



# How will AI transform education?

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and Sr. Academic Professional

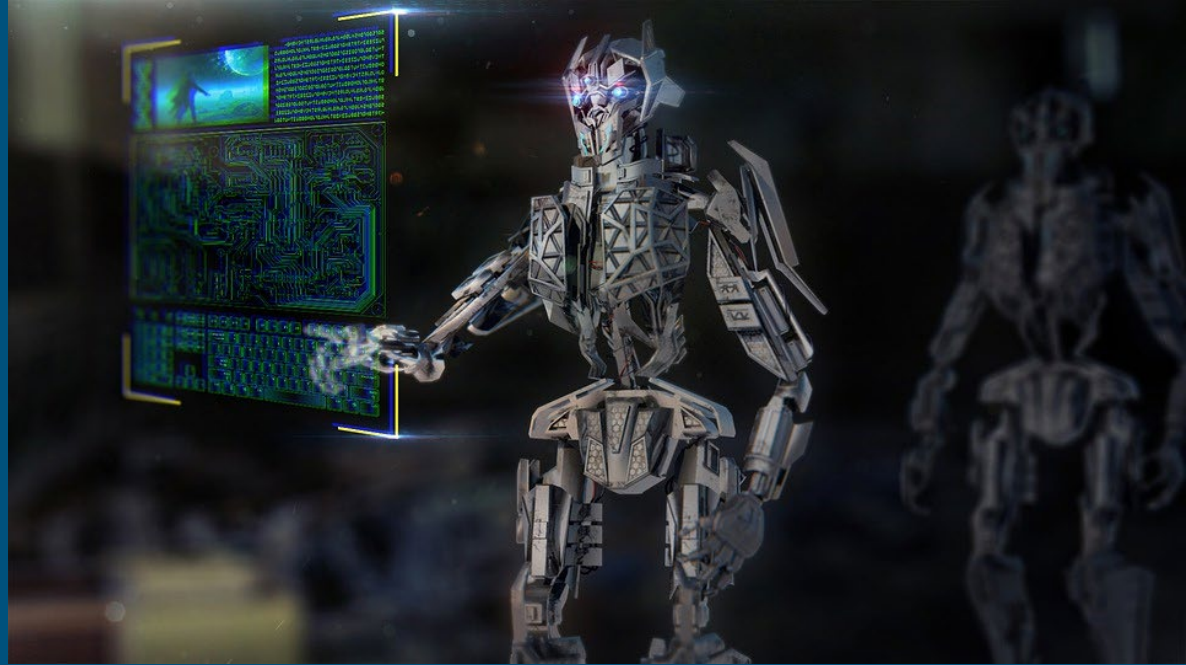
*Georgia Tech Professional Education*

# What is AI?

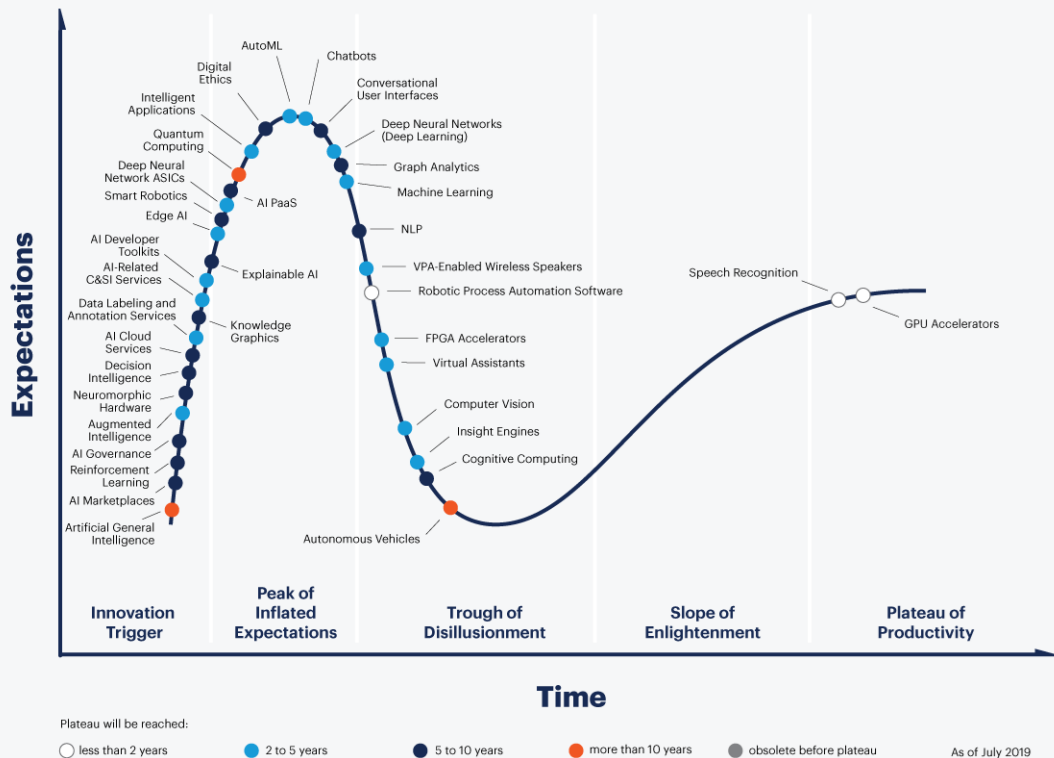
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The quest to build machines that can reason, learn, and act intelligently.

MIT Technology Review



# Gartner Hype Cycle for Artificial Intelligence, 2019



[gartner.com/SmarterWithGartner](https://gartner.com/SmarterWithGartner)

Source: Gartner  
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**Gartner**

# Framing the Issue



Our problems are  
problems of scale

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# Online as a response to scale

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- Modality not a solution
- ~50 degrees at scale



**INSIDE**  
HIGHER ED

A space for conversation and debate about learning and technology.

## The Conversation About Scaling High-Quality/Low-Cost Graduate Online Education

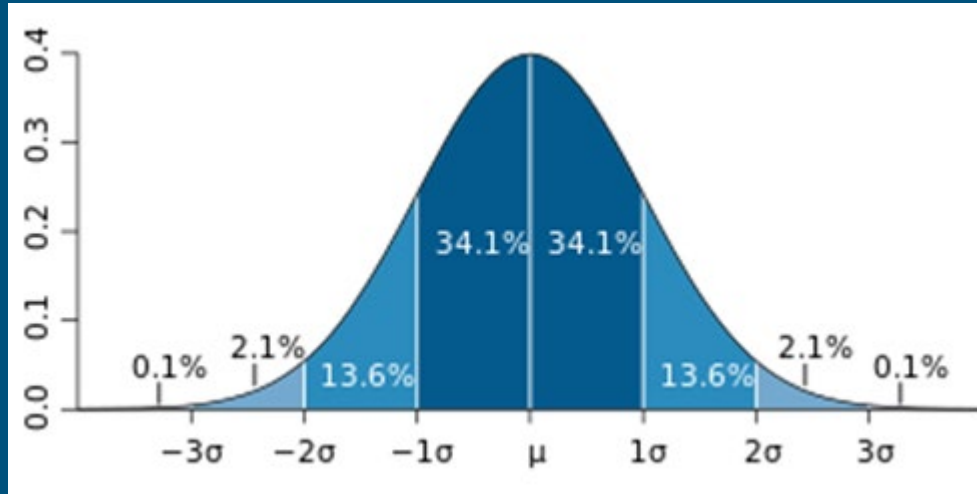
3 campus stakeholders.

By **Joshua Kim** // July 10, 2019



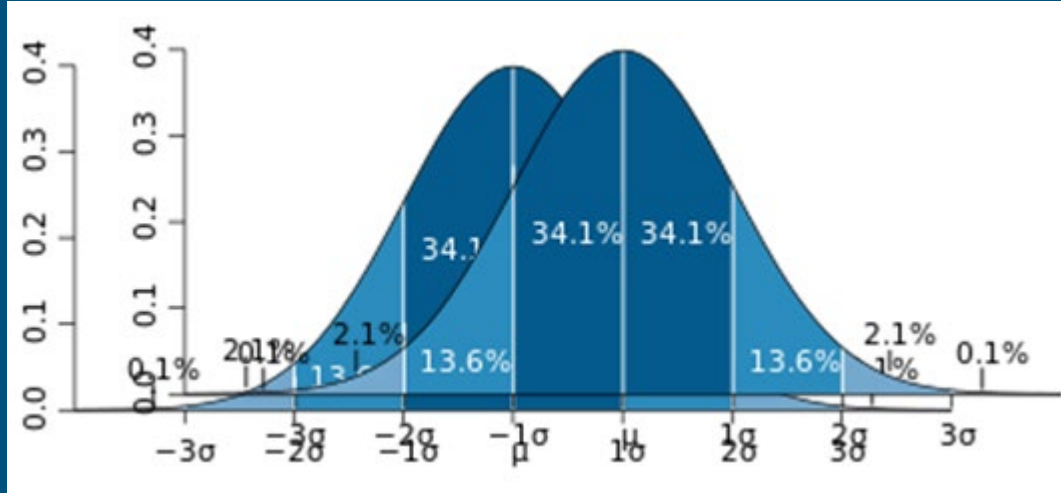
# First Day of Class

## Last Day of Class



# 2 Sigma Problem

## 1-1 Tutoring



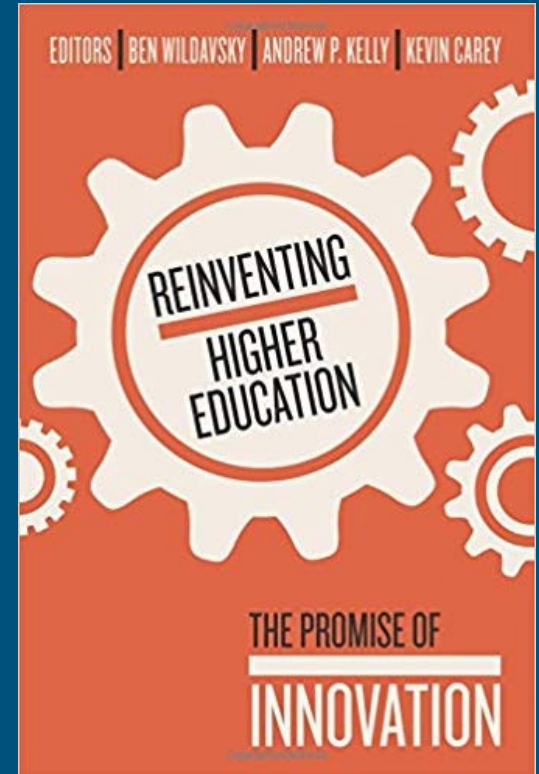
- Individualized instruction (pace)
- Immediate feedback
- Corrective action



# Status of Higher Education

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- 7 in high school grad start college
  - Only ½ graduate on time
- Only 7.3% single parents get a degree in 6 years
  - 46% drop out
- Students delaying college after high school:  
Only 13.7% with a degree
  - If working full time: 10.7%
  - No financial assistance from parents: 7.7%
- 38 million working age adults: some college, no degree



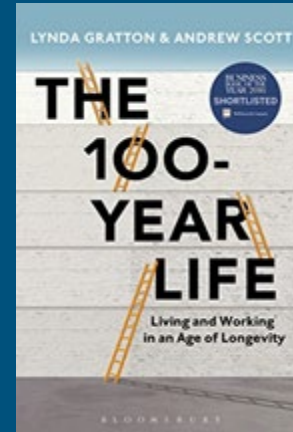
# Shifting Demographics & Work/Life

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By 2035, more Americans of retirement age than people below 18



Western children, 50% chance of living to be 105



# Automation | Artificial Intelligence

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**40%**

of Americans are in occupational categories that could shrink by 2030

**14.7**

million workers under age 34 could be displaced by automation

**4x**

higher risk of displacement for workers with high school diplomas or less

# Churn of Knowledge

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In 2015, \$160 Billion in the U.S and \$356 Billion globally spent in corporate education and training

HBR, 2018

39% of large company executives barely able or unable to find the talent they need

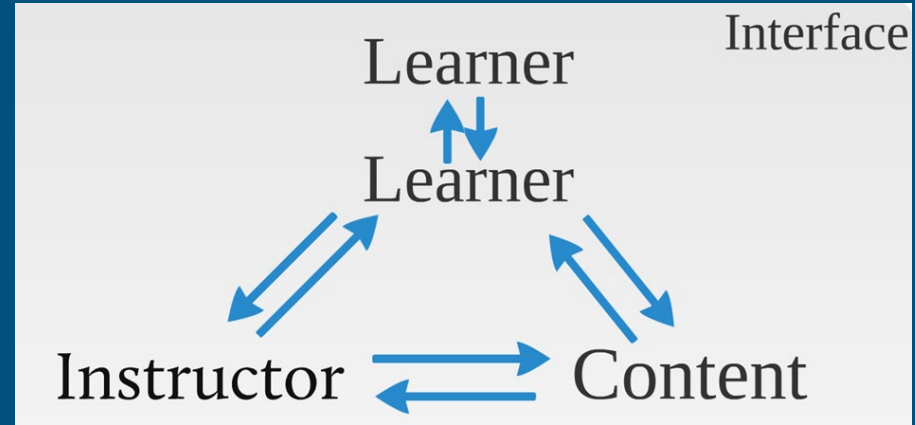
Deloitte survey

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Transforming Learning

# Personalized Learning

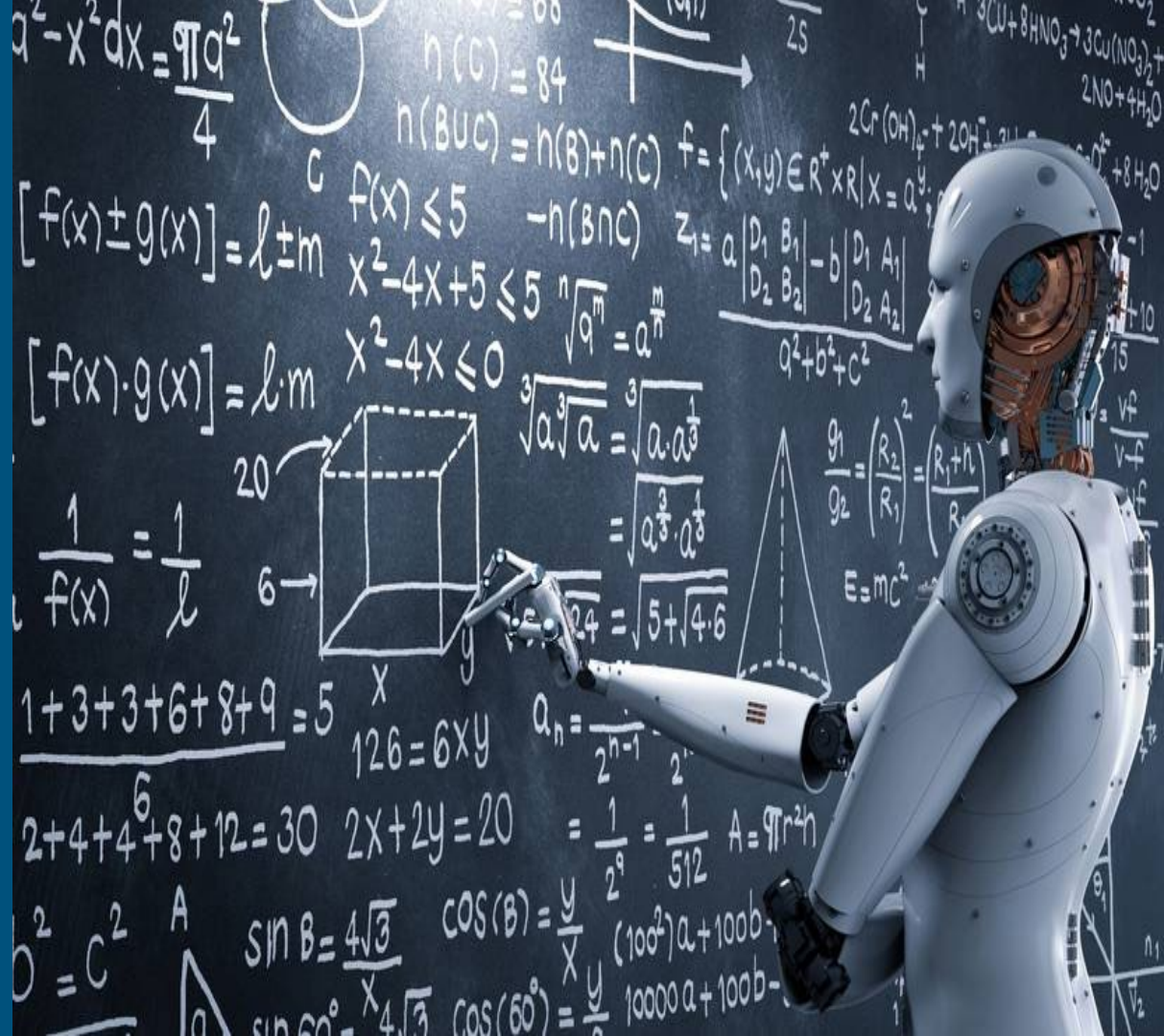
- Student-content interactions
  - Curriculum pathways
  - Pace of learning
  - Location of learning
- Student-student interactions
  - Asynchronous and just in time
- Student-faculty interactions
  - Asynchronous, whenever, wherever
  - Informed by student performance (learning analytics)
- Student-institution interactions
  - Alerts, nudges, advising to guide learning





# 4 D's of Robotization

- Dear
- Dangerous
- Dirty
- Dull

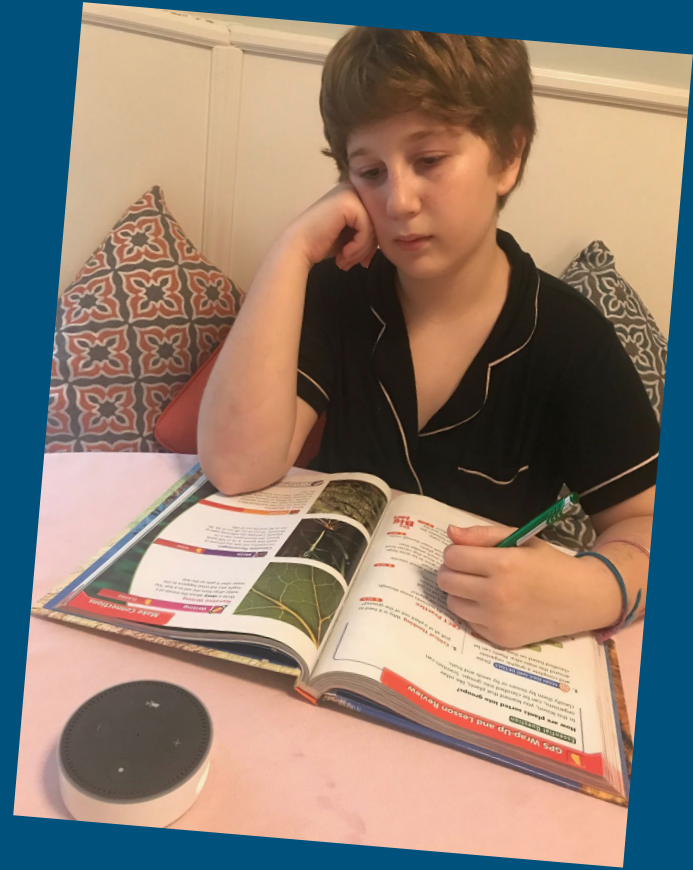


(Photo: Phonlamai Photo / Shutterstock)

# The Dull

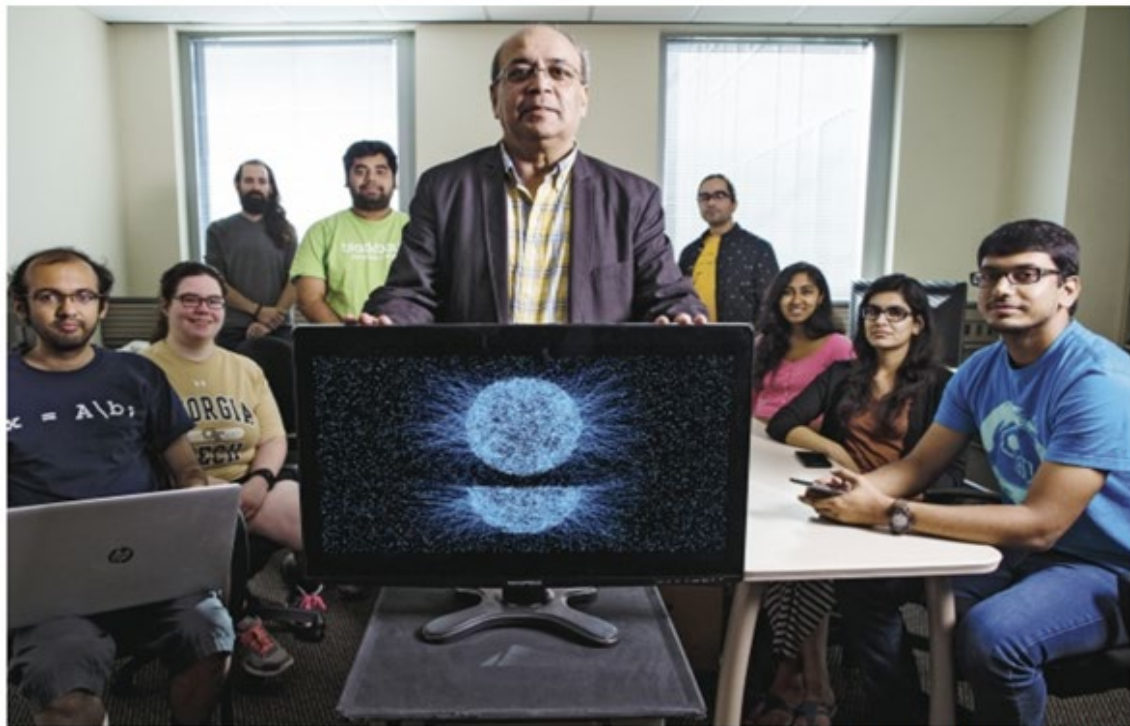
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- How long does the paper need to be? Can it be double-spaced?
- Is there an upper page limit to the paper?
- How do I submit the paper?
- Are we required to attend the online office hours?
- Can I get my degree plan approved?



# When the Teaching Assistant Is a Robot

Faculty members experiment with artificial intelligence in the classroom



Dustin Chambers for The Chronicle

Ashok Goel, a computer-science professor at Georgia Tech, is surrounded by his teaching assistants, including "Jill Watson" (on the screen), a question-answering software program.



Tech

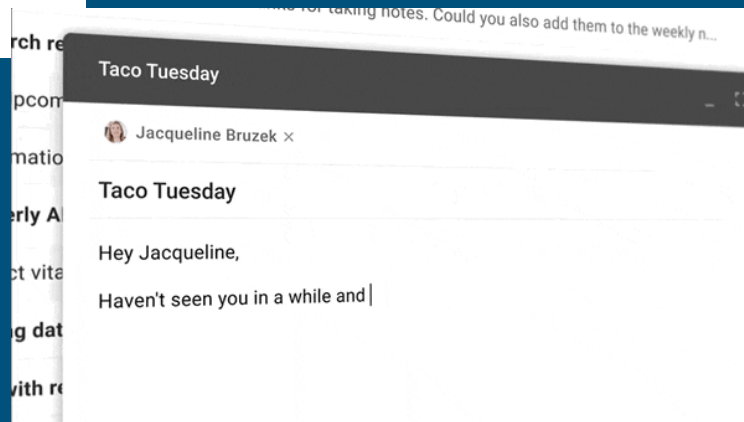
## Gmail can now autocomplete entire emails with a new feature called Smart Compose — here's how to turn it on

But the 'Smart Compose' feature seems to get better the more time you spend with it and is still in its early stages, so Google could tweak it in future



Business Insider

Published: 11:30am, 17 May, 2018



# Student Engagement

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## CASE STUDY

Georgia State University supports every student with personalized text messaging



**-21.4%**

Summer Melt



**+3.3%**

Enrolled at GSU

# 2

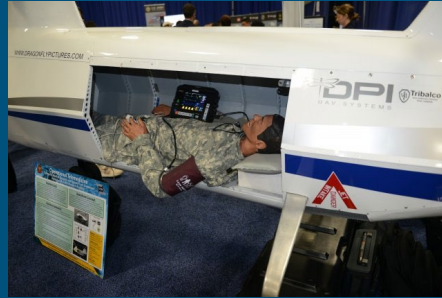
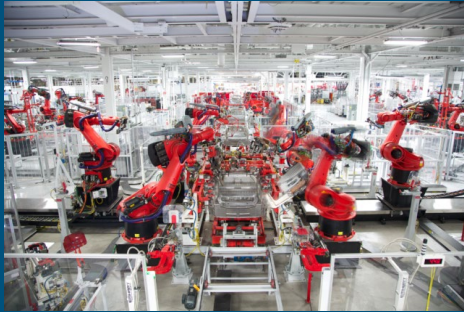
## Transforming Curriculum & Learning Spaces



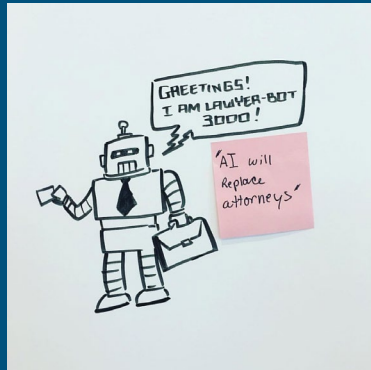
# Impact on Jobs

## Impact on Curriculum

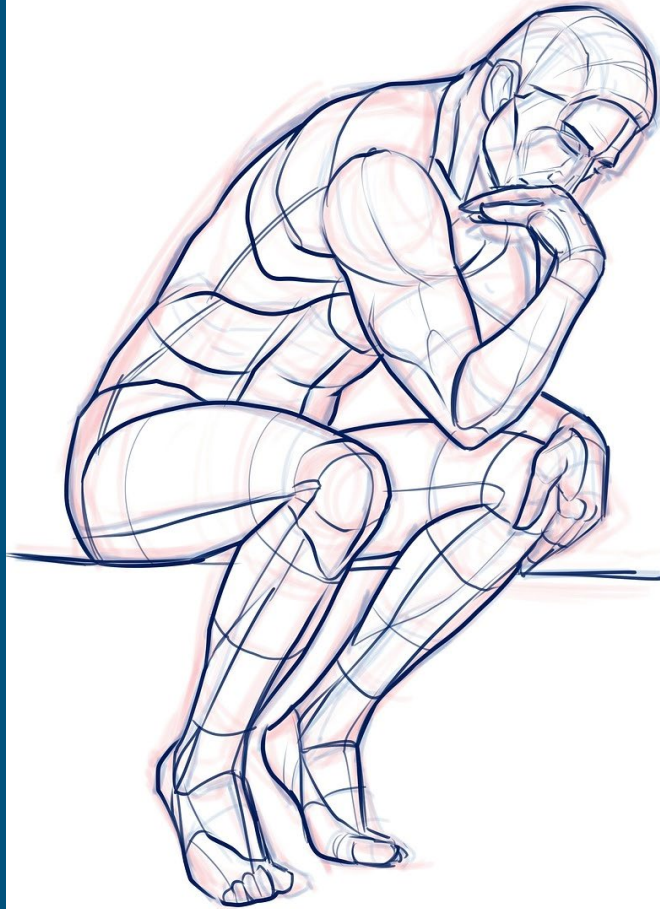
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- Truck drivers
- Customer service personnel
- Accountants
- Lawyers
- Doctors
- Teachers



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- Where courses need to improve
  - Natural language processing (scrubbing course forums)
  - Safe learning - extreme learning



- Creative thinking for solving non-routine problems
- Not what you know, but what you can do with what you know
- Soft skills - curiosity, critical thinking

*“Never again is someone going to pay you to answer a question that they can look up on Wikipedia. School is really for solving interesting problems.”*

*Seth Godin, Best-selling author, EDUCAUSE 2011*





**Academically**  
***adrift***

Limited Learning on College Campuses

Richard Arum and Josipa Roksa

45% undergraduates  
show no statistically  
significant gains in  
critical thinking, complex  
reasoning, written  
communications

2300 undergraduates in 24 institutions over 4 years



“Though the university community is a major force of innovation in our society, it is curiously resistant – even hostile – to innovations attempted within the university.”

Harold Enarson (1960). Innovation in Higher Education, *Journal of Higher Education*, 31, p. 495



# Teacher preparation

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- Create content
- Deliver content
- Facilitate and guide (advise) learning
- Assess learning



- Instill curiosity
- Inspire critical thinking
- Encourage flexibility
- Reinforce collaboration



# 3

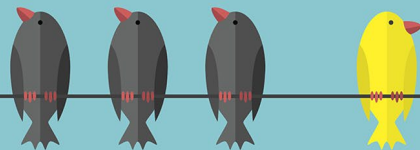
## Cultivating Ethics, Inclusion, & Social Justice

THIS IS YOUR MACHINE LEARNING SYSTEM?

YUP! YOU POUR THE DATA INTO THIS BIG PILE OF LINEAR ALGEBRA, THEN COLLECT THE ANSWERS ON THE OTHER SIDE.

WHAT IF THE ANSWERS ARE WRONG?

JUST STIR THE PILE UNTIL THEY START LOOKING RIGHT.



- 7% of users produce 50% of the posts on Facebook
- 4% of users produce 50% of the reviews on Amazon
- 0.04% of Wikipedia's registered editors (about 2000 people) produced the first version of half the entries of English Wikipedia





## Jill Watson Doesn't Care if You're Pregnant: Grounding AI Ethics in Empirical Studies

Jill Watson is our name for a virtual teaching assistant for a Georgia Tech course on artificial intelligence: Jill answers routine, frequently asked questions on the class discussion forum. In this paper, we outline some of the ethical issues that arose in the development and deployment of the virtual teaching assistant. We posit that experiments such as Jill Watson are critical for deeply understanding AI ethics.

# Diversification of Education & Workforce

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**19%**

Higher revenue due to  
innovation when  
management is diverse

- Distributed learning & work as an important tool of diversification
- AI depends on diversity of data

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Transforming Learning

2

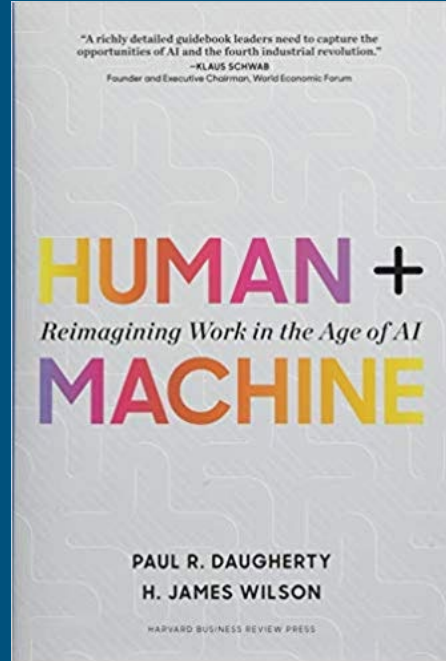
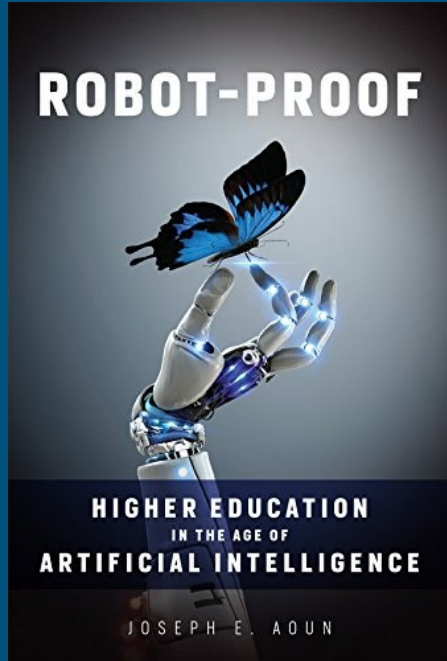
Transforming Curriculum &  
Learning Spaces

3

Cultivating Ethics,  
Inclusion, & Social Justice

# Our response?

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<http://popin.it/kmv34a>





# How will AI transform education?

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@yakutgazi



# Resources

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<https://elearningindustry.com/ai-is-changing-the-education-industry-5-ways>

<https://www.sciencedirect.com/science/article/pii/S1877050918315382>

<https://www.teachthought.com/the-future-of-learning/10-roles-for-artificial-intelligence-in-education/>

<https://www.brookings.edu/research/why-we-need-to-rethink-education-in-the-artificial-intelligence-age/>

<https://towardsdatascience.com/survey-d4f168791e57>

<https://www.forbes.com/sites/cognitiveworld/2019/07/12/ai-applications-in-education/#6d6714d762a3>

[https://www.admithub.com/case\\_study/how-georgia-state-university-supports-every-student-with-personalized-text-messaging/](https://www.admithub.com/case_study/how-georgia-state-university-supports-every-student-with-personalized-text-messaging/)

<https://www.insidehighered.com/digital-learning/views/2019/01/16/its-higher-education-keep-ai-check-opinion>