paul College, Minnesota State

Jennifer Kunze, Director
U of MN Ramp up for Readiness

Bob Driver, Director
Minnesota Association of Secondary School Principles

Zeke Jackson, Sophomore
U of M, educational advocate

21st Century Skills Networked Learning Community

Alexandria Public Schools

Rick Sansted, Superintendent

Anoka-Hennepin School District

Joel VerDuin, CTI

Belgrade-Brooten-Elrosa (BBE) Public

Patrick Walsh, Superintendent

Laura Spanier, HS Principal

Becker Public School District

Jeremy Schmidt, Superintendent

Farmington School District

Jason Berg, Superintendent

Hutchinson Public Schools

Michael Scott, Dir T&L

Mahtomedi Public Schools

Barb Duffrin, Superintendent

Montevideo School District

Wade McKittrick, Superintendent

North Branch Public Schools

Sara Paul, Superintendent

Northern Cass School District

Cory Steiner, Superintendent

Richfield Public Schools

Steven Unowsky, Superintendent

Rock Ridge Public Schools (Iron Range)

Noel Schmidt, Superintendent

SW West Central Cooperative

Janelle Field, Teaching Coach

St. Anthony New Brighton Public Schools

Renee Corneille, Superintendent

St. Cloud Public Schools

Leah Sams, Dir CTE Pathways & CCR

Springfield Public Schools

Keith Kottke, Superintendent

21st Century Skills

Career and Technical Education Subcommittee

Annette Parker, President

South Central College, Mankato

Pres. Obama's Advanced Manufacturing Partnership (AMP) Steering Committee

Co-chair AMP's "Demand-Driven Workforce Development" work team

Massachusetts Institute of Technology Task Force on Work of the Future

Larry Lundblad, President Emeritus

Minnesota State College Southeast

Minnesota State Workforce Development Board

Robb Lowe, Director

CTE Pathways at Minnesota State

Rainer Haarbush, Director

Career Technical Initiative, State of Massachusetts

Former Dean CTE, Saint Paul College (Minnesota State)

Josiah S. Litant, Executive Director

Minnesota P-20 Education Partnership

Former VP Strategic Initiatives, Minnesota State College Southeast