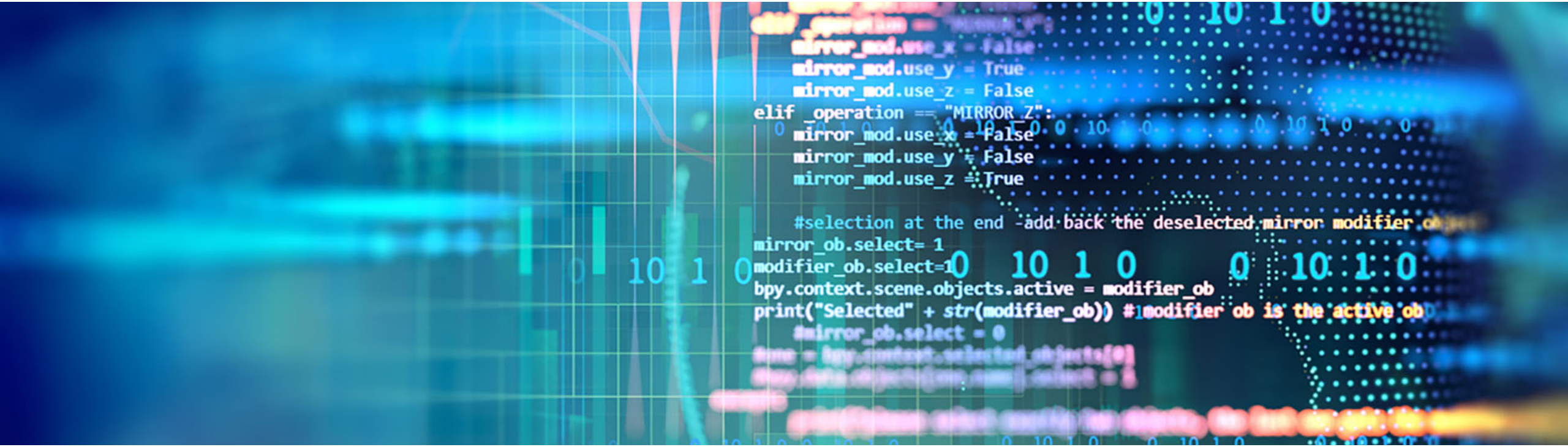
Silver Bullets, Killer Apps,
and the Transformation of the Golden Paradigm



Myk Garn, PhD
Assistant Vice Chancellor for New Learning Models
University System of Georgia

The Opportunity Space Where Teaching and Learning is Catalyzed by Technology

Myk Garn, PhD
Assistant Vice Chancellor for New Learning Models

UNIVERSITY SYSTEM OF GEORGIA

Tele-Learning
Virtual University
EdTech Cooperative
State HE-DL Director
Internet Start-up
New Learning Models

NSF Institute for Artificial Intelligence in Adult Learning and Online Education

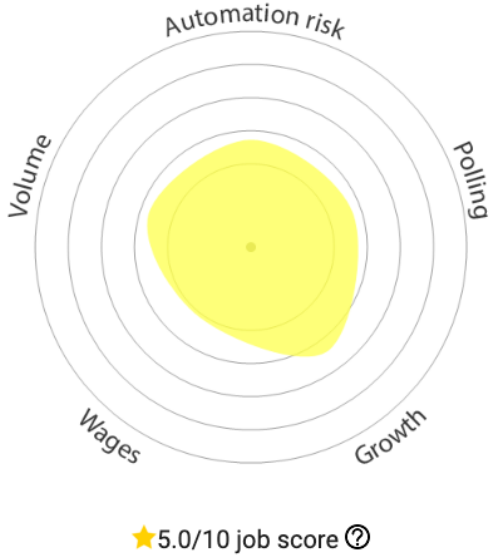
Principal Investigator

AL Research
Embedded Tutors
Feedback Loops
Data Repository

Will there be LESS Technology?

Will Robots Take YOUR Job?

Quality Control Analysts



★5.0/10 job score ⓘ

AUTOMATION RISK
52%
risk level

POLLING
There hasn't been enough votes on this occupation yet

GROWTH
8.3%
by 2030

WAGES
$52,460
or $25.22 hourly

VOLUME
62,080
as of 2020

https://willrobotstakemyjob.com/

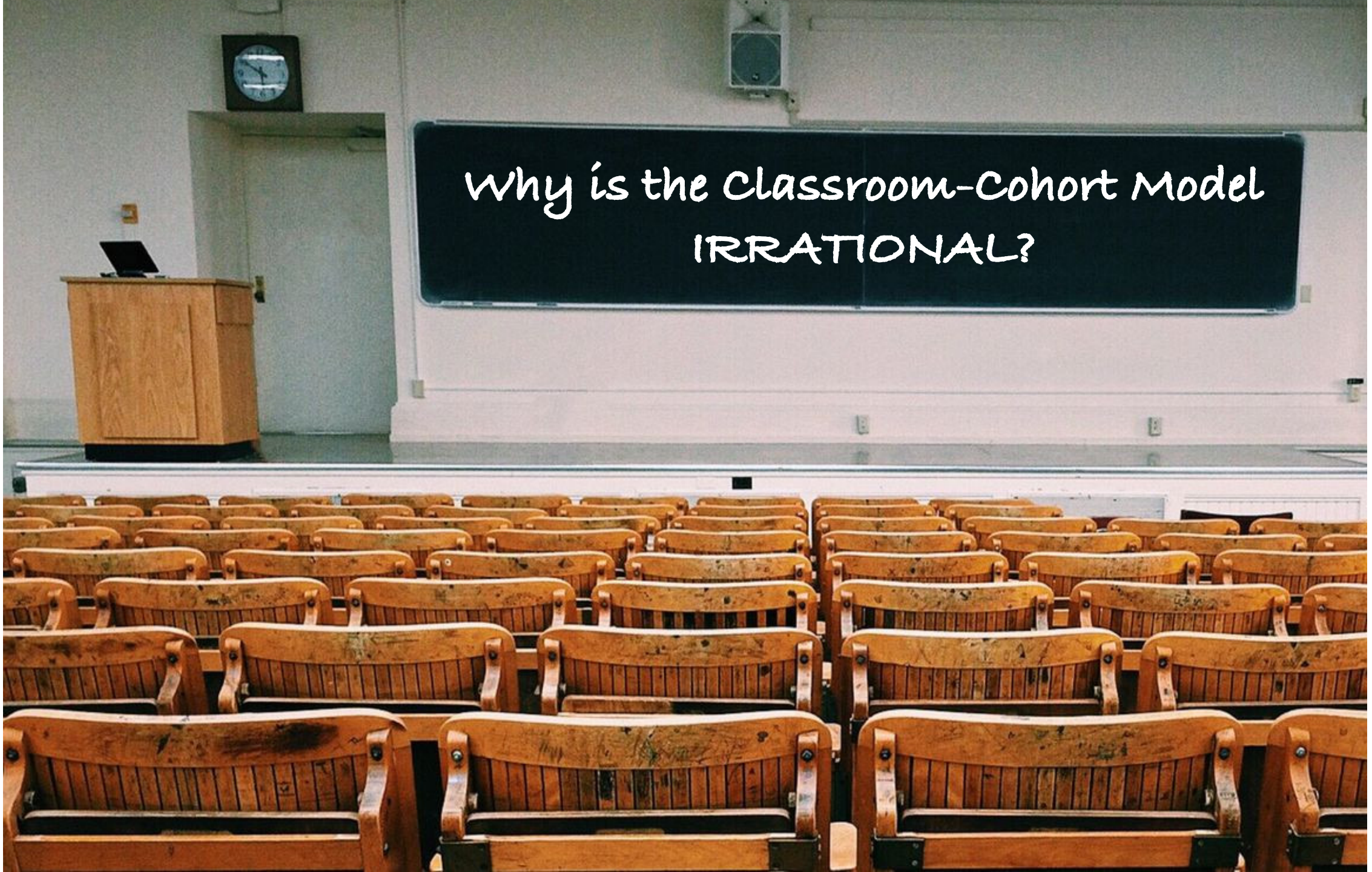
HYPOTHESES:

The Gold Standard of Classroom instruction
is both irrational and inappropriate.

Technology enables new ways to address the embedded biases
and limitations of current teaching and learning models.

New Learning Models using AI can make
assessing Quality of Digital Instruction
more equitable, efficient, effective, and transparent.

The Classroom-Cohort Instructional Model is Irrational


Why is the Classroom-Cohort Model
IRRATIONAL?

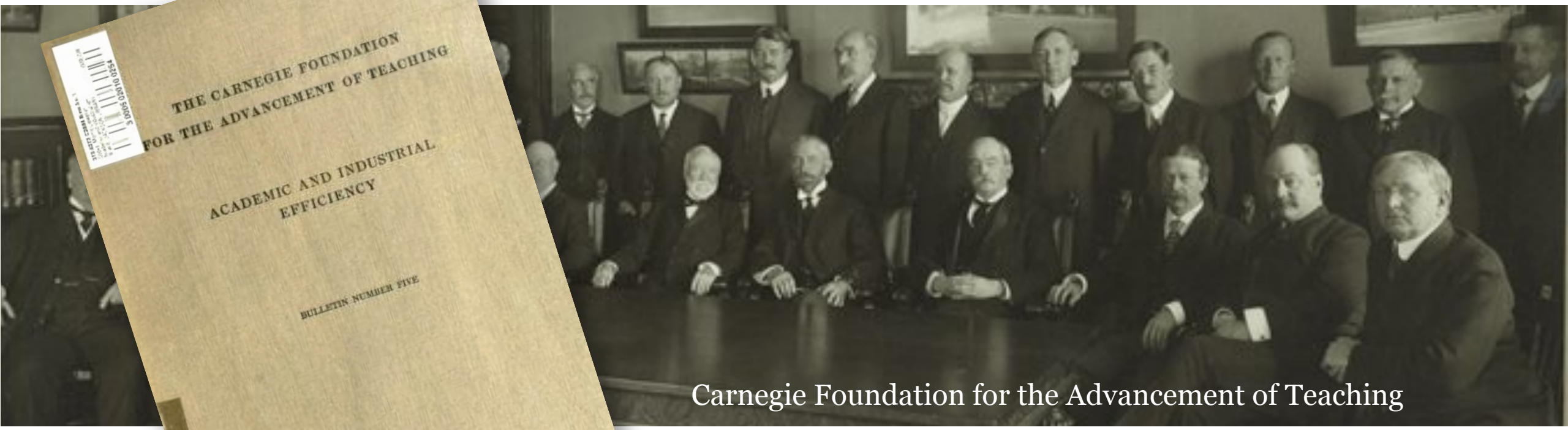
How Time is Used Makes a Difference

We Use Time Wrong

Teaching and Learning Takes Time

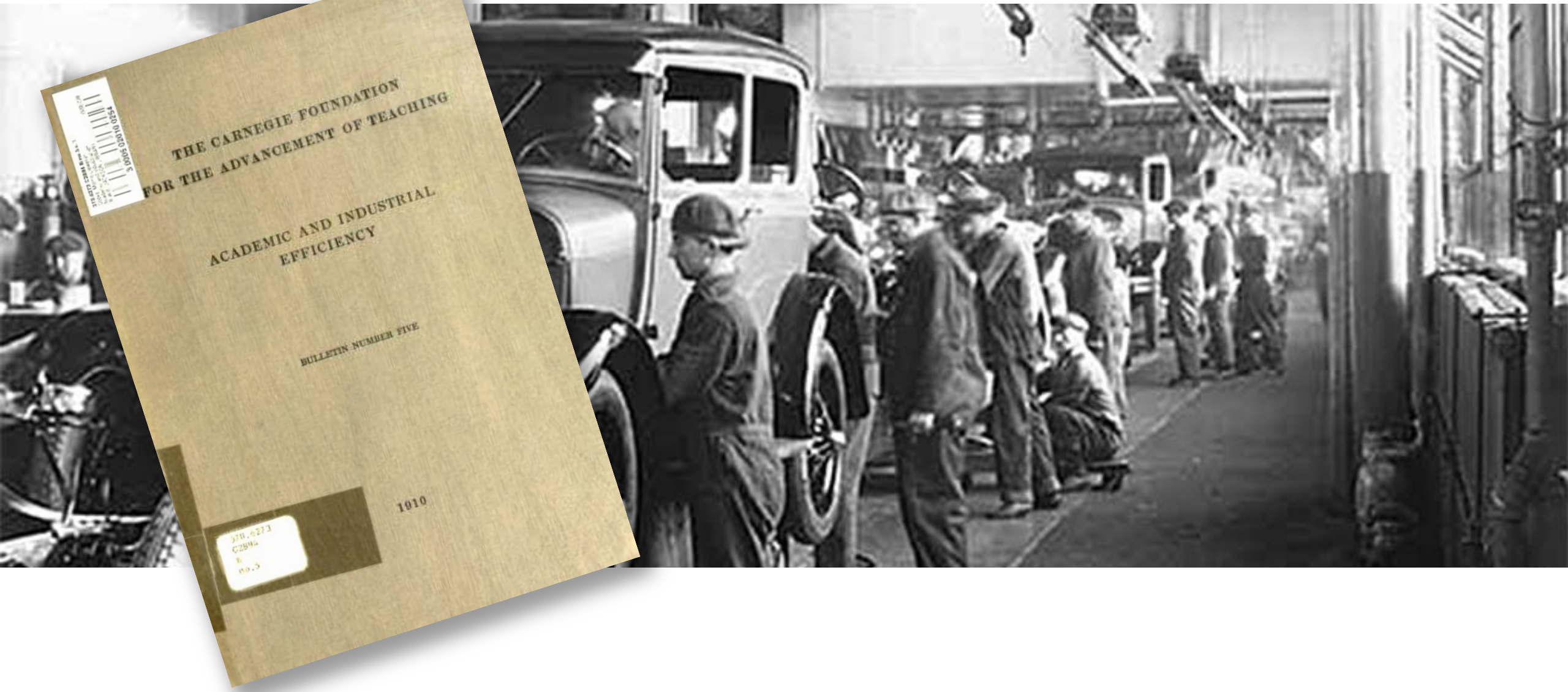
Teachers can only teach so many students

Driving the Models of Education



Carnegie Foundation for the Advancement of Teaching

The Assembly Line is a Game Changer



Classroom Cohorts Save Time

The 20th Century Assembly Line Model of Education

EVERY STUDENT HAS AN EQUAL OPPORTUNITY TO LEARN

Term-Based Models Give Students EQUAL TIME to Learn

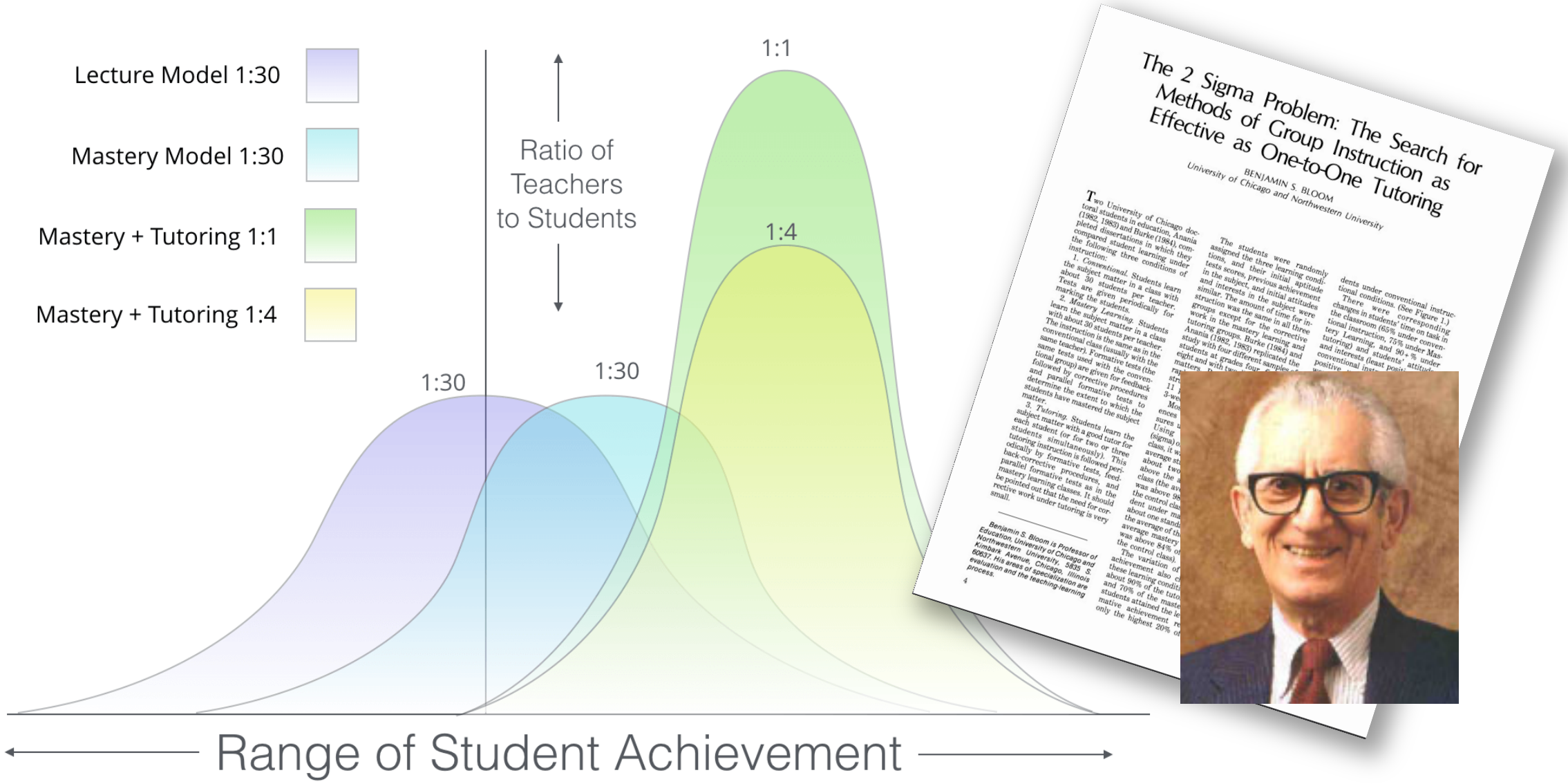
How LONG You Have to Learn It

15 WEEK TERMS

WHAT YOU NEED TO LEARN

HOW WELL YOU LEARNED IT

Why is That Irrational?



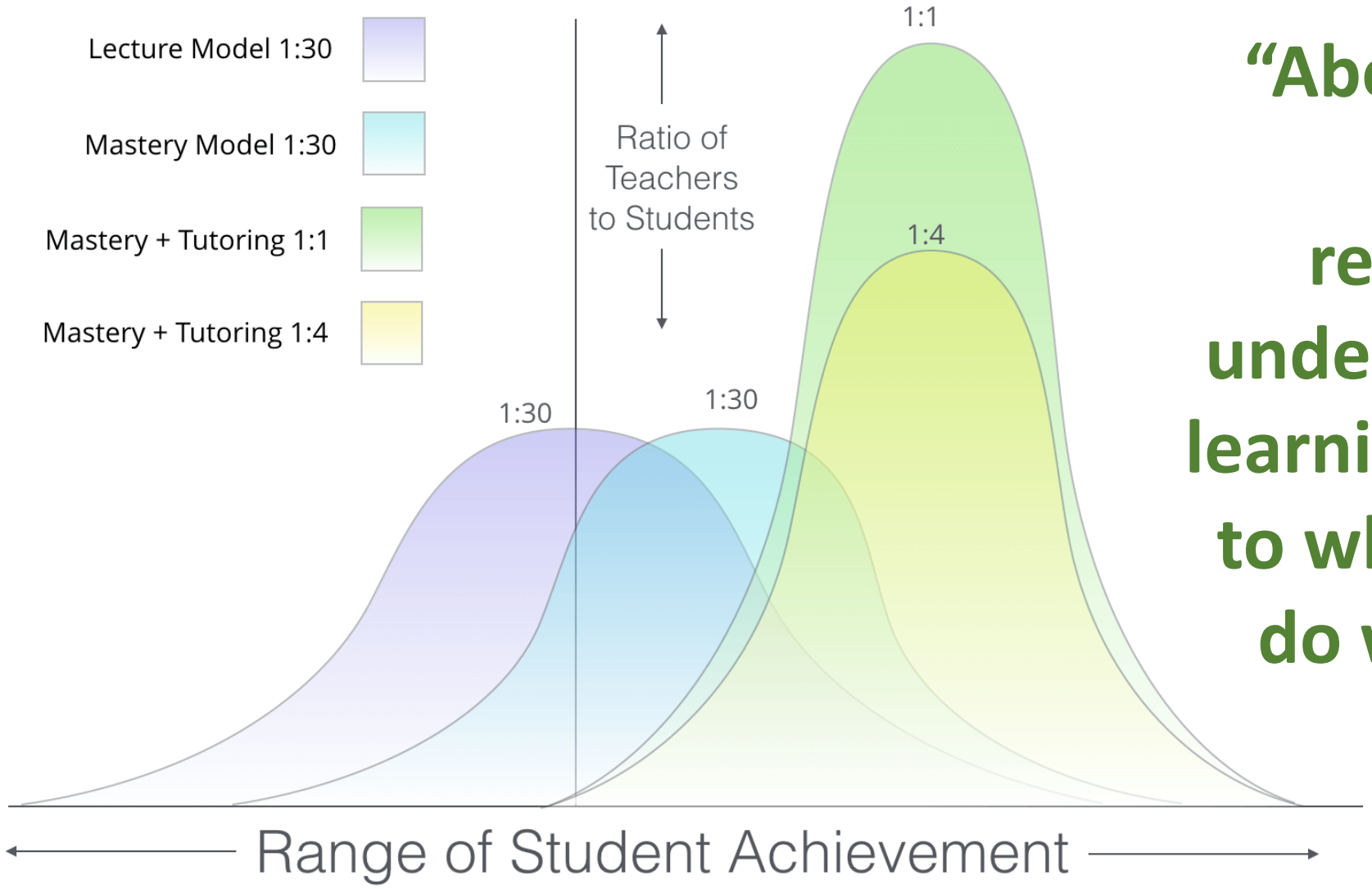
The 2 Sigma Problem: The Search for Methods of Group Instruction as Effective as One-to-One Tutoring

BENJAMIN S. BLOOM
University of Chicago and Northwestern University

Quanititas

https://web.mit.edu/5.95/www/readings/bloom-two-sigma.pdf

Efficient – but NOT EFFECTIVE



"About 80% of the students do relatively poorly under conventional learning as opposed to what they might do with tutoring."

https://web.mit.edu/5.95/www/readings/bloom-two-sigma.pdf

Mastery Means More Students LEARN

“The tutoring process demonstrates that most students do have the potential to reach this high level of learning (mastery).”

Mastery Means More Students SUCCEED

“Students receiving mastery learning did better than 84% of conventionally instructed students.”

Competency-Based Learning Model

KEEP LEARNING CONSTANT
MAKE TIME THE VARIABLE

WHAT YOU NEED TO LEARN

The TIME it Takes You to Learn It

?

DEMONSTRATED MASTERY

Every Student Gets the TIME THEY NEED to Achieve Mastery

WGU

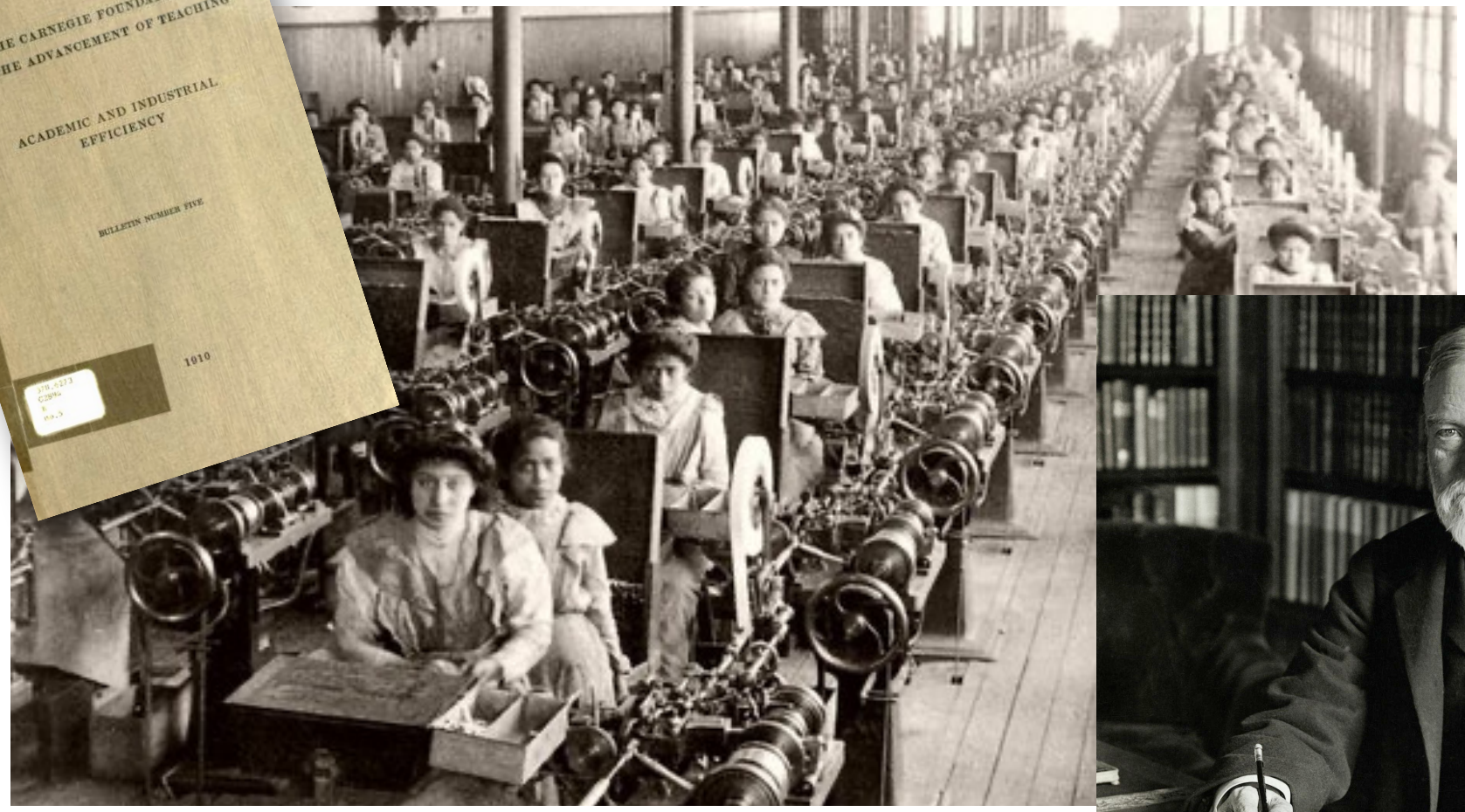
WESTERN GOVERNORS UNIVERSITY

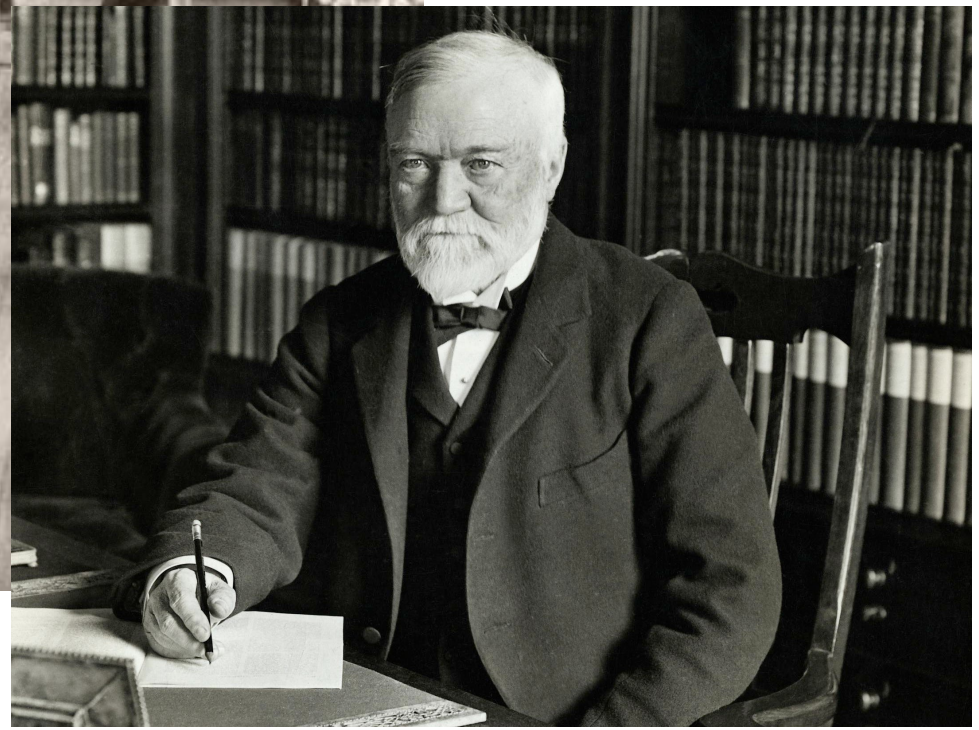
WGU

WESTERN GOVERNORS UNIVERSITY


Why is the Classroom-Cohort Model
INAPPROPRIATE?

The Values of Industry

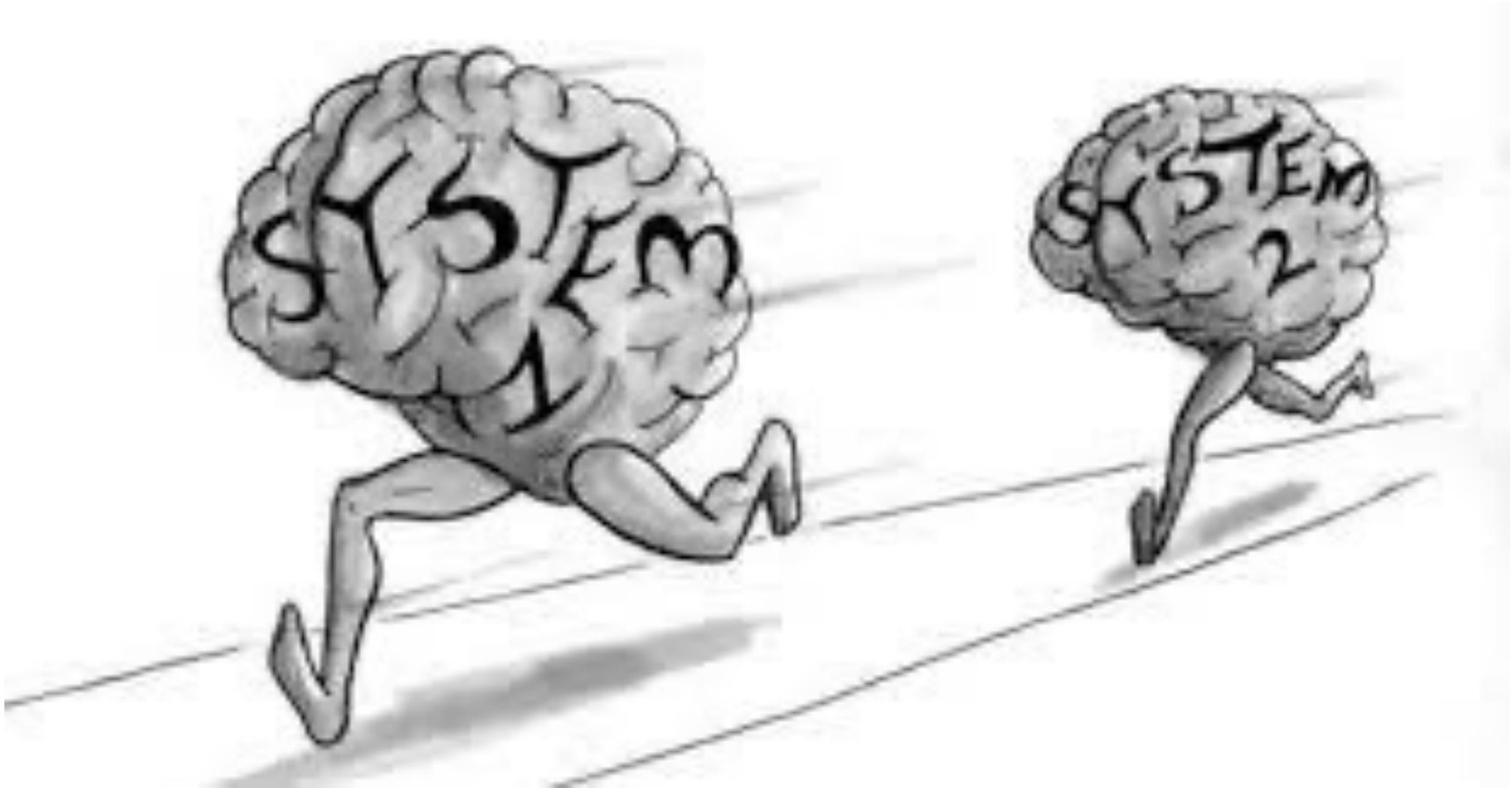




Faster Workers Means More Profit

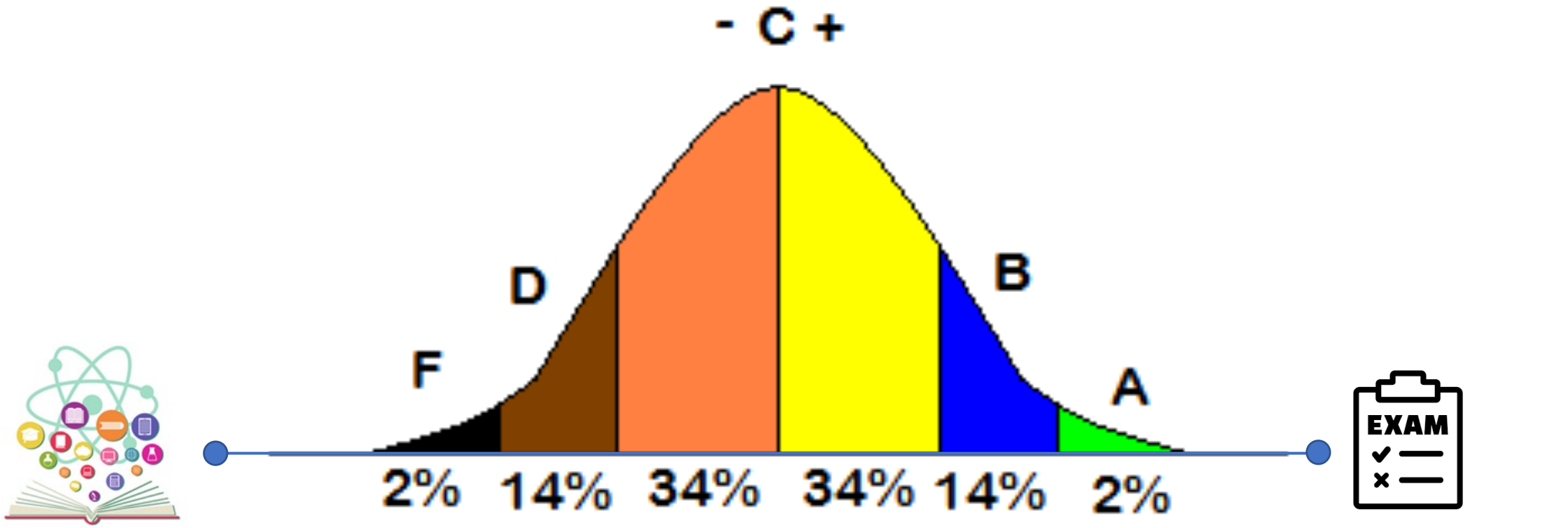
Leveraging Cognitive ‘Science’

“Faster Thinkers are Smarter People”



Measuring ‘Quality’ in Cohorts

The Bell-shaped Curve

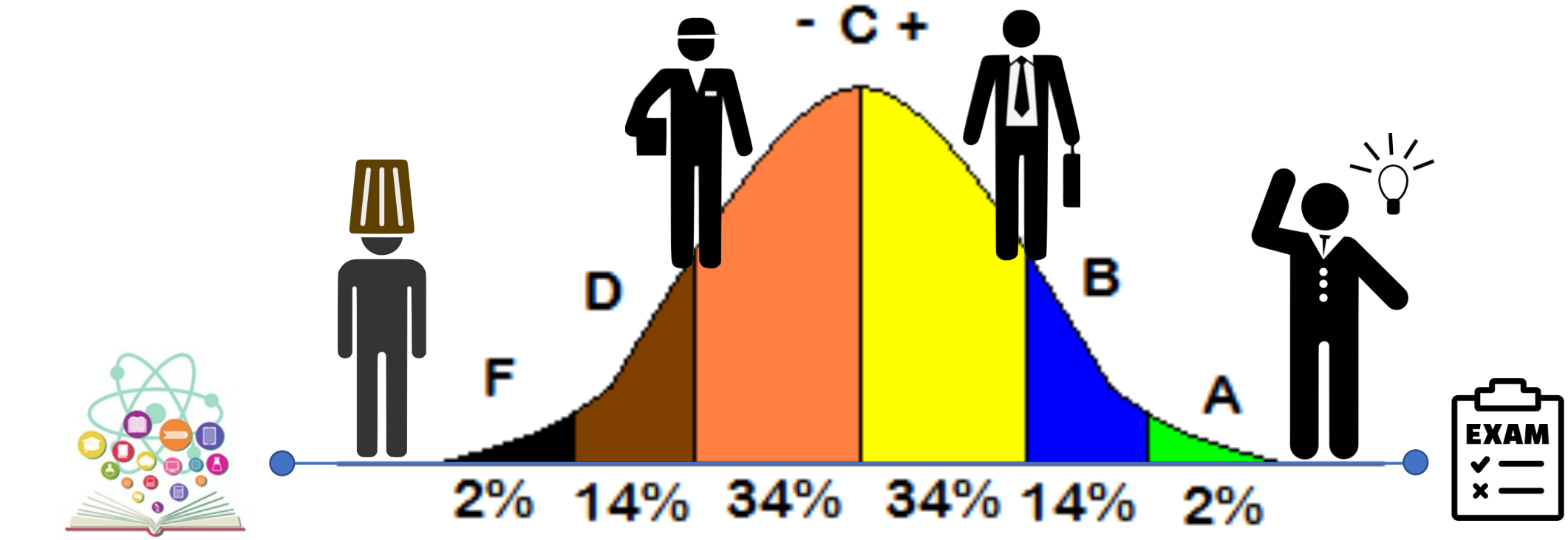


WHAT YOU NEED TO LEARN

HOW WELL YOU LEARNED IT

Meeting the Needs of Industry

Ranking & Sorting by Fast Thinking



WHAT YOU NEED TO LEARN

HOW WELL YOU LEARNED IT

The Gold Standard of Classroom instruction is both irrational and inappropriate

Equal is not Equitable

The classroom-cohort model ranks & sorts using equal time limits to the disadvantage of 80% of learners

Making Time the Variable

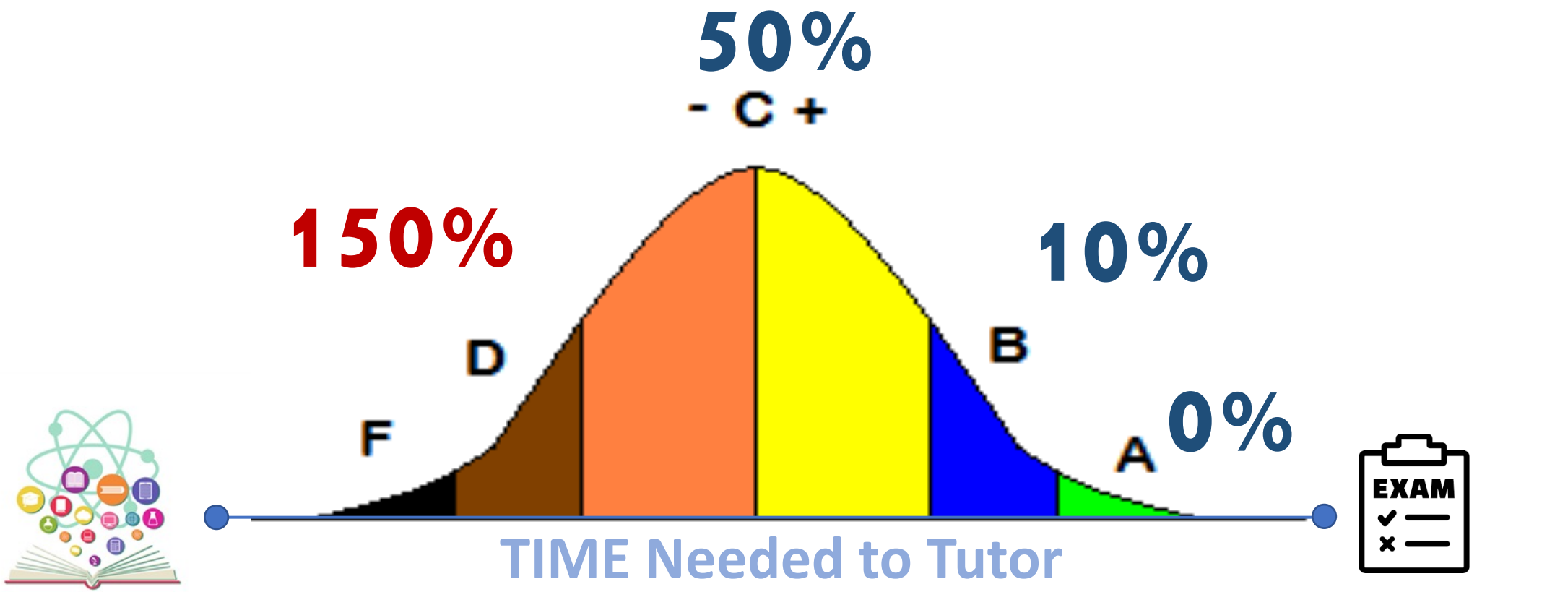
The competency-based model gives individuals time to learn so 84% (or more) of learners can achieve mastery

So…Why Don't We See More Use of Mastery/CBE?

80% of Students need MORE time to learn

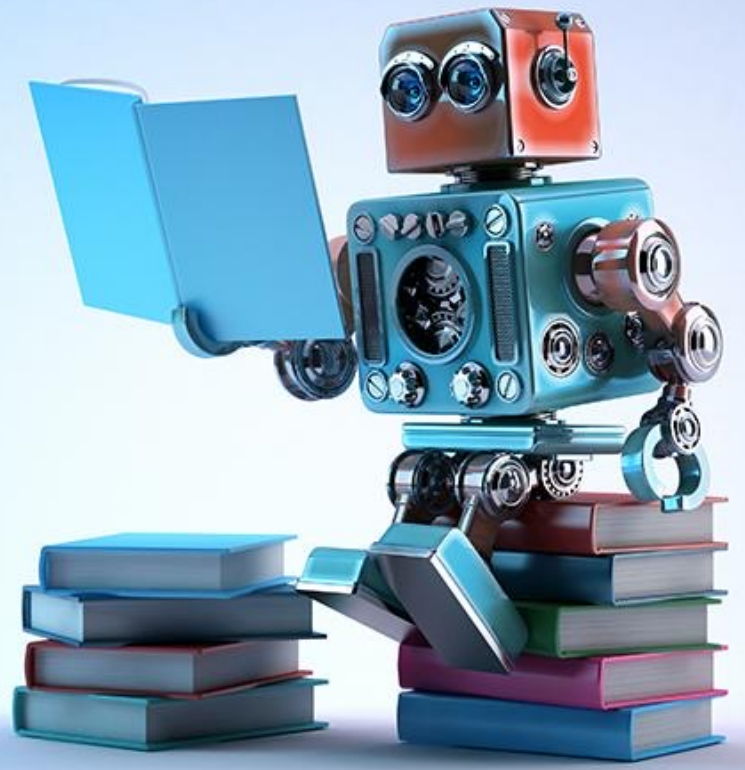
Managing Students Learning at Different Paces is Hard

Tutoring Takes EXTRA TIME



Hypothesis Two

Technology enables new ways to address the embedded biases and limitations of current teaching and learning models.



The Search for Silver Bullets

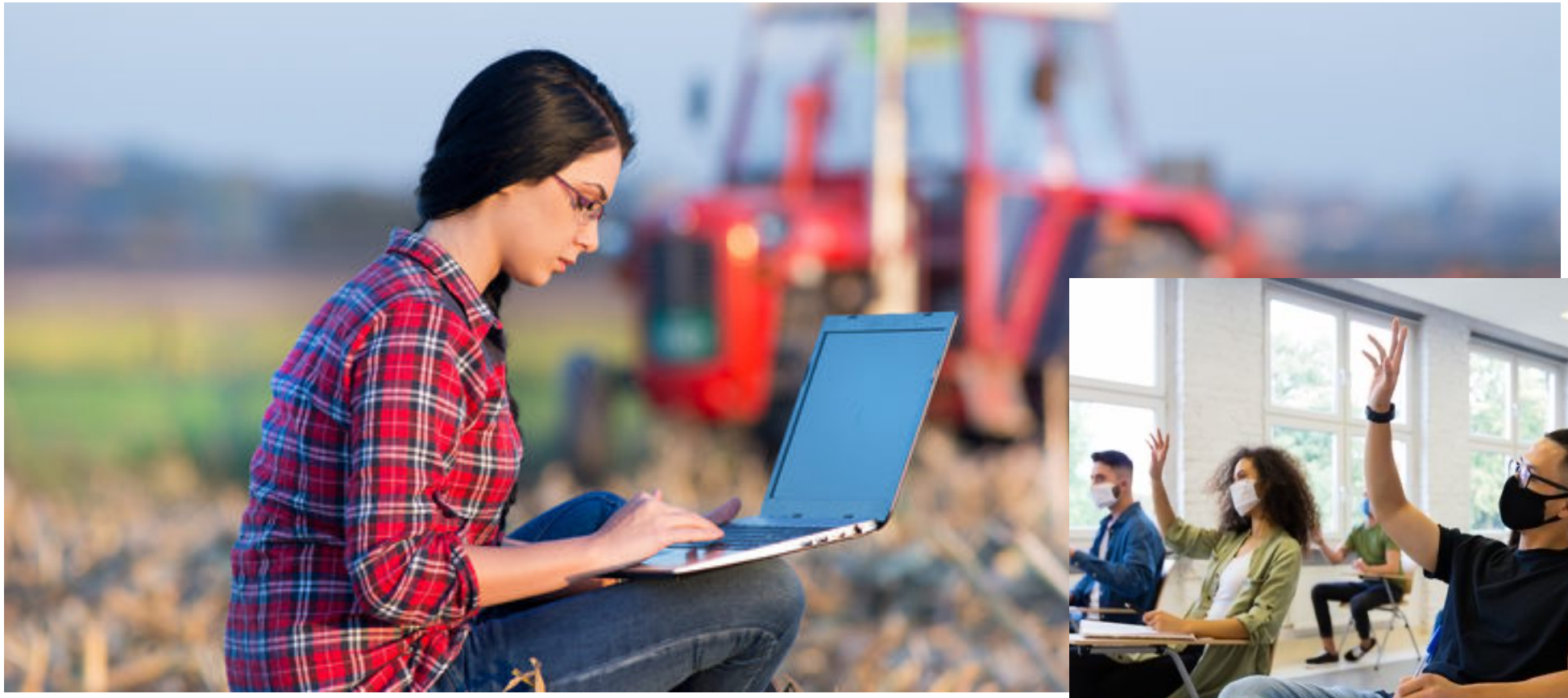
Is Online Learning a Silver Bullet?

1st Generation Technology

Access
Flexible Times
CBE

Gold Standard: The Classroom is the best PLACE to Learn

Unless you can’t get to the classroom…



Defining Learning at a Distance

Technology CONNECTS Learners to Teachers

Is Artificial Intelligence a Silver Bullet?

2nd Generation Technology

Adaptive Learning

Is Artificial Intelligence a Silver Bullet?

2nd Generation Technology

Adaptive Learning

Feedback when and where learners need it

Is Artificial Intelligence a Silver Bullet?

2nd Generation Technology

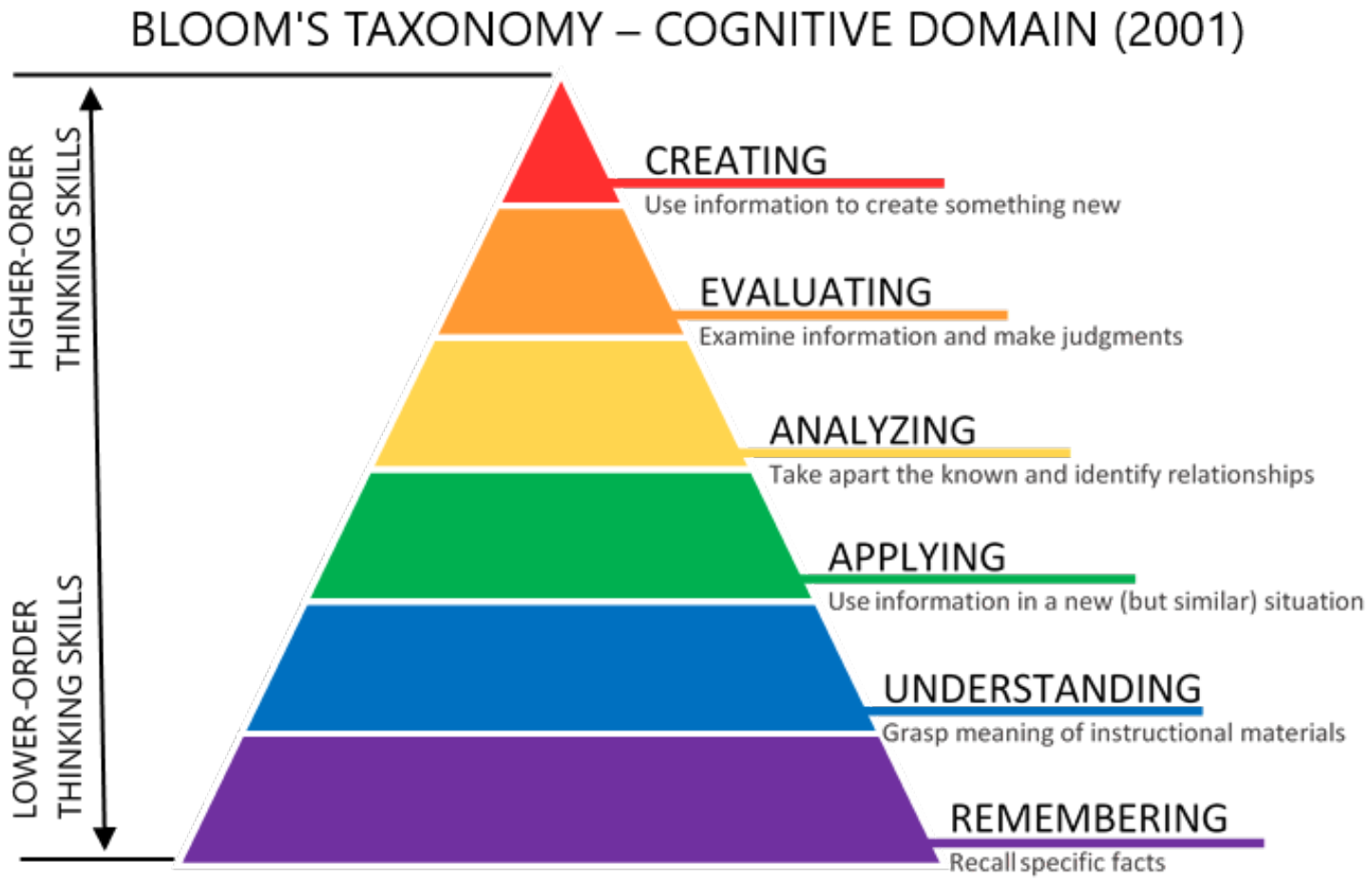
Adaptive Learning

Individual Feedback@ Scale

Is Artificial Intelligence a Silver Bullet?

2nd Generation Technology

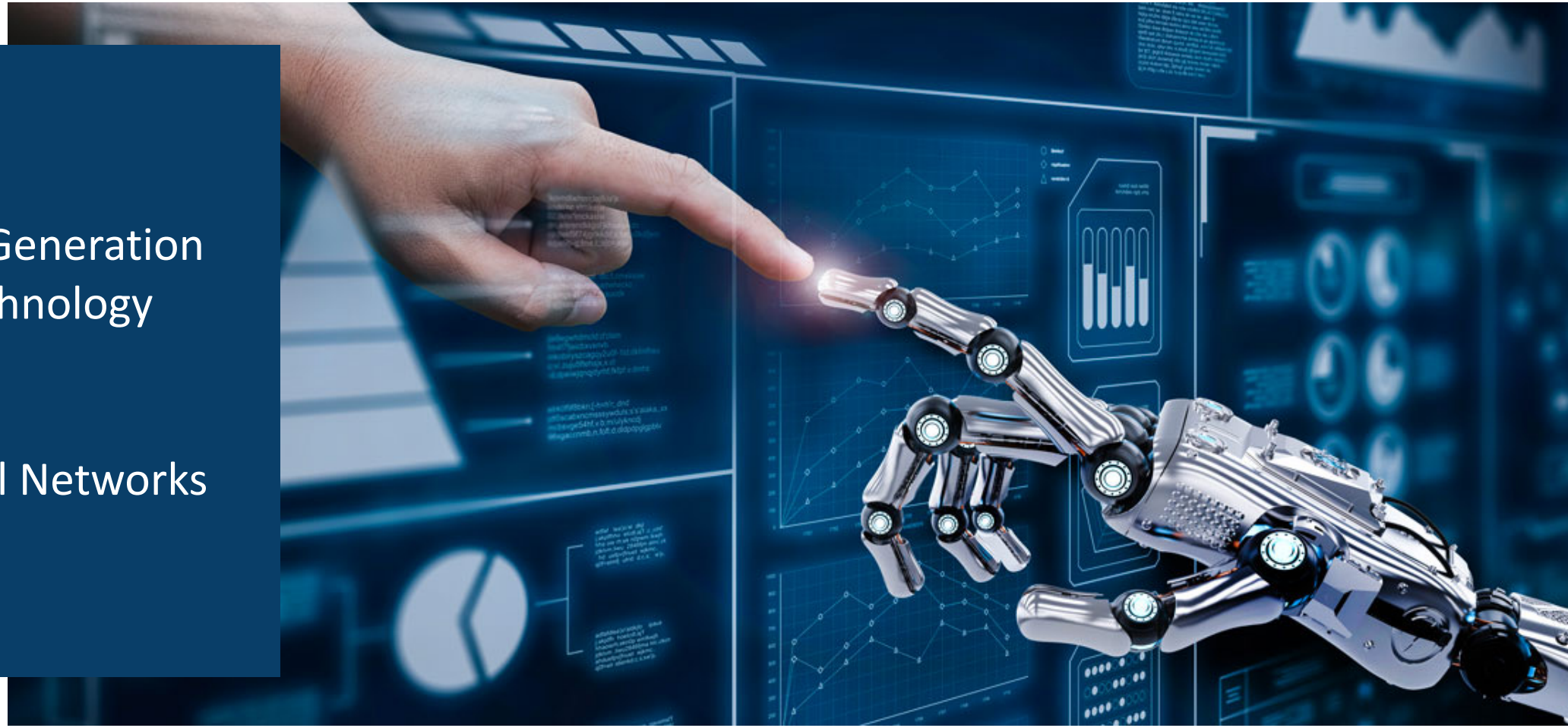
Adaptive Learning



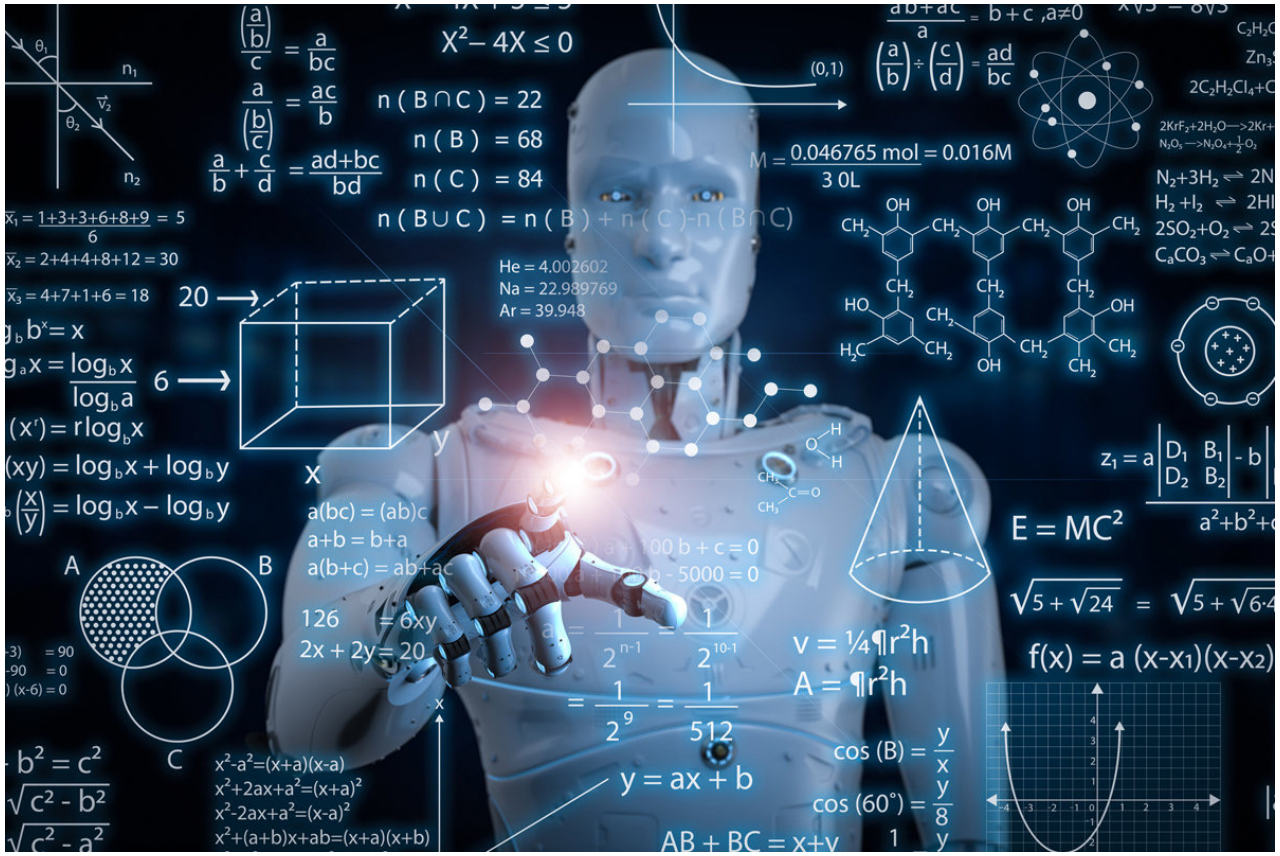
Is Artificial Intelligence a Silver Bullet?

Next Generation Technology

Neural Networks



Computers are FASTER than Humans - But they are not SMARTER

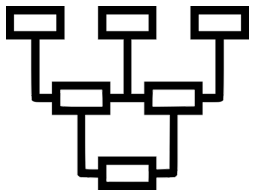


"Currently, there exists no machine that can outperform a typical human at any given task, with the exceptions of digital speed and chance."

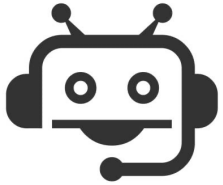
Tristan Greene, **A beginner's guide to AI: Machine superiority**

AI Development Timeline

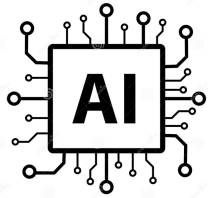
We are here!



Differentiated Response



Conversational Agents



Individualized Feedback

Personal Tutors

Embedded Students

Virtual Professors

Hard-coded Branching
Natural Language Processing (NLP)

Adaptive Algorithms
Machine Learning

Neural Networks
Metaverse

Moravec's Paradox

What is hard for Humans is easy for Computers

Delivering instruction to 30 different students in 30 different locations

Moravec's Paradox

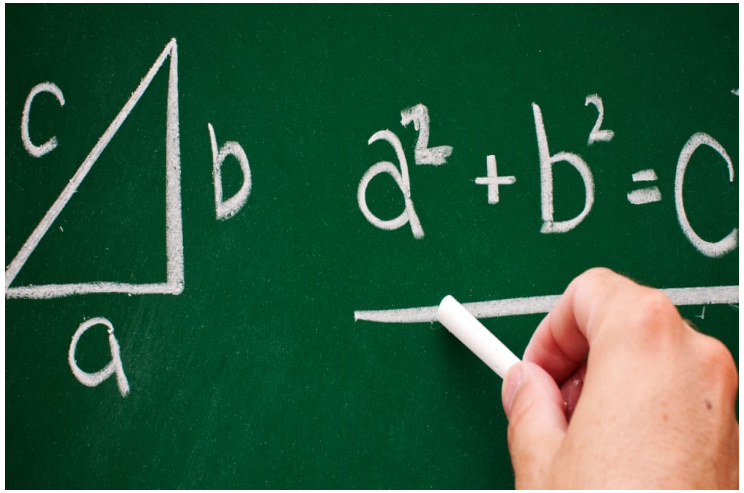
What is easy for Humans is hard for Computers

Knowing what a student needs to solve a problem

Hypothesis Three

Digital Forward Learning Models
can make assessing Quality
more equitable, efficient, effective, and transparent.

What's Important?



MATH

WRITING

What's Important?

Knewton
A Wiley Brand

CENGAGE Learning™

Pearson
REVEL

HAWKES LEARNING

macmillan learning

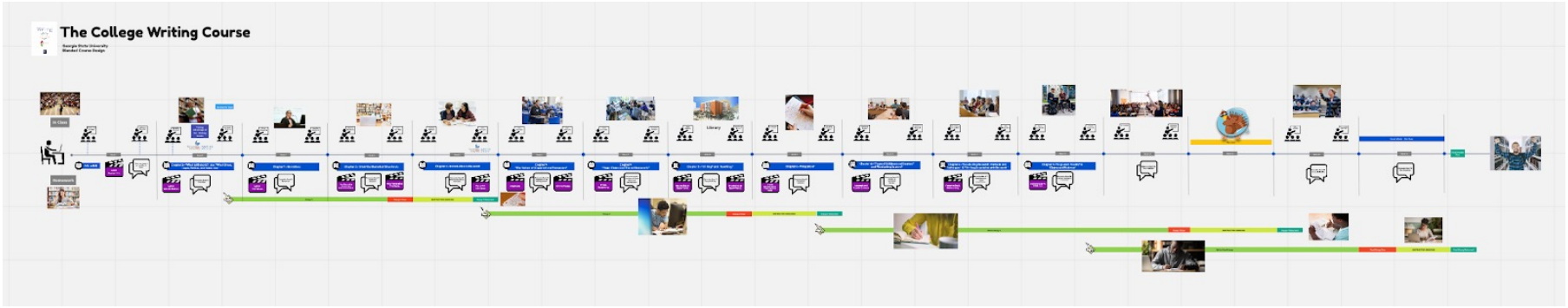
Realize it™

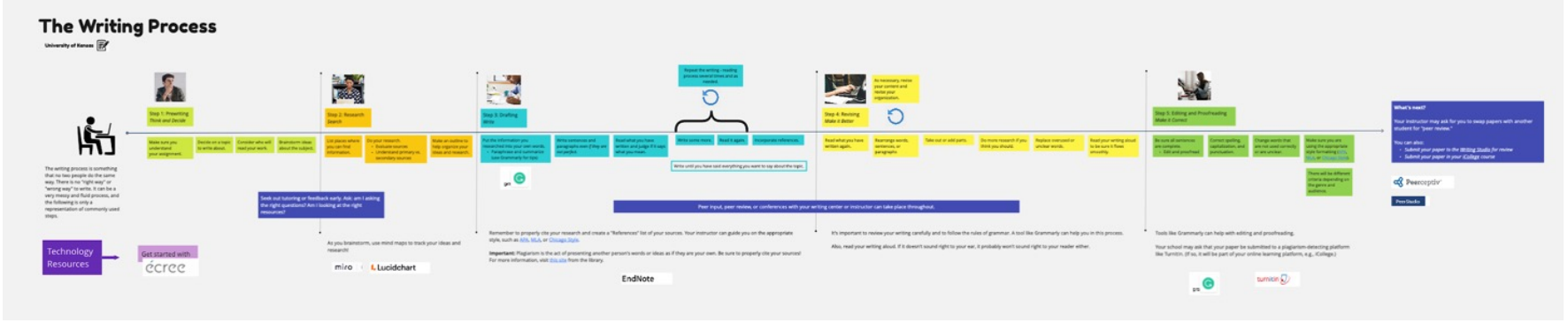
MATH

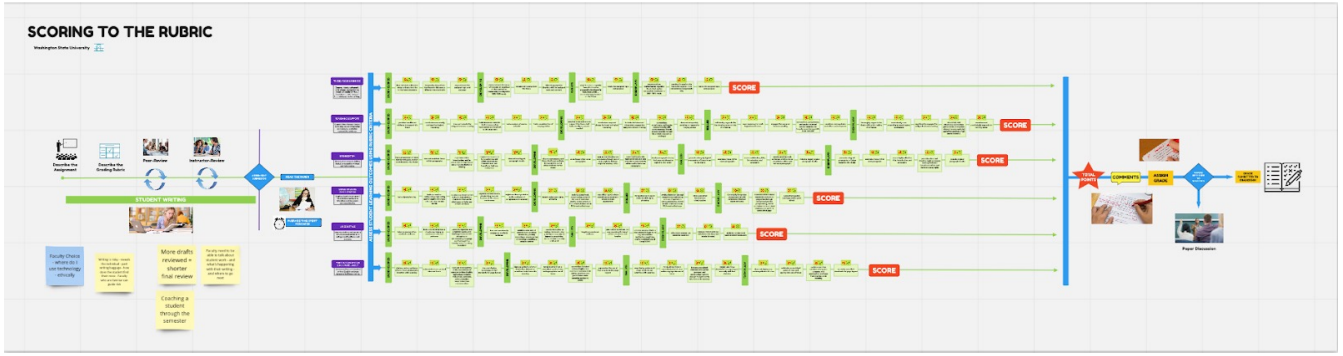
WRITING

Digital Forward Design

User Journeys

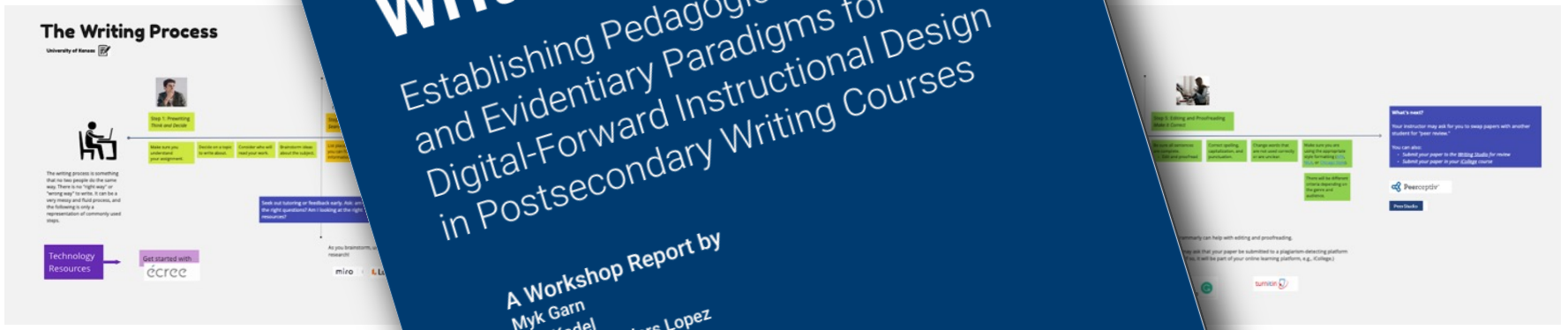


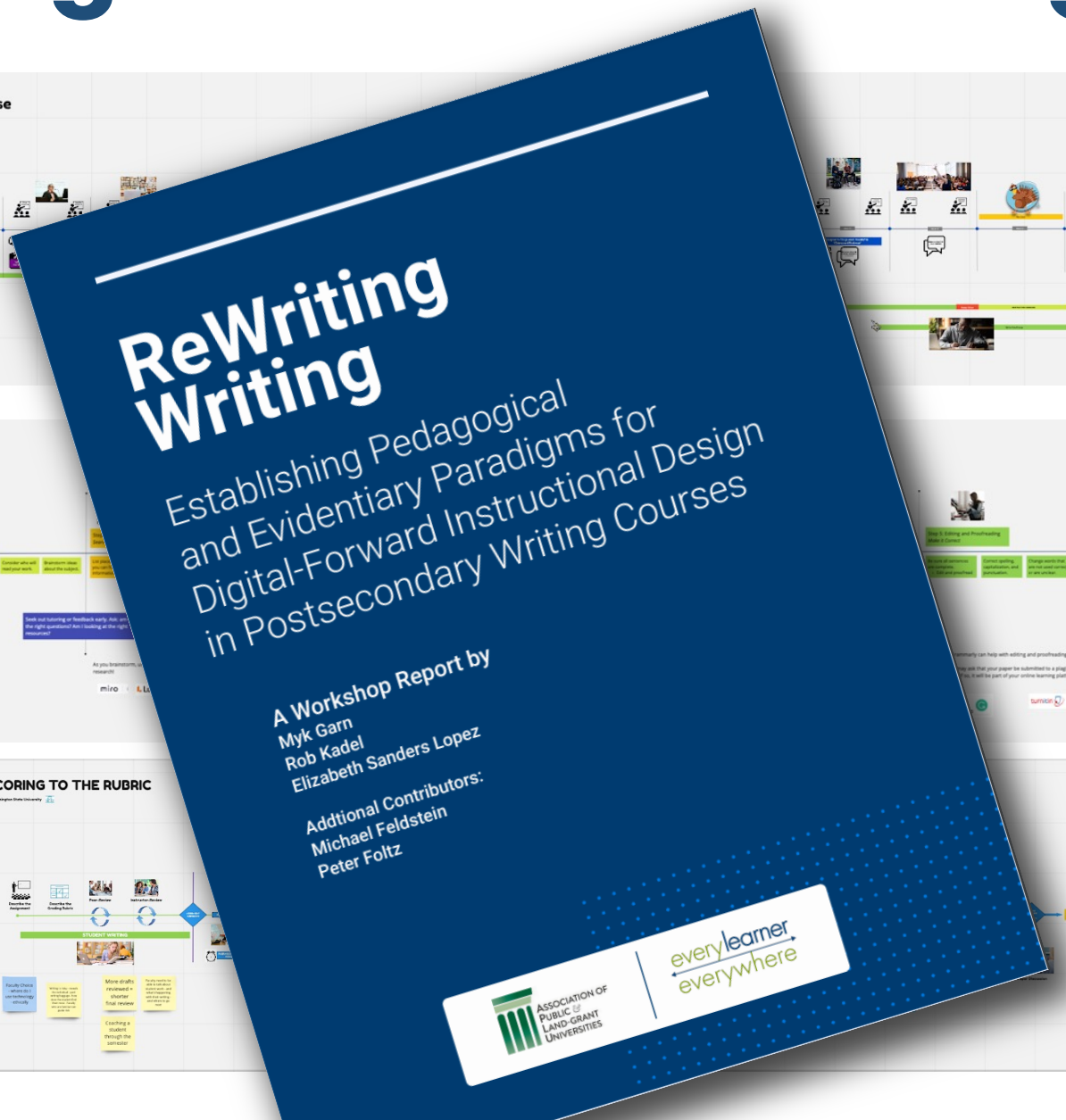




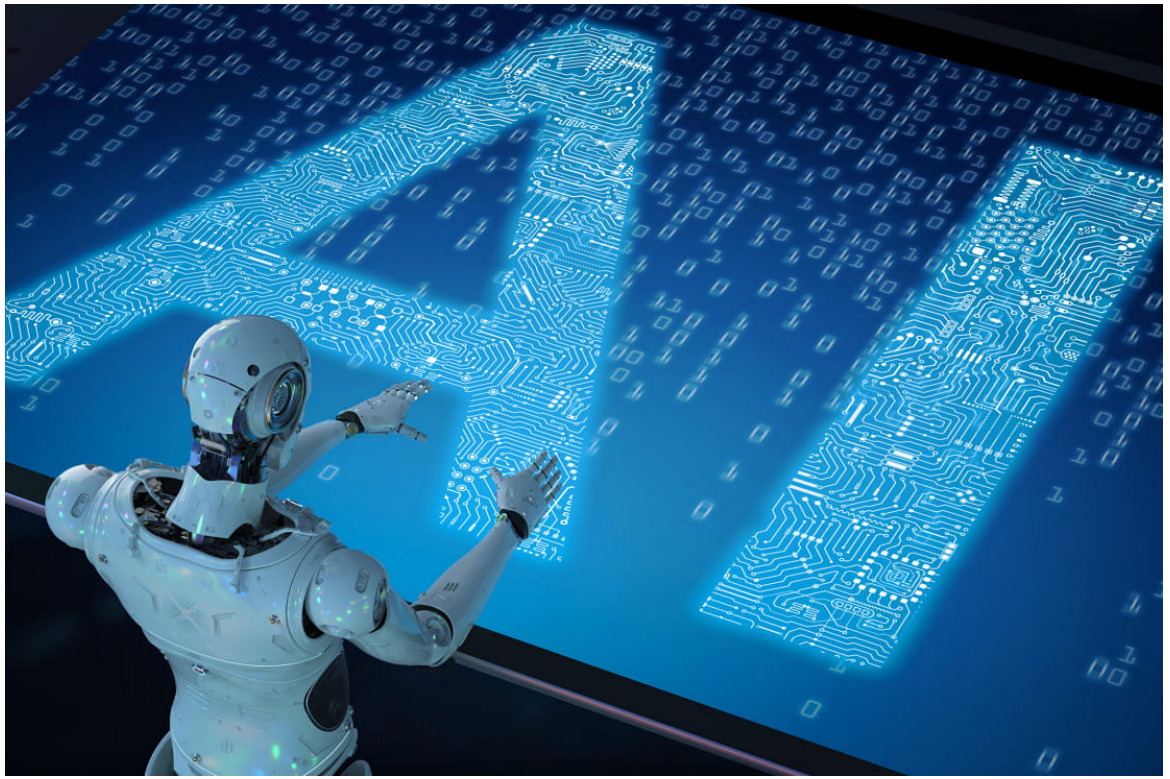
Digital Design Tools

Digital Forward Design





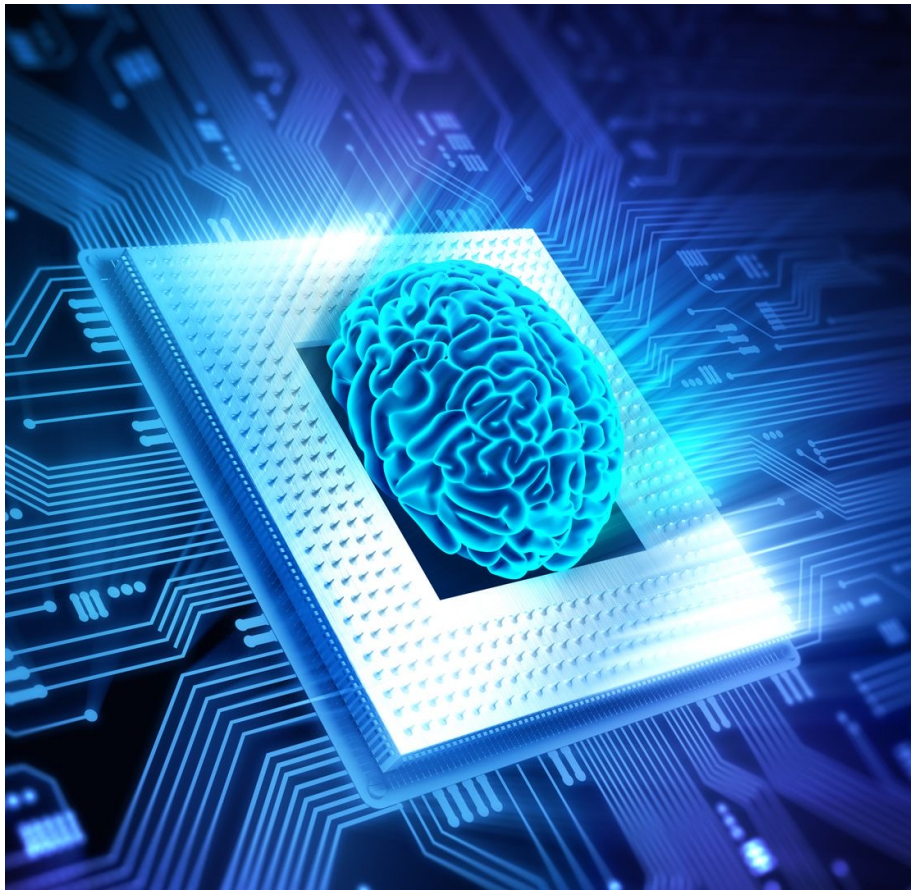
What are the Synergies between Artificial and Human Intelligence and How can we Optimize Them?



Data Data Data

Adaptive Technologies

Neural Networks

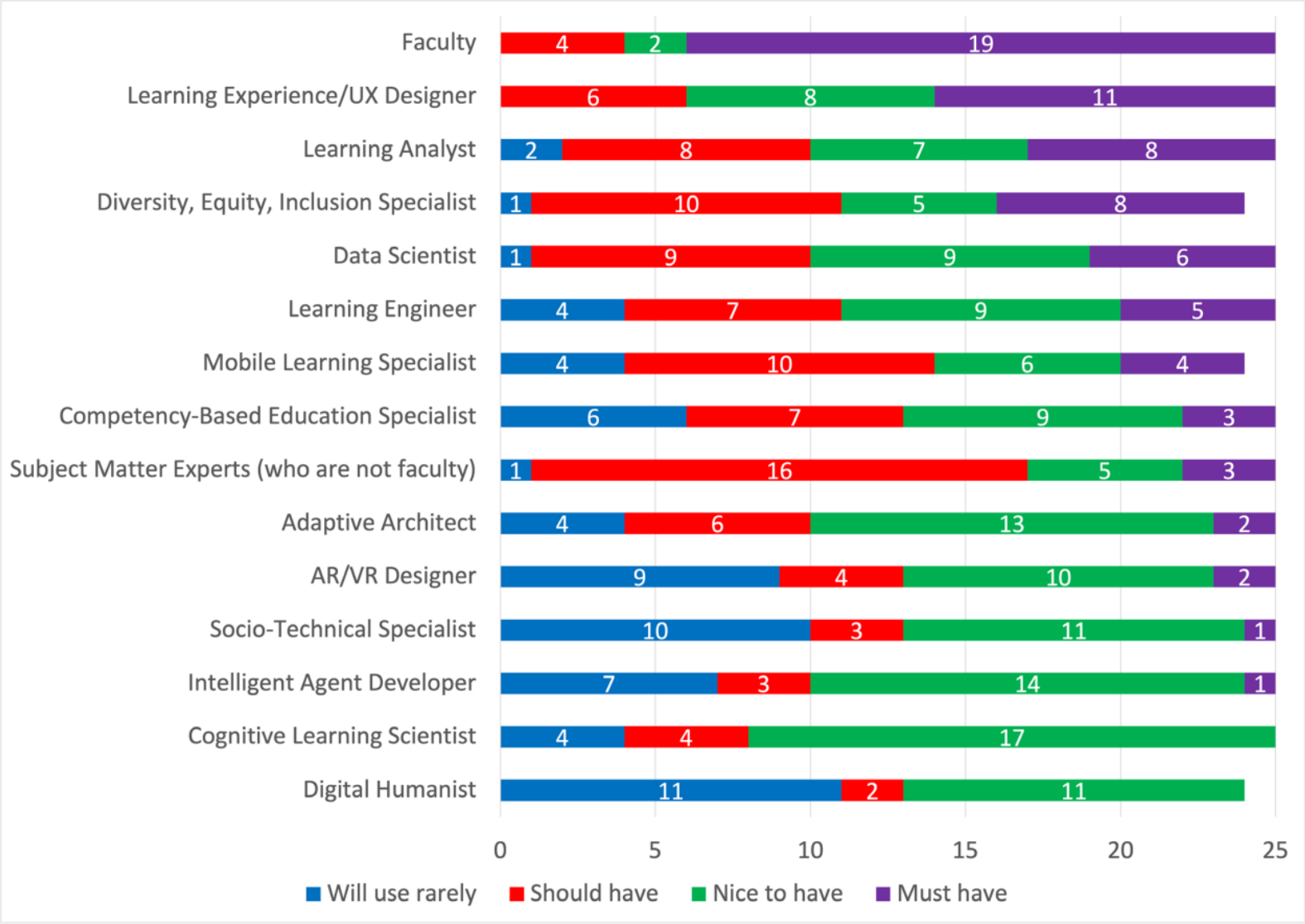


The important point is that the network generalized. It was able to predict new words it had never seen before.

Terrence Sejnowski, biophysicist, Johns Hopkins University, NetTalk

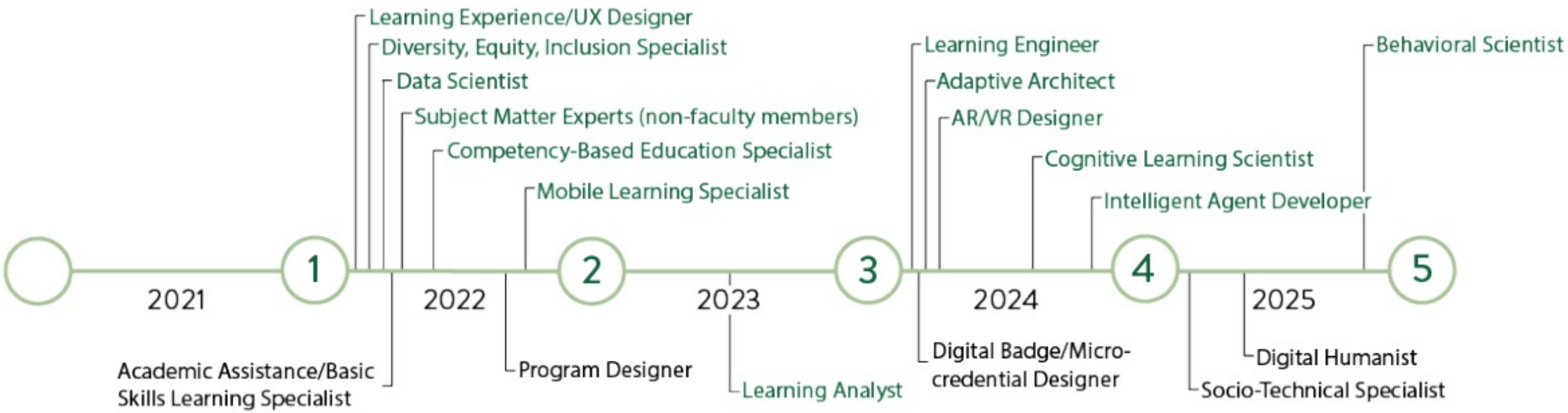
METAVERSE

New Digital Forward Roles



New Digital Forward Skills & Roles

When Will Emerging Roles Emerge?



Indicators of Digital Quality

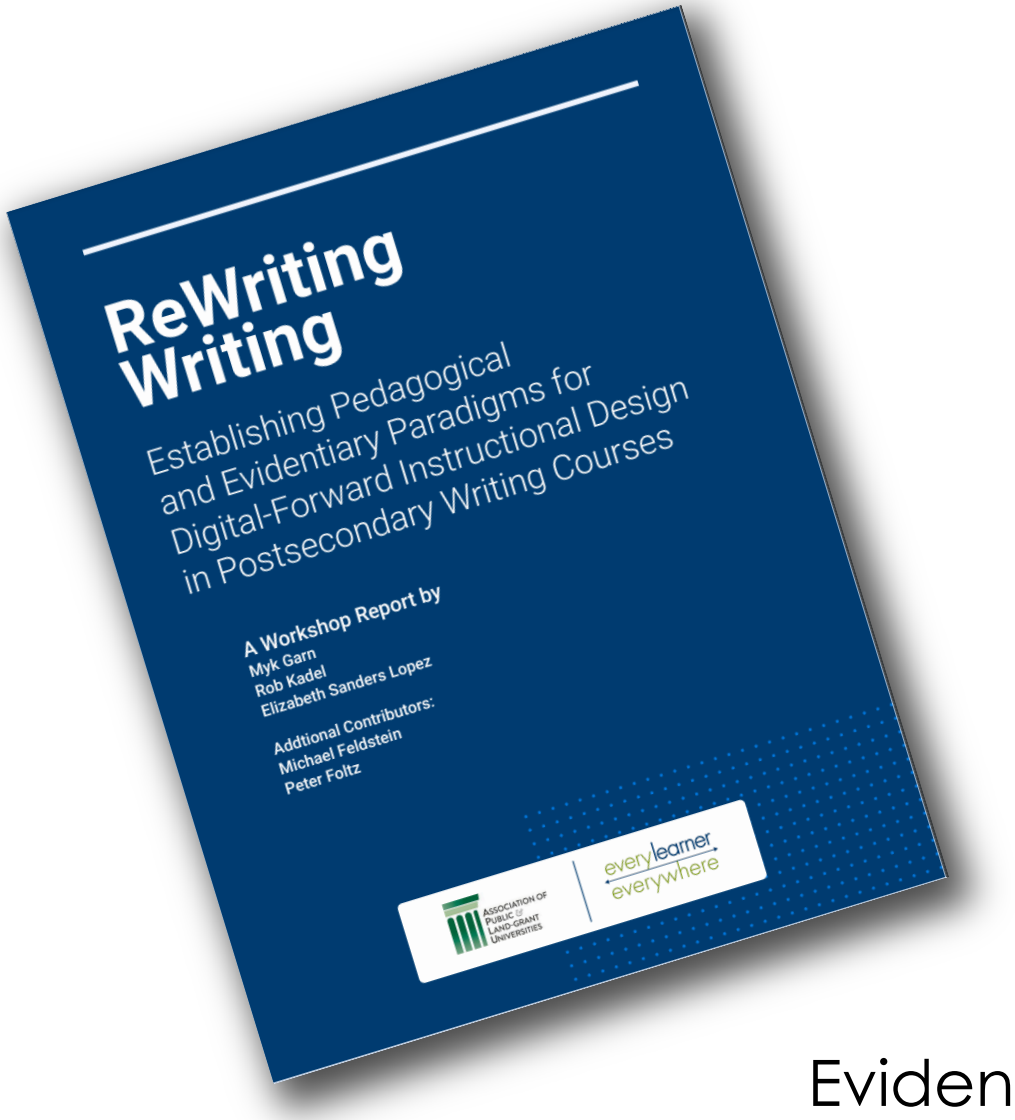
Does the Institution use time as an opportunity or is it a limitation?

Are there new roles for faculty and new roles emerging?

What new technologies and pedagogies are being used?

How does the institution capture, use data?
Does it make a difference?

Principles for Digital Forward Design



Equity

Engagement

Interaction

Instruction

Process and Practice

Feedback

Timeliness

Availability

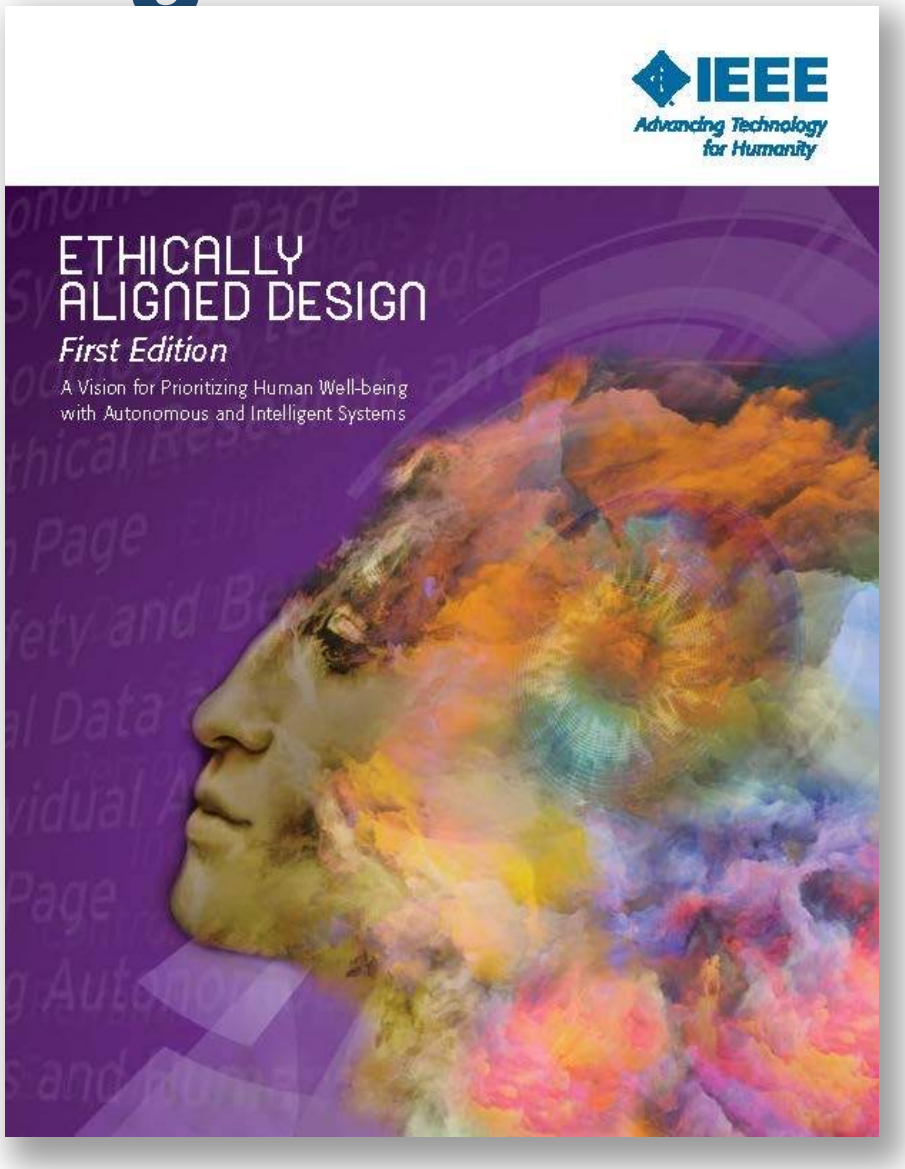
Tutoring and Remediation

Flexibility

Scalability

Evidence-based Decision Making

Considering Human Well-Being



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Individualization @ Scale

HYPOTHESES:

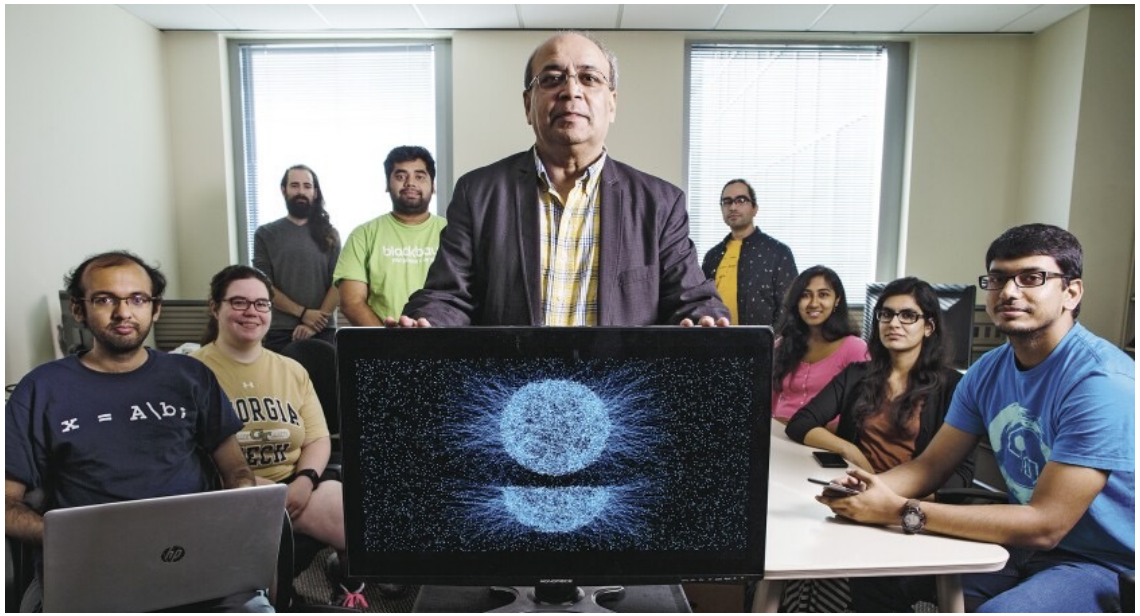
New Learning Models using AI can make assessing Quality of Digital Instruction more equitable, efficient, effective, and transparent.

Technology Changes the Time Equation – for the STUDENT

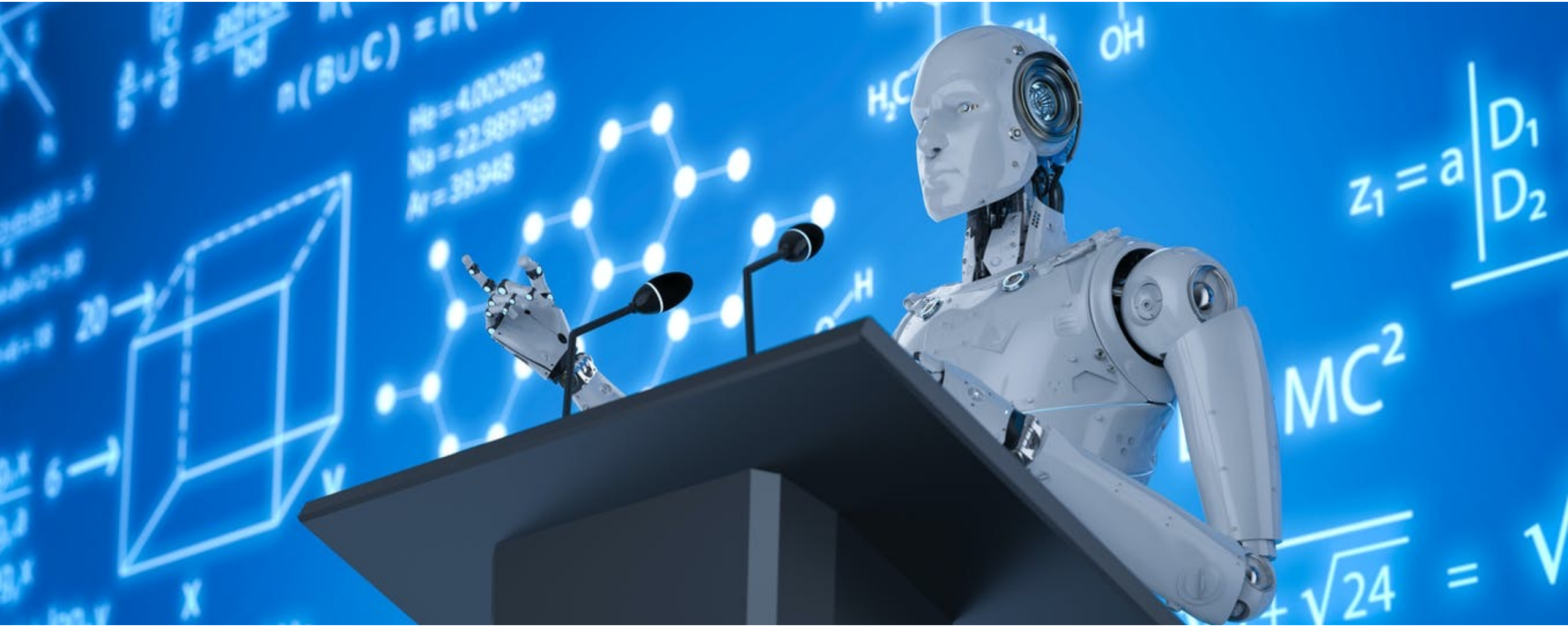
HYPOTHESES:

New Learning Models using AI can make assessing Quality of Digital Instruction more equitable, efficient, effective, and transparent.

Technology Changes the Time Equation – for the STUDENT and the PROFESSOR

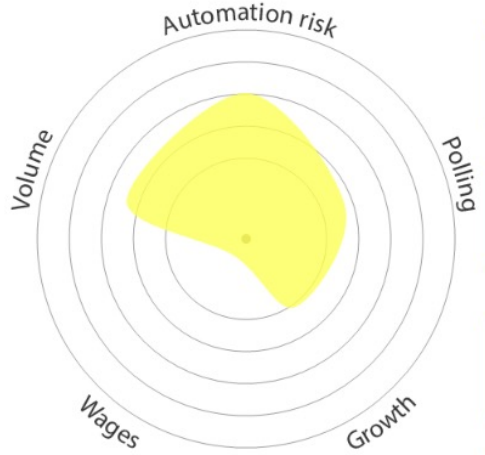


Will Robots Take Your Job?



Will Robots Take Your Job?

Teaching Assistants, Postsecondary



★4.4/10 job score ⓘ

AUTOMATION RISK
27%
risk level

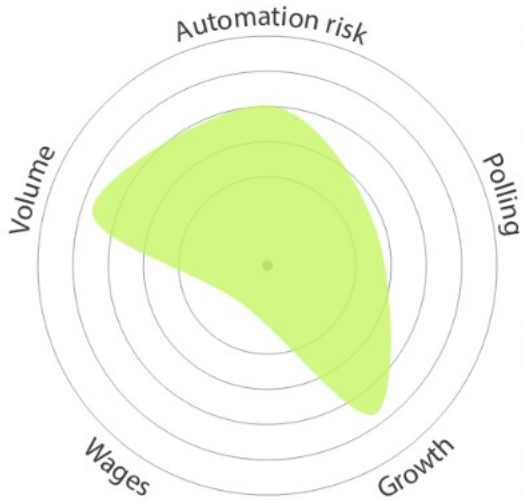
POLLING
There hasn't been enough votes on this occupation yet

GROWTH
6.4%
by 2030

WAGES
$36,250
or $17.43 hourly

VOLUME
138,740
as of 2020

Tutors



★5.8/10 job score ⓘ

AUTOMATION RISK
26%
risk level

POLLING
There hasn't been enough votes on this occupation yet

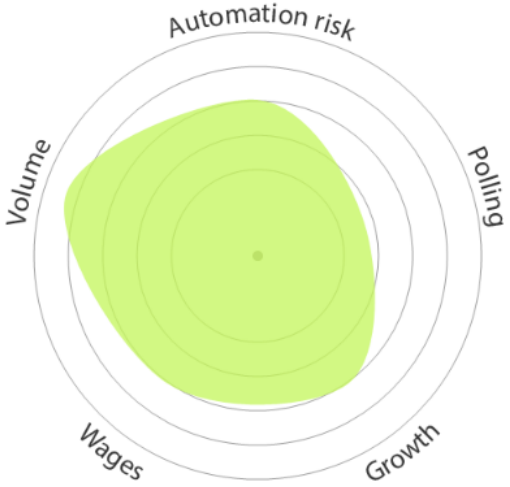
GROWTH
15.6%
by 2030

WAGES
$40,590
or $19.51 hourly

VOLUME
309,220
as of 2020

Will Robots Take Your Job?

Postsecondary Teachers



★6.7/10 job score ⓘ

AUTOMATION RISK
21%
risk level

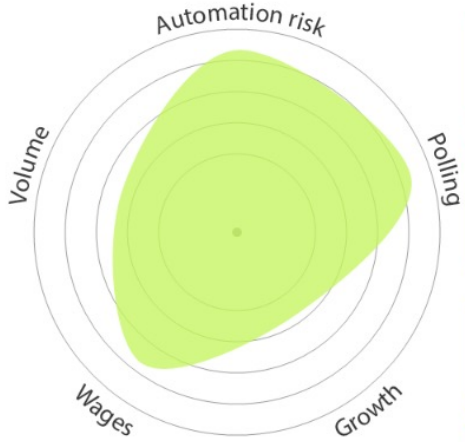
POLLING
There hasn't been enough votes on this occupation yet

GROWTH
10.7%
by 2030

WAGES
$76,990
or $37.01 hourly

VOLUME
1,369,930
as of 2020

Education Administrators, Postsecondary



★7.6/10 job score ⓘ

AUTOMATION RISK
5%
risk level

POLLING
27%
Based on 51 votes

GROWTH
7.5%
by 2030

WAGES
$97,500
or $46.87 hourly

VOLUME
140,880
as of 2020

https://willrobotstakemyjob.com/


WE'RE STILL HIRING
HUMANS
TO TEACH AT YOUR LOCAL COLLEGE
LAMAR

Myk Garn, PhD

Assistant Vice Chancellor for New Learning Models
University System of Georgia

myk.garn@usg.edu