DIGITAL TUTORS

WASHINGTON D.C. 26, 2017

THE NATIONAL ACADEMIES OF

IMPORTANT NOTE

The views expressed in this presentation and its associated discussion are those of the speaker and do not constitute an official position of the Massachusetts Institute of Technology.

ABOUT ME

ENRIQUE SHADAH

Head, MIT Workplace Learning Collaborative

15+ Years Venture Creation

10+ Years Advisory

5+ Years Academia-Industry Collaborations

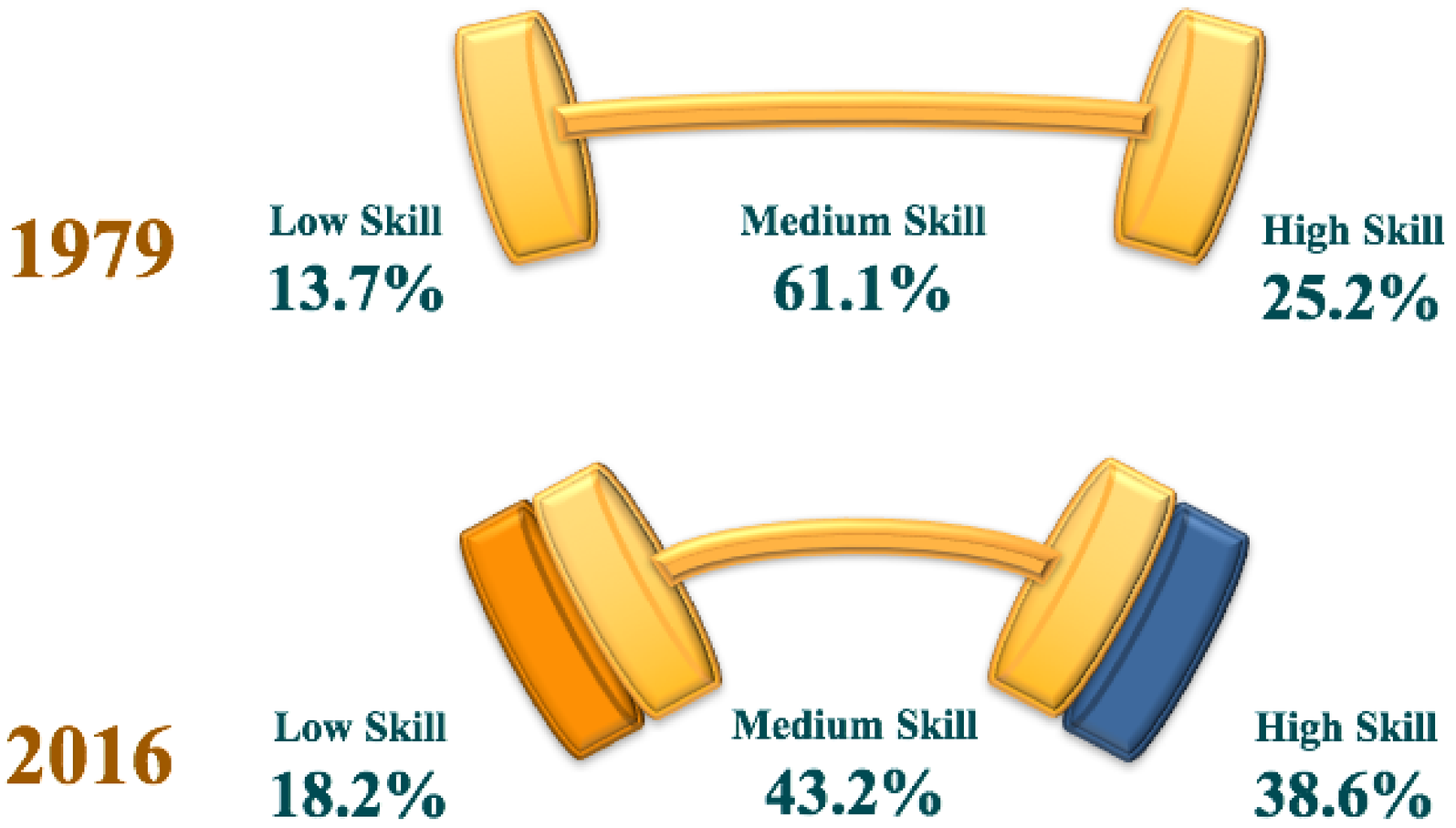
ROLE OF ACADEMIC INSTITUTIONS

- The characteristics of the future digital ecosystem
- The role universities are playing in shaping the future digital ecosystem
- The sets of skills required for the future
- New academic programs and changes in the curriculum to better prepare 21st century students

LOOK AT THE SYSTEM

- Employment and employment readiness
- Learning and training and practice
- Science-informed pedagogy

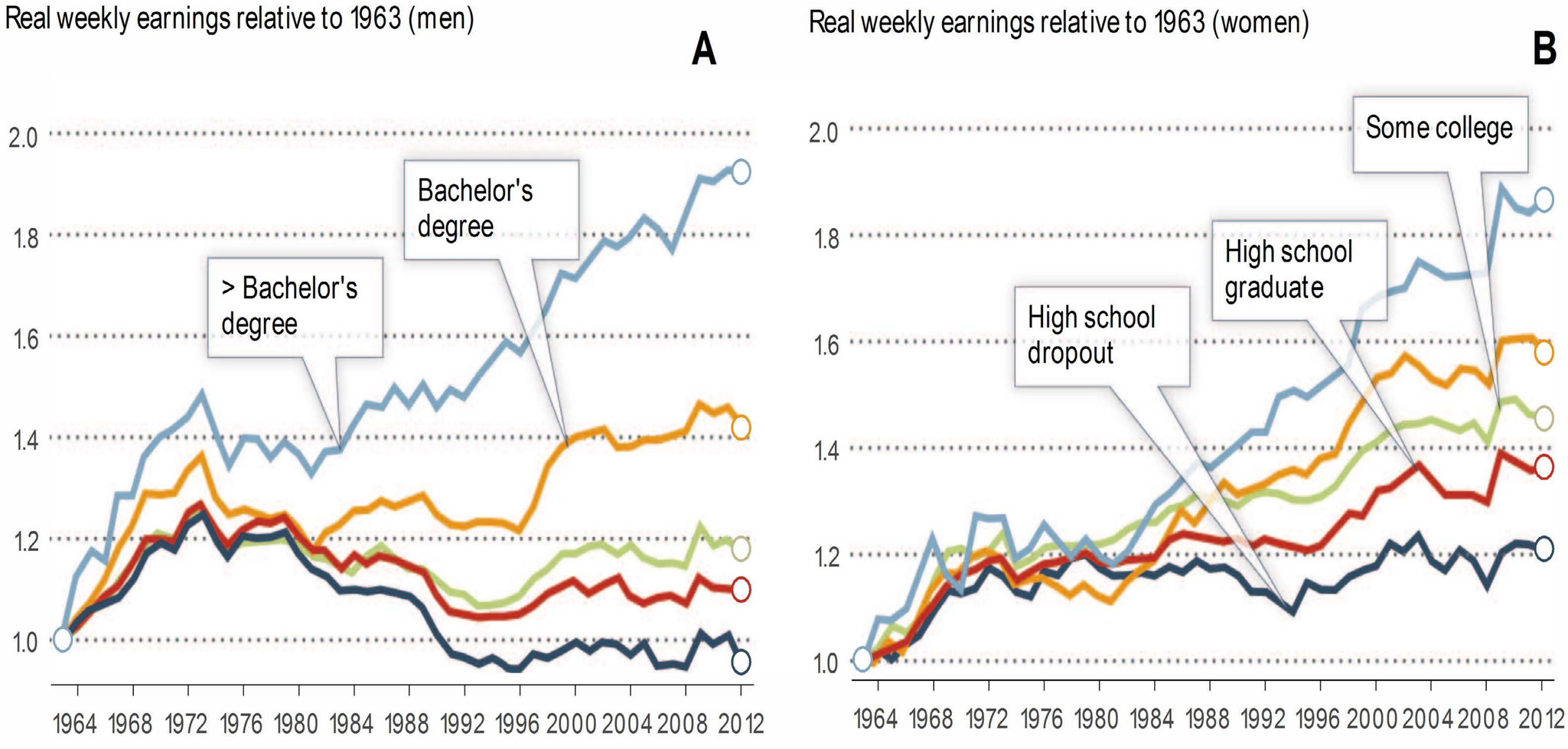
JOB POLARIZATION



Tüzemen and Willis 2013
Autor and Dorn 2013

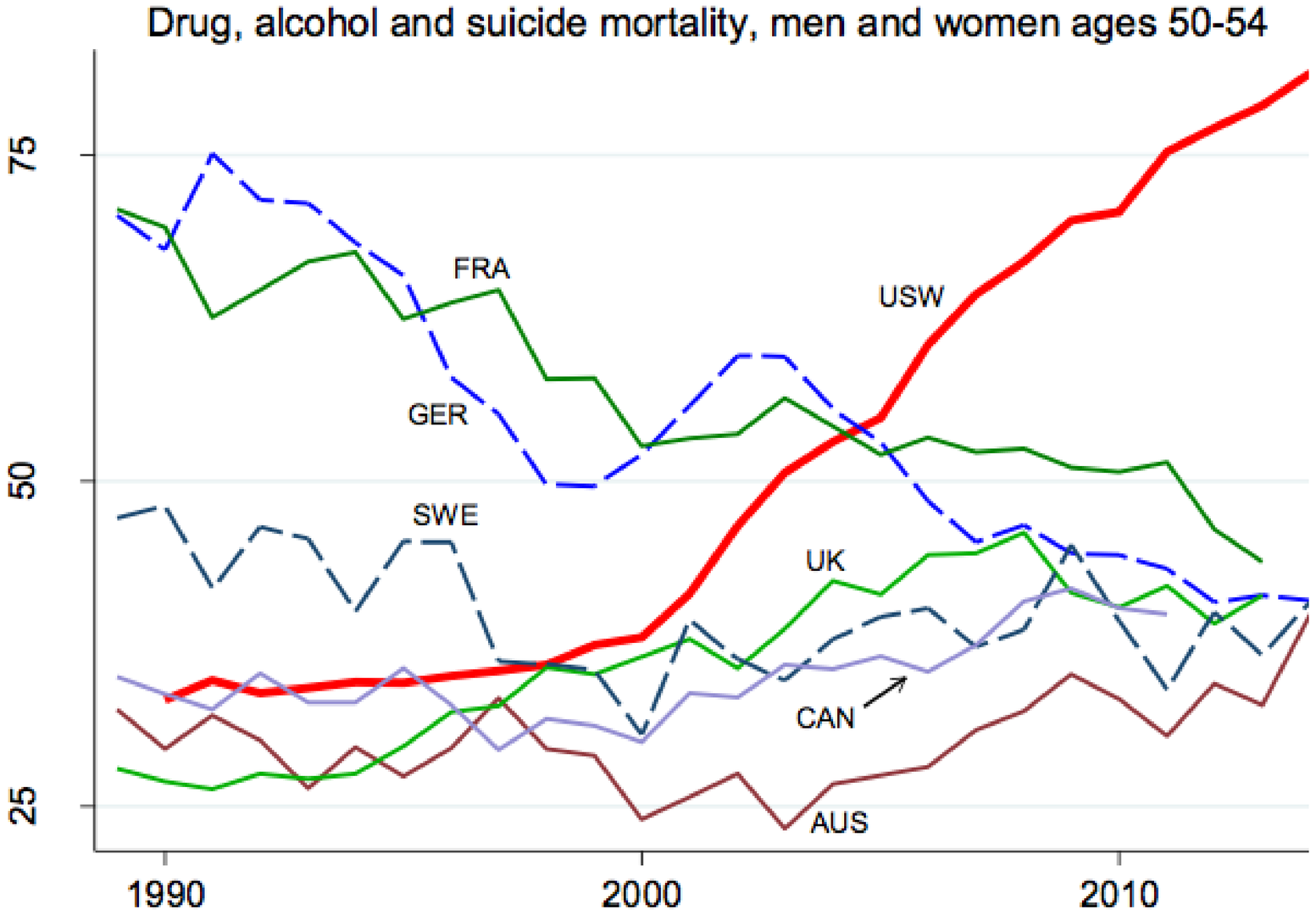
MUST DEAL WITH CONSEQUENCES

Diverging: Earnings of College Grads Rose 40 – 80% in 1980 – 2012, Earnings of High School or Lower Stagnated or Fell 20%



Autor, 2014

MUST DEAL WITH CONSEQUENCES

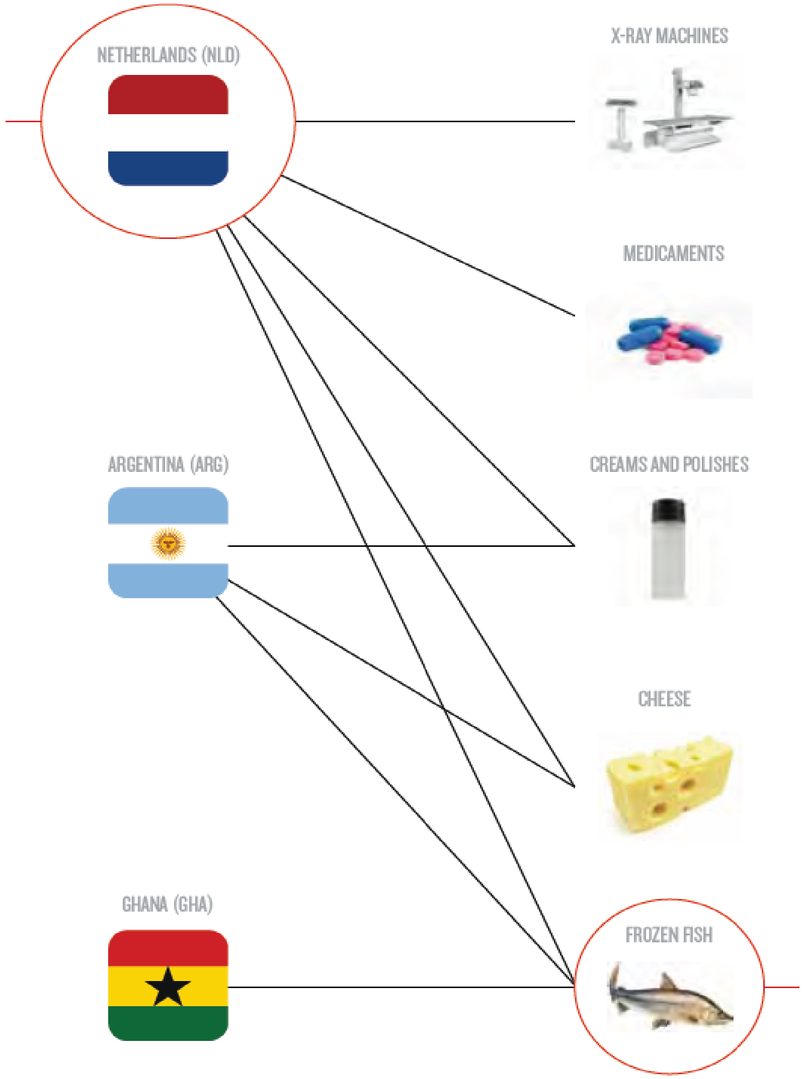


Joblessness is Not Exclusively About Income

Case and Deaton 2017

LOOK AT PRODUCT SPACE VIA INDUSTRY LOCATION NETWORKS

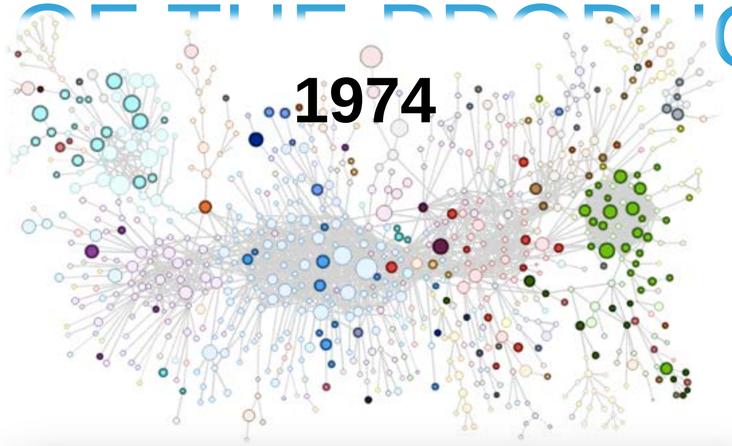
DIVERSITY ($k_{c,0}$):
Diversity is related to the number of products that a country is connected to. This is equal to the number of links that this country has in the network. In this example, using a subset of the 2009 data, the diversity of Netherlands is 5, that of Argentina is 3, and that of Gana is 1.



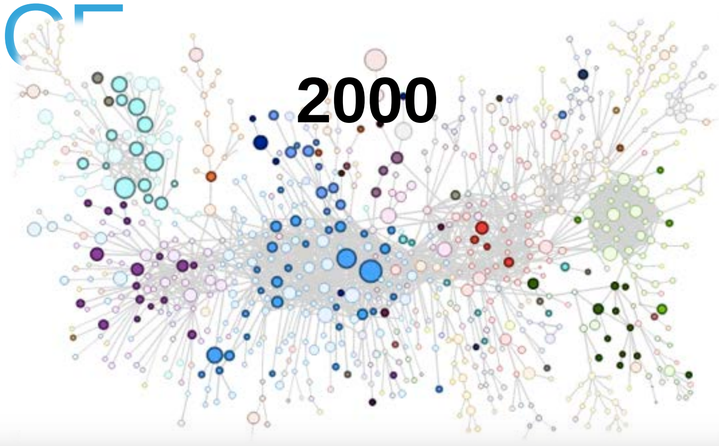
UBIQUITY ($k_{p,0}$):
Ubiquity is is related to the number of countries that a product is connected to. This is equal to the number of links that this product has in the network. In this example, using a subset of the 2009 data, the ubiquity of Cheese is 2, that of Fish is 3 and that of Medicaments is 1.

Cesar Hidalgo,
MIT Media Lab

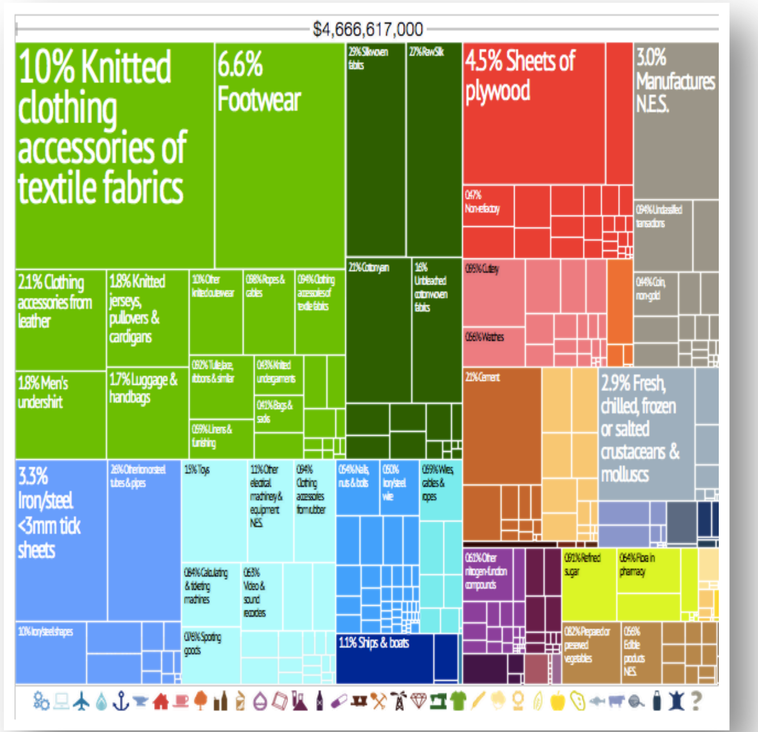
DEVELOPMENT THROUGH THE EYES OF THE PRODUCT SPACE

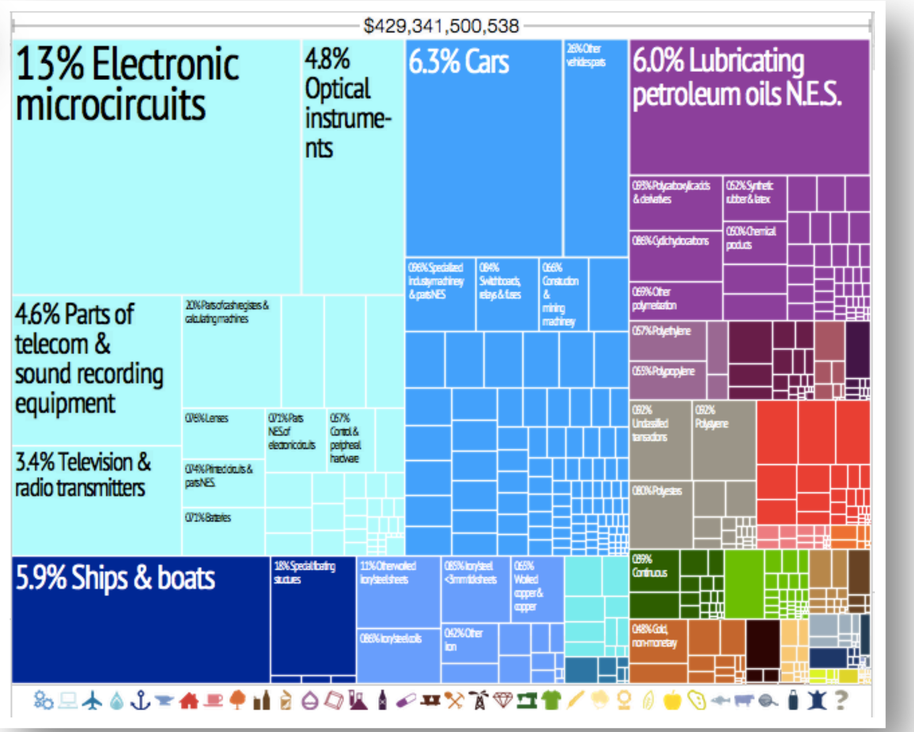


1974



2000



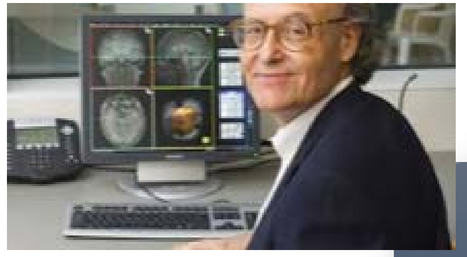


HOW TO LEARN?

…and many others…

SCIENCE CRITICAL FOR AGILE LEARNING

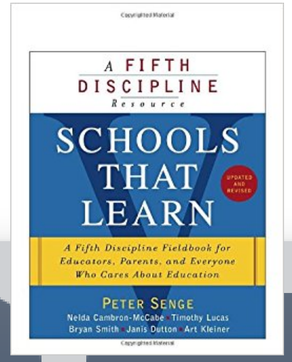
Mind Wandering



John Gabrieli, Director of MITili

Systems Thinking

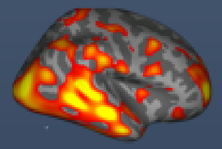
Peter Senge, MIT Sloan



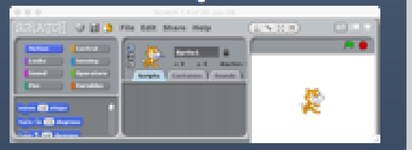
Life-long Kindergarten

Mitch Resnick, MIT Media Lab

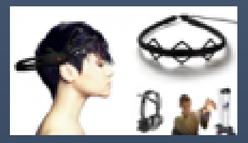
Discovery



Development



Testing



Scaling

SCRATCH

MIT EARLY CHILDHOOD COGNITION LAB
PlayLab
AT BOSTON CHILDREN'S MUSEUM

Laura Schulz, Professor MIT

Learning From Instruction And Exploration

APPLY SCIENCE TO THE LEARNING DISCIPLINE

	MITili Learning Science and Research	**J-WEL** Best Practices Transfer Learning Engineering	**Digital Learning** Learning Creation and Delivery
Workplace/ Lifelong Learning		Workplace Learning Collaborative	Digital Learning Solutions, MicroMasters, Bootcamps
Higher Education		Higher Education Collaborative	MITx, Residential MITx, OCW, MicroMasters, Bootcamps
Birth through pK-12		pK-12 Collaborative	Teaching Systems Lab

MITILI: TESTING OF METHODS TO IMPROVE RECALL IN VIDEO-BASED INSTRUCTION

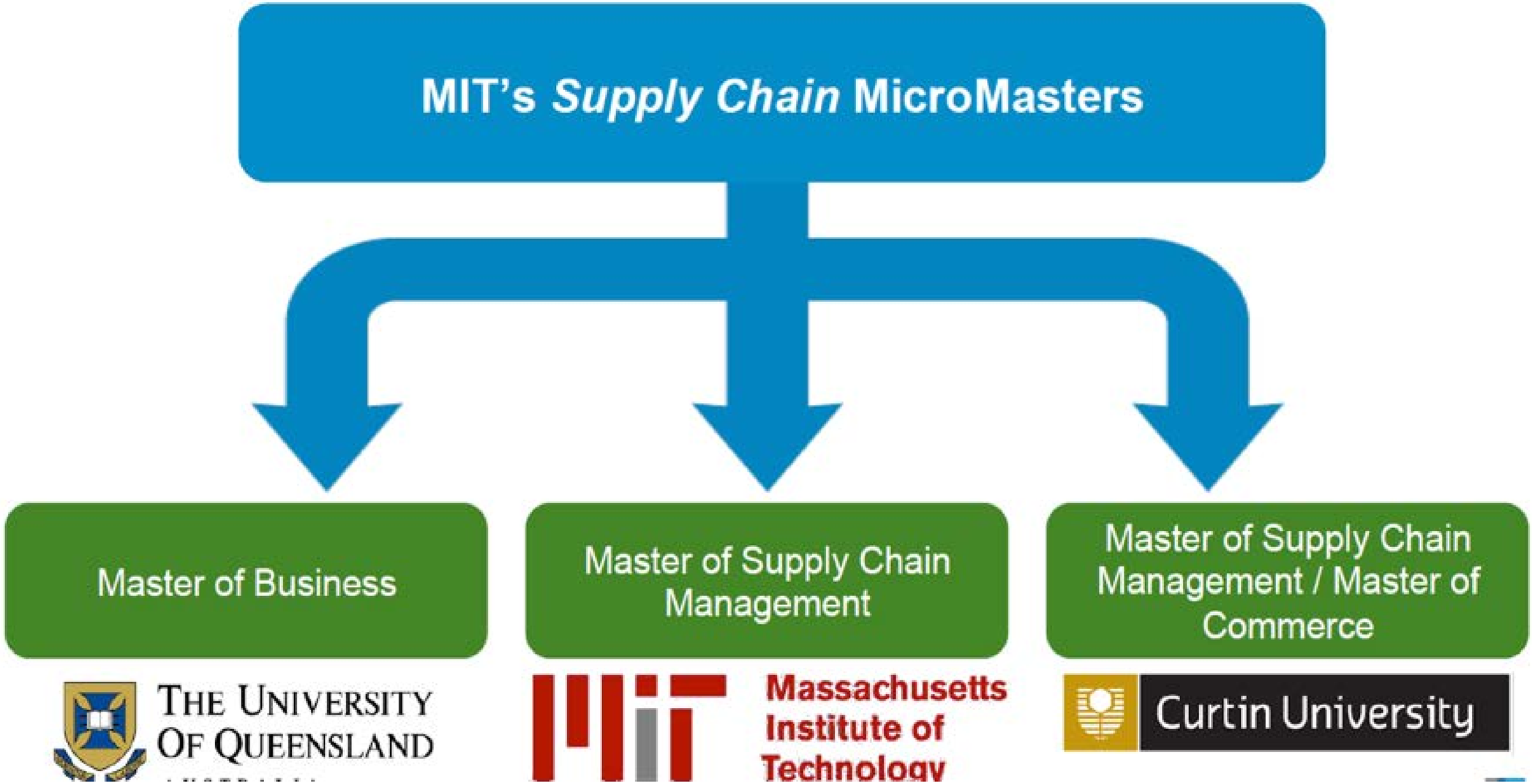
- Interpolated testing increased retention of video information by 27%
- Science of learning made videos more interesting
- Successfully detected attention and mind wandering in the brain during video training

Okano, Gabrieli, MIT, 2016

JWEL: APPLIED SCIENCE + COMMUNITY + PRACTICE

- J-WEL Weeks (Oct. 9-12, 2017)
  - Training+development
  - Outcome oriented
  - Scientist and practitioner led
- J-WEL Exchanges
  - Deep dive on specific topics
  - Focus on transformational change

DL: MICROMASTERS CREDENTIAL OPENS A NEW WORLD FOR LEARNERS




175,604 Learners Enrolled
11,554 Learners Verified
196 Countries Represented
17,445 Certificates Issued
MicroMasters
SUPPLY CHAIN MANAGEMENT

DL: NEW ONLINE LEARNING CONTENT, NEW EXPERIENCES

Video

Polls & Surveys

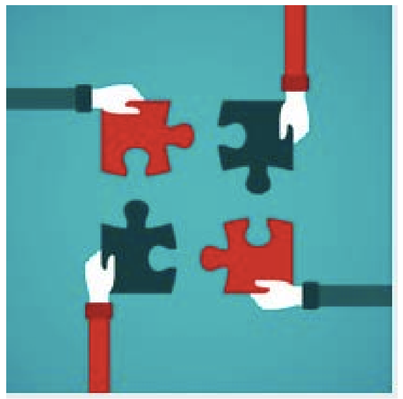
Industry Expertise

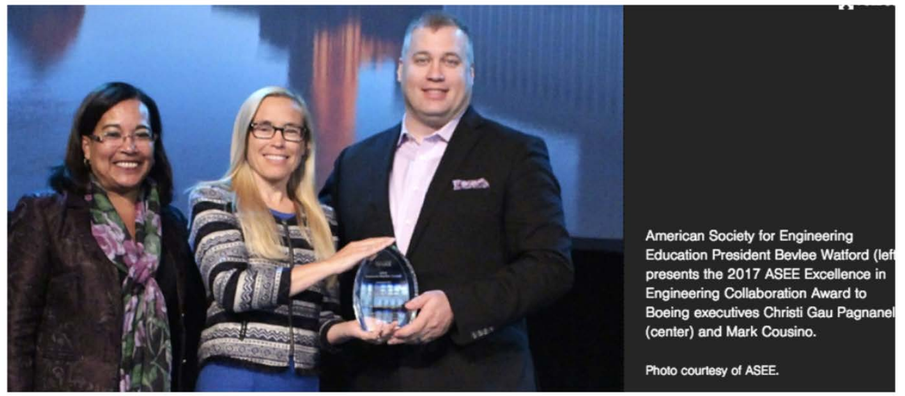
Social

Graded assessments

Ungraded assessments

Team project





American Society for Engineering Education President Bevlee Watford (left) presents the 2017 ASEE Excellence in Engineering Collaboration Award to Boeing executives Christi Gau Pagnanelli (center) and Mark Cousino.

Photo courtesy of ASEE.

ARCHITECTURE and SYSTEMS ENGINEERING:

MODELS and METHODS to MANAGE COMPLEX SYSTEMS

4-COURSE ONLINE CERTIFICATE PROGRAM

COURSE 1:
Architecture of Complex Systems

COURSE 2:
Models in Engineering

COURSE 3:
Model-Based Systems Engineering

COURSE 4:
Quantitative Methods in Systems Engineering

MIT PRESENTATION TO THE UN ITU

APPENDIX

WHAT THE DATA TELL US: COMPLEXITY OF COUNTRIES

Top 10

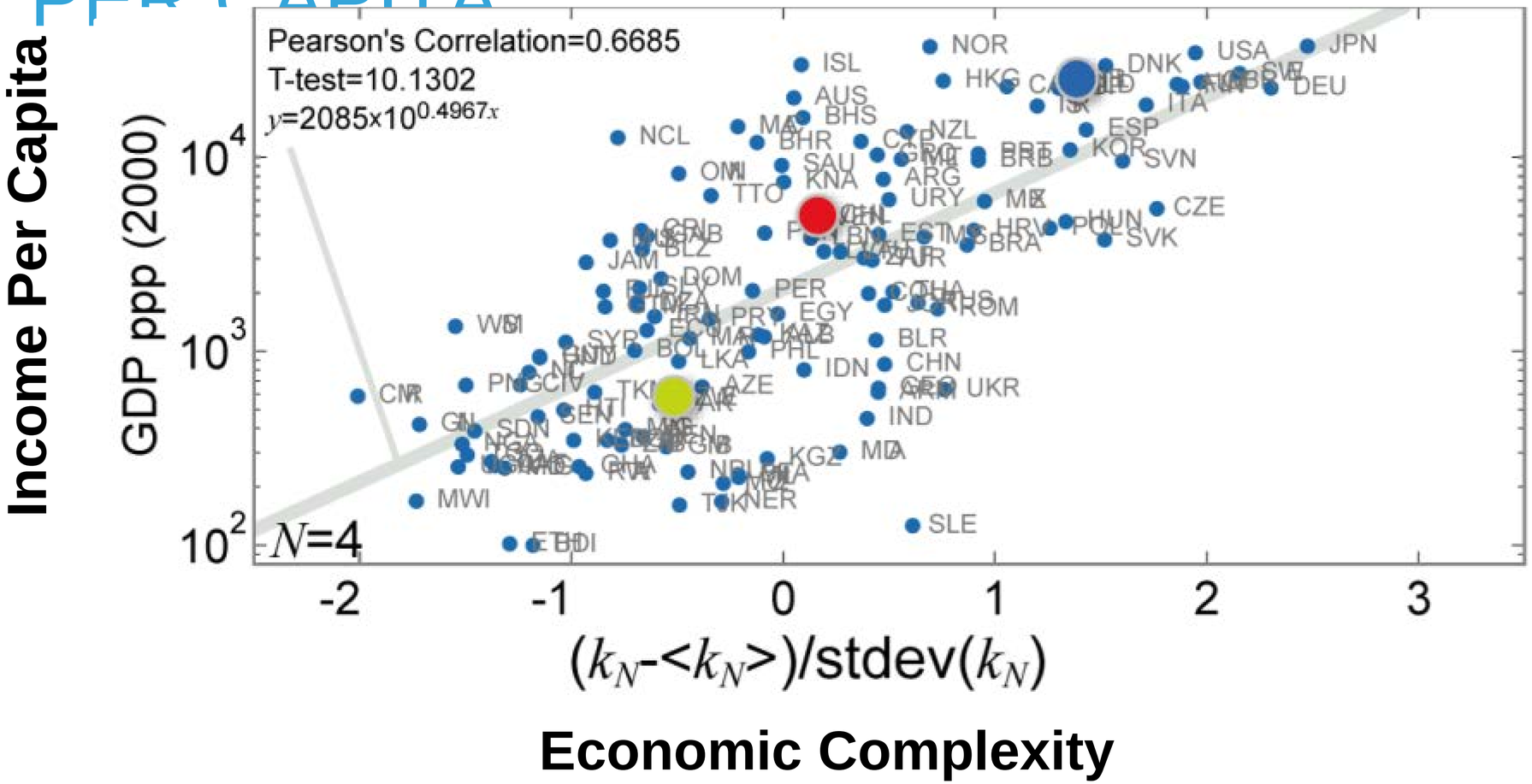
RANKING I. ECONOMIC COMPLEXITY INDEX

RANK ECI COMPLEXITY (2008)	REGIONAL ECI RANKING	COUNTRY NAME	ISO CODE	ECI 2008	RANK INCOME 2009 [USD]	INCOME 2009 [USD]	REGION
1	1/16	JAPAN	JPN	2.316	17	39,738	EAST ASIA AND PACIFIC
2	1/16	GERMANY	DEU	1.985	16	40,670	WESTERN EUROPE
3	2/16	SWITZERLAND	CHE	1.935	3	63,629	WESTERN EUROPE
4	3/16	SWEDEN	SWE	1.859	13	43,654	WESTERN EUROPE
5	4/16	AUSTRIA	AUT	1.807	10	45,562	WESTERN EUROPE
6	5/16	FINLAND	FIN	1.715	11	44,581	WESTERN EUROPE
7	2/16	SINGAPORE	SGP	1.639	19	36,537	EAST ASIA AND PACIFIC
8	1/27	CZECH REPUBLIC	CZE	1.628	29	18,139	EASTERN EUROPE AND CENTRAL ASIA
9	6/16	UNITED KINGDOM	GBR	1.558	20	35,165	WESTERN EUROPE
10	2/27	SLOVENIA	SVN	1.523	27	23,726	EASTERN EUROPE AND CENTRAL ASIA

Bottom 5

124	16/16	PAPUA NEW GUINEA	PNG	-1.577	100	1,172	EAST ASIA AND PACIFIC
125	23/26	CONGO, REP.	COG	-1.707	85	2,601	SUB-SAHARAN AFRICA
126	24/26	SUDAN	SDN	-1.768	98	1,294	SUB-SAHARAN AFRICA
127	25/26	ANGOLA	AGO	-1.793	75	4,081	SUB-SAHARAN AFRICA
128	26/26	MAURITANIA	MRT	-1.907	113	919	SUB-SAHARAN AFRICA

“INPUT” DIVERSITY EXPLAINS INCOME PER CAPITA



Hidalgo, Hausmann (2009) *PNAS* 106(**26**):10570-10575