

The Future of Learning

What's Next?

Michael Kolodziej, EdD.





“If we teach today’s students
as we taught yesterdays we
rob them of tomorrow.”
-John Dewey

OVERVIEW:

What's NEW?

What does the research say?

What does GOOD/BAD learning look like?

Is technology the savior?

Change is hard, but worth it.



Instructional
DesignNerd



- Father of two
- Former Science Teacher, La Jolla High School (Physics and Biology)
- Instructional Designer
- Learning Technologist
- Online Faculty Member (Logic, Business Comm)
- Leader in Learning Design and Innovation
- Corporate Learning Strategist

I'm a LEARNING NERD. Let's be friends.

Michael Kolodziej, EdD
Instructional DesigNerd



<https://twitter.com/mskolodz>



<https://www.linkedin.com/in/mikekolodziej/>



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DesigNerd**

NINTH GRADE		TENTH GRADE		ELEVENTH GRADE		TWELFTH GRADE		SUMMER SCHOOL	
Kolodziej Michael S	Kolodziej Michael S	Kolodziej Michael S	Kolodziej Michael S	Kolodziej Michael S	Kolodziej Michael S	Kolodziej Michael S	Kolodziej Michael S	Kolodziej Michael S	Kolodziej Michael S
P COM 1	P LIT 1	P COM 2	P LIT 2	P AM LIT 1	P CERARCS1	P DRU/PNT1	P DEV ARTS1	P DEV ARTS1	P DEV ARTS1
P JRNLSM 1	P FWRK CFP	P SPAN 1	P ELCTRNC1	P SPAN 2	P PSYCH 1	P GEOMTRY1	P HST APFN	P HST APFN	P HST APFN
P HLTH SCI	P FWRK CFP	P ALGEBRA1	P BIOLALBS	P ALGEBRA1	P OCEANOG1	P CIVICS	P ADV WRST	P ADV WRST	P ADV WRST
P PRE ALG1	P FWRK CFP	P BIOLOG1	P BIOLALBS	P OCEANOG1	P US HIST1				
P BASCCT1	P FWRK CFP	P UBLDHIST1	P UBLDHIST1	P US HIST1					
P RSHHNP1	P FWRK CFP	P UTS/FTBL	P ADV WRST	P ADV WRST					
S-CPA 1.80	S-CRED 30.00	S-CPA 2.00	S-CRED 30.00	S-CPA 2.00	S-CRED 30.00	S-CPA 2.00	S-CRED 30.00	S-CPA 2.00	S-CRED 30.00
A-CPA 1.80	A-CRED 30.00	A-CPA 1.95	A-CRED 30.00	A-CPA 2.19	A-CRED 165.00	A-CPA 2.18	A-CRED 235.00	A-CPA 2.18	A-CRED 235.00
9 MT. CARMEL SEM R 90-91		10 MT. CARMEL SEM R 91-92		11 MT. CARMEL SEM R 92-93		12 MT. CARMEL SEM R 93-94		12 MT. CARMEL SEM R 93-94	

STUDENT RECORD CARD	
ABRAKAS HIGH SCHOOL	<input type="checkbox"/>
1088 Granada Road	
Hayward, CA 94542-3009	
Off-Campus Independent Study	<input type="checkbox"/>
MT. CARMEL HIGH SCHOOL	<input type="checkbox"/>
6500 Camino del Mar	
San Diego, CA 92129-2708	
POWAY HIGH SCHOOL	<input type="checkbox"/>
10000 Poway Road	
Poway, CA 92064-2099	
RANCHO BERNARDO HIGH SCHOOL	<input type="checkbox"/>
13000 Bernardo Center	
San Diego, CA 92128-2099	
ENTRY/WITHDRAWAL	
DATE	REASON
5/10/90	Need Withdraw
DATE	REASON
6-16-94	235
218	425,509
GRADUATION DATA	
DATE	SCORE
6-16-94	235
218	425,509
BASIC SKILLS ASSESSMENT	
Mastery Dates	
Reading	
Writing	3/42
Math	3/42
PLACE OF BIRTH	
CA	
BIRTHDATE	SEX
7-24-76	M <input type="checkbox"/> F <input type="checkbox"/>
PARENT/GUARDIAN	
Michael/Patsy Flanagan	
IMMUNIZATION DATES	
Polio	7/27/94
DPT	8/23/94
Meningitis	
Tetanus	
Varicella	11/12/97



Pepperdine University 2017

What's New??

**Everything, and
nothing.**



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The COVID-19 pandemic has changed education forever. This is how



With schools shut across the world, millions of children have had to adapt to new types of learning.

Image: REUTERS/Gonzalo Fuentes

EDUCATION PLUS DEVELOPMENT

The COVID-19 cost of school closures

George Psacharopoulos, Harry Patrinos, Victoria Collis, and Emilliana Vegas
Wednesday, April 29, 2020

EDUCATION PLUS DEVELOPMENT



Editor's Note: Mass school and university closures have been among the most shocking signs of COVID-19's power to drive a global shutdown. This blog begins the discussion on quantifying the long-term impact of lost earnings on young people and the future global economy of this unprecedented, near universal, policy response.

In mid-April, [UNESCO](#) reported 192 countries had closed all schools and universities, affecting more than 90 percent of the world's learners: almost 1.6 billion children and young people. While some governments are starting to order teachers and students back to work, education—one of the most important drivers in human capital investment—continues to be largely closed for business.

Things that seemed impossible just a few years ago, are NOW A REALITY.



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Zoom Tributes



Drive Thru Graduations



Things that seemed impossible just months ago, are NOW A REALITY.



How much has school REALLY changed?



Before



After

What Does the Research Say?



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2015 College Grads May Not Be As Ready for the Workplace as They Think They Are

Kaitlin Mulhere @KMulhere | May 14, 2015



College students have rosy views about their chances of finding a job they like and performing well at it, but recent graduates tell a different story.

College students planning to graduate in 2015 are overwhelmingly confident in their career preparations and chances of getting hired.

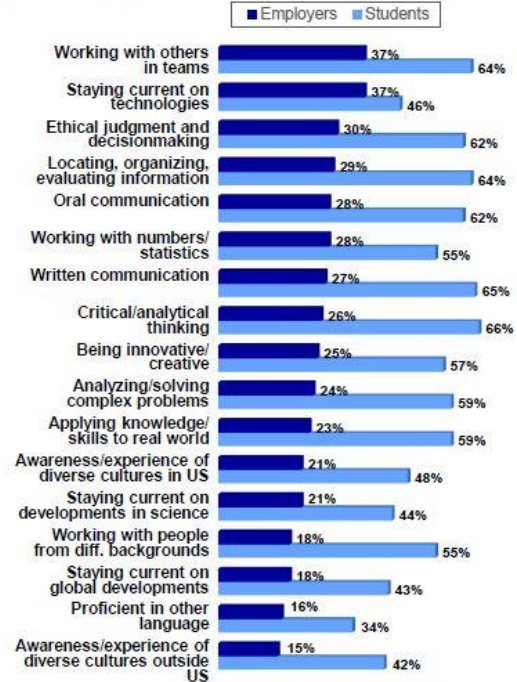
Maybe it's harsh to rain on their parade so shortly after they've tossed their graduation caps in the air, but surveys show new college graduates are probably



Jonathan Fernstrom—Getty Images

Employers give college graduates low scores for preparedness across learning outcomes; students think they are better prepared.

Proportions saying they/recent college graduates are well prepared in each area*



*8-10 ratings on zero-to-ten



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Is Blended Learning worth it??

“In recent experimental and quasi-experimental studies contrasting blends of online and face-to-face instruction with conventional face-to-face classes, blended instruction has been more effective, providing a rationale for the effort required to design and implement blended approaches.

When used by itself, online learning appears to be as effective as conventional classroom instruction, but not more so.”

<https://www2.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdf>

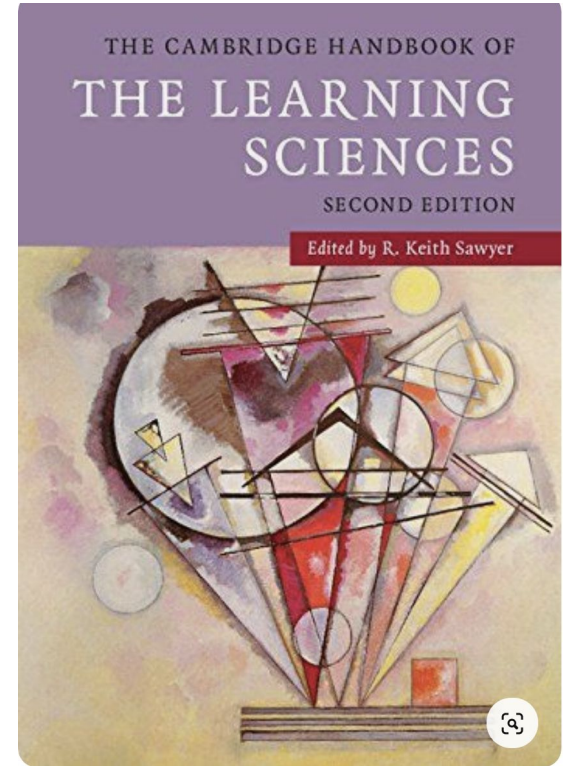


Researchers in The Learning Sciences are “dedicated to the interdisciplinary empirical investigation of learning as it exists in real-world settings and to how learning may be facilitated both with and without technology.”

<https://www.isls.org/>



**International Society of
the Learning Sciences**

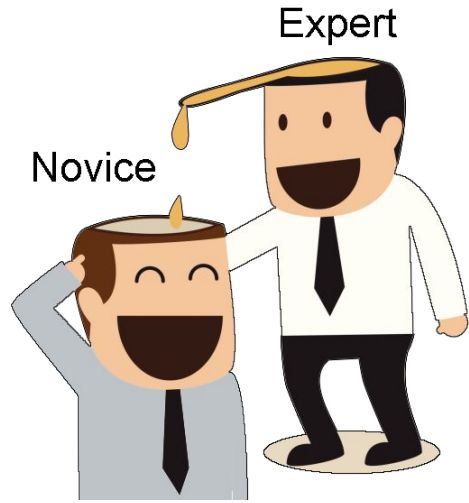


What does GOOD/BAD learning look like?



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EPISTEMOLOGY MATTERS

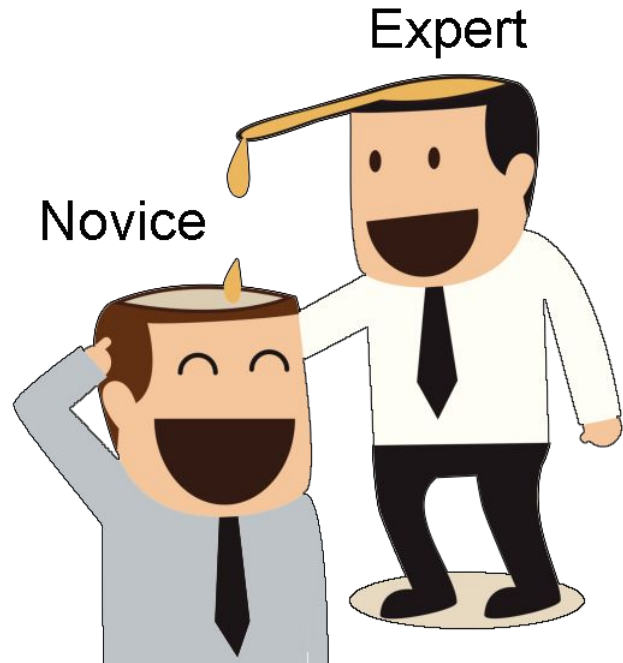


Learning as Knowledge Transfer



Learning as Knowledge Construction

EPISTEMOLOGY OF COGNITIVE THEORY



Learning as Knowledge Transfer

Assumptions of Cognitivism:

- Knowledge is fixed and discoverable.
- Knowledge passes from the expert to the novice.
- Distractions should be minimized to better focus on the source of the knowledge.



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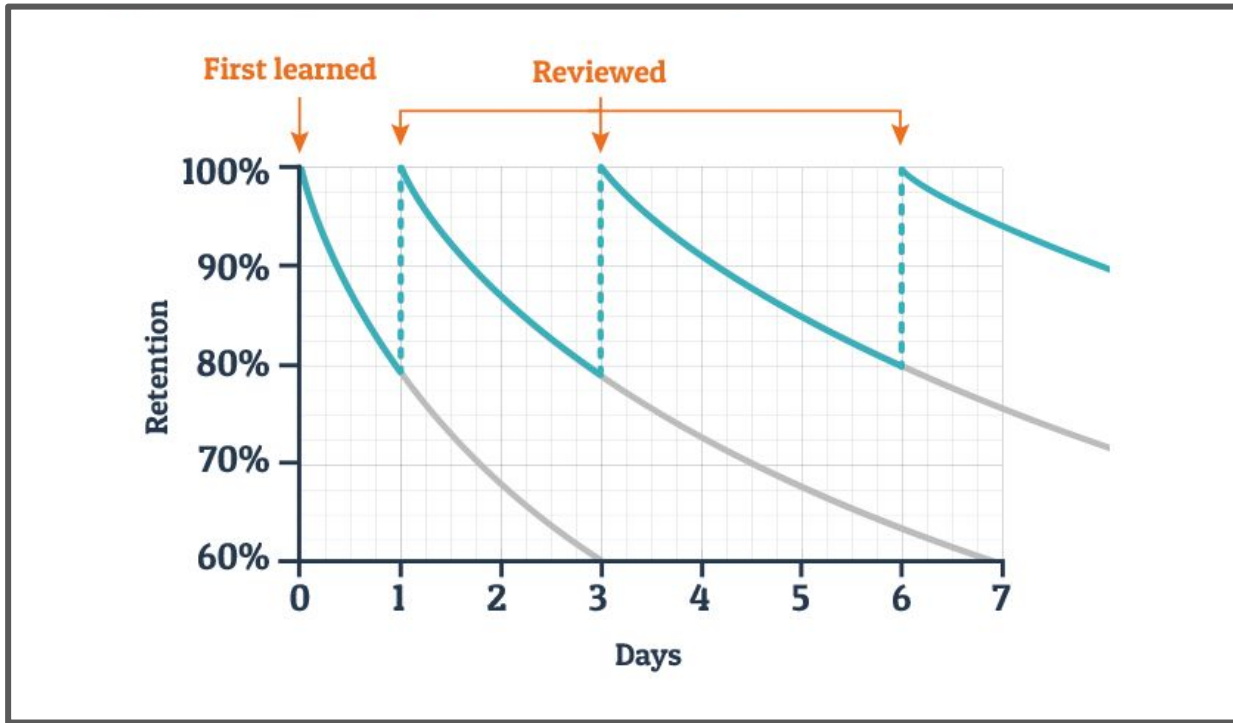
What's better than TELLING PEOPLE EXACTLY WHAT THEY NEED TO KNOW?



But while you are succinctly laying out the TRUTH, people are listening, thinking and if you're lucky TRYING to make what you are saying in some way relatable to their existing understanding or schema.



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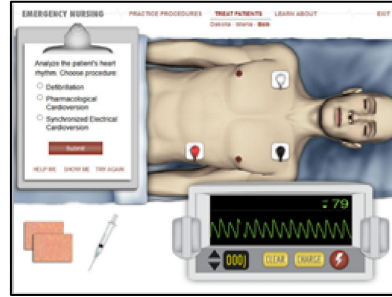
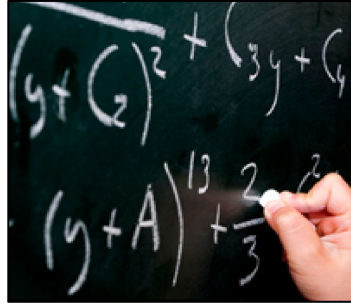
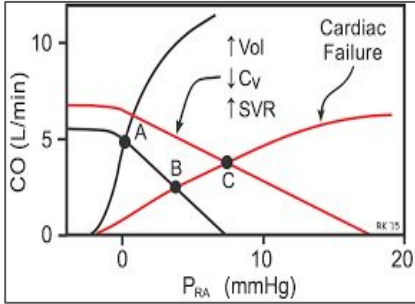


Ebbinghaus Forgetting Curve



Not all learning is the same

Emphasizing Authentic and Situated Activity



Better

Abstract

Recalling facts
Describing terms and concepts
Identifying relationships

Applied

Problem solving
Rote practice
Variables and solutions

Situated

Scenarios
Simulations
Solving problems in context

Authentic

Work on a real-world problem
Practice in **actual domain**
Create an authentic artifact



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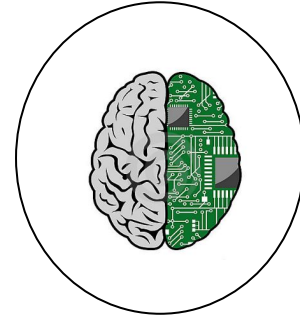
Leveraging Technology for Learning



SITUATED &
AUTHENTIC LEARNING
EXPERIENCES



LEARNING THROUGH
BUILDING AND PLAY



ADAPTIVE
LEARNING AND
TECHNOLOGIES



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Leveraging Technology for Learning



SITUATED &
AUTHENTIC LEARNING
EXPERIENCES

Leah (17)

Interests: Cats, Soccer,
Photography

Disinterests: Non-Cats



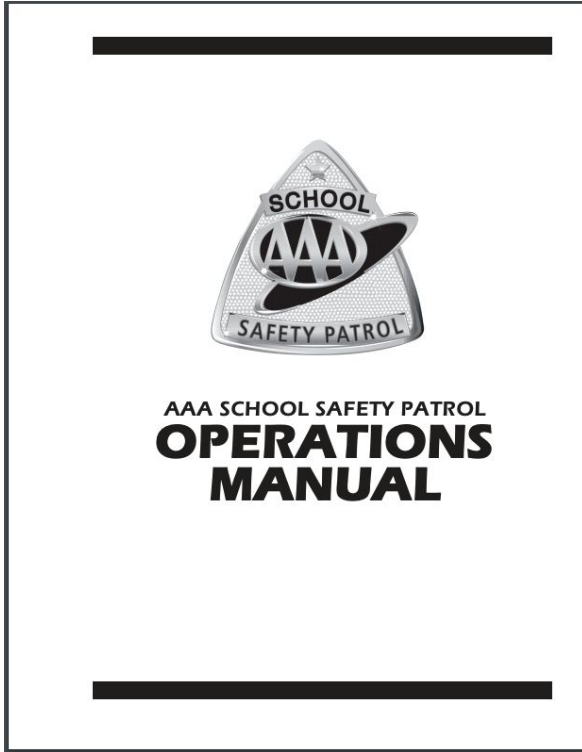
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Safety Patrol



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Role of Patrol at Signalized Intersections

Only police officers or adult crossing guards can stop vehicles. Patrol members have specific duties based on their posts.

Duties of patrol members:

- Stand on the sidewalk, at least one step back from the curb and midway between crosswalk lines
- Watch traffic flow and children approaching
- At red lights, signal students not to enter the intersection by holding arms down at 45-degree angle to the body
- At green lights, determine all approaching traffic has stopped before allowing students to cross
- Check traffic in all directions for a suitable gap and then permit children to cross
- Before the light changes back to red, return to the outstretched arms position to prevent children from being caught in the middle of the intersection

Safety Patrol



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“In theory, theory and practice are the same. In practice, they are not.” -unknown

Context Matters





The central issue in learning is **becoming a practitioner** not learning about practice.
(Brown & Duguid, 1991)

Legitimate Peripheral Participation



XR Extended Reality

TERM

Simulation

AR
Augmented
Reality

MR
Mixed
Reality

VR
Virtual
Reality

EXPERIENCE



TECHNOLOGY



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A Walk Through Dementia

<https://www.awalkthroughdementia.org/>

Presented in virtual reality, you'll look at everyday life through a new lens. You may be familiar with some of the symptoms you'll experience, others may surprise you.

This app was developed by Alzheimer's Research UK, guided by people living with different forms of dementia. They were all keen to help you understand what everyday life can be like for them.

VR for Immersive Learning



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Leveraging Technology for Learning



SITUATED &
AUTHENTIC LEARNING
EXPERIENCES



LEARNING THROUGH
BUILDING AND PLAY

“Every maker of video games knows something that the makers of curriculum don't seem to understand. You'll never see a video game being advertised as being easy. Kids who do not like school will tell you it's not because it's too hard. **It's because it's—boring”**



-Seymour Papert Founder of Constructionism



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Jacob (19)

Interests: Anything with a screen,
Games, Money

Disinterests: School

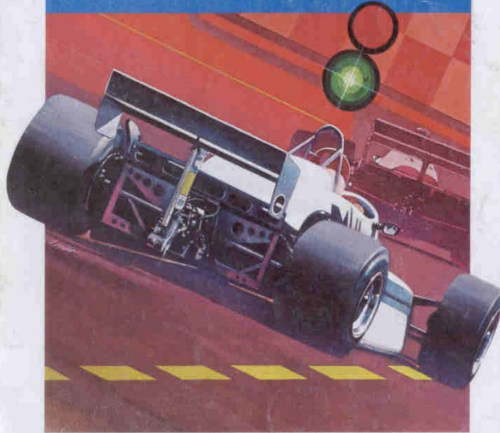


VIDEO GAME CARTRIDGE
FOR THE ATARI 5200 SUPERSYSTEM.

ATARI 5200™

THIS YEAR'S ARCADE HIT WITH REAL MOTION GRAPHICS

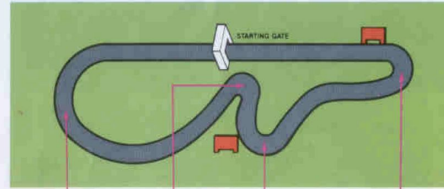
POLE POSITION



*POLE POSITION is engineered and designed by Namco Ltd. manufactured under license by Atari, Inc. Trademark and © Namco 1982.

3. GAME PLAY

QUALIFYING LAP. The Qualifying Lap is one complete circuit of the race course:



Final Corner Hairpin Turn 0.1 Km Radius Turn First Corner

Your starting position and Position Bonus appear in the center of the screen at the end of the Qualifying Lap when you qualify for the big race.



A lap time of 73 seconds (73"00) qualifies you for eighth place in the starting lineup and earns you 200 bonus points. To win the

Pole Position and 4000 bonus points, you must do the lap in 58½ seconds (58"50) or less. See Section 7, SCORING, for other Position Bonuses.

THE RACE. Four starting lights blink the countdown. Shift into low gear on the red lights and move out fast on the green. Shift into high gear when you're up to speed. See Section 5, USING THE CONTROLLER, for car controls.

Complete the first lap in 75 seconds or less to earn Extended Play time and go on racing. Each time you beat the Race Timer, you earn more racing time until you're on the final lap. A race can have as many as eight laps (see Section 4, OPTIONS). The lap you're on

3



and your lap time appear at the top right of the screen.

PASSING BONUS. Your passing bonus (50 points per car) appears in the center of the screen at the end of the race, or at the end of the Qualifying Lap if you fail to qualify for the race:

PASSING BONUS 50 x 28

THE FINISH. Victory is at hand when crossed checkered flags flash on your screen, but you're not a winner until you cross the finish line.



TIME BONUS. If seconds remain on the Race Timer at the end of the race, you earn a time bonus of 200 points per second. The time bonus appears in the center of the screen and is followed by your total lap time for the race:

TIME BONUS 200 x 10

TOTAL TIME 112"45

4

LEARNING TO PLAY THE GAME



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TOP 15910
SCORE 15910

TIME 119

LAP 53"17
SPEED 176km



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Contextual Guided Practice



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FORZA GAMES COMMUNITY REWARDS STORE FORZA RC SUPPORT Sign In

Forums

ALL FORUMS FORZA HORIZON 4 FORZA MOTORSPORT 7 FORZA HORIZON 3 ACTIVE TOPICS

Trending Now:
Forza Horizon 4 Series 12 Update
[View News](#)

COLLAPSE ALL EXPAND ALL

	NEWS & EVENTS	LAST POST	TOPICS	POSTS
News Discussion	Forza Research SQC to be rebranded to Forza Horizon 4 Series 12 Update	Forza Research SQC to be rebranded to Forza Horizon 4 Series 12 Update 24 Oct 2019	396	13,853
Community Events	Forza Research SQC to be rebranded to Forza Horizon 4 Series 12 Update	Forza Research SQC to be rebranded to Forza Horizon 4 Series 12 Update 24 Oct 2019	878	21,375
Content Creator's Area	Forza Research SQC to be rebranded to Forza Horizon 4 Series 12 Update	Forza Research SQC to be rebranded to Forza Horizon 4 Series 12 Update 24 Oct 2019	410	1,370



XBOX ONE

XBOX ONE EXCLUSIVE

FORZA MOTORSPORT 7

EVERYONE
E
ESRB

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FORZA GAMES COMMUNITY REWARDS STORE FORZA RC SUPPORT Sign In

NEWS
FORUMS
GALLERY

FORZA MOTORSPORT 7

Forza Motorsport 7 | August 2019 Update

<https://forza.horizondrivers.com>

LEARNING TO PLAY THE GAME





Sharing of knowledge in context
Direct Interaction with Expert
Questions, Attitudes and
Strategies.

Cognitive Apprenticeship through Twitch



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Stop Telling Learners and let them Play.

“If one were to peruse the user manual for most popular video games, he would be quickly overwhelmed by the seemingly impenetrable technical terms and contextualized grammars.

In fact, until one actually plays the game, the manual is arguably meaningless and certainly not engaging in itself. However, once one plays the game, the previously cryptic rule sets and referenced dynamics become intelligible; even more importantly, the manual becomes a resource or tool for maximizing game play performance.

In schools, however, children are handed the “manual” but not shown the “game”; in fact, in the context of schools, engaging the actual “game” is considered an enrichment activity while the “manual” remains the true object of teaching and target of testing” -Sasha Barab

LEARNING TO PLAY THE GAME



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Gamification?



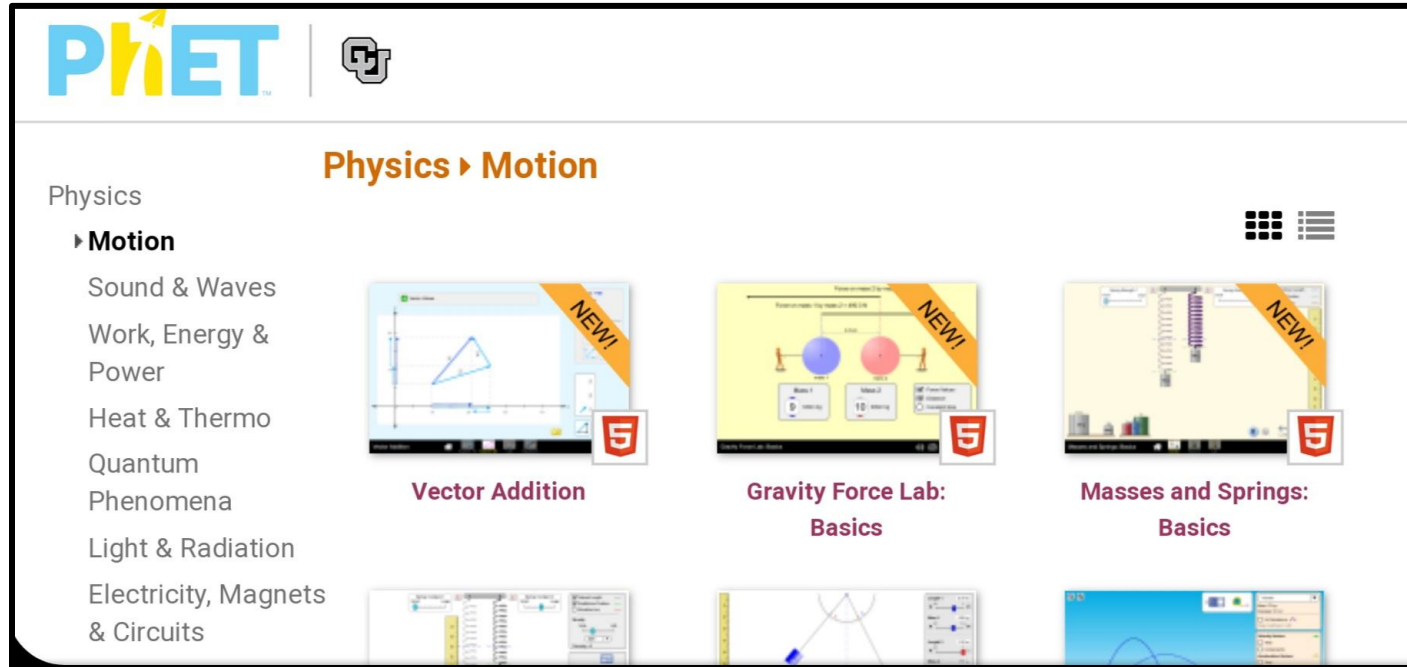
- Badges
- Points
- Visual rewards
- Structured paths





Gameful Learning

Simulations to learn relationships



The screenshot shows the PhET website interface. At the top left is the PhET logo and the CU Boulder logo. The main heading is "Physics ▶ Motion". On the left is a navigation menu with categories: Motion, Sound & Waves, Work, Energy & Power, Heat & Thermo, Quantum Phenomena, Light & Radiation, and Electricity, Magnets & Circuits. The "Motion" category is selected. Three simulation thumbnails are displayed in a row, each with a "NEW!" banner and a red "5" icon. The first is "Vector Addition", the second is "Gravity Force Lab: Basics", and the third is "Masses and Springs: Basics". A grid icon is visible in the top right corner of the simulation area.

Physics

▶ **Motion**

- Sound & Waves
- Work, Energy & Power
- Heat & Thermo
- Quantum Phenomena
- Light & Radiation
- Electricity, Magnets & Circuits

Vector Addition

Gravity Force Lab: Basics

Masses and Springs: Basics

<https://phet.colorado.edu/en/simulations/category/physics/motion>

Let Learners Build Schema through Experience



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Constructionism “shares Constructivism’s connotation of learning as ‘building knowledge structures’ irrespective of the circumstances of the learning.” But adds the critical component, that this “happens especially felicitously in a context where the learner is consciously engaged in constructing a public entity” (Papert and Harel, 1991, pg. 12)

-Seymour Papert

Founder of Constructionism



Make THINGS THAT MATTER!



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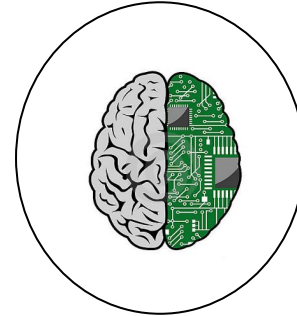
Leveraging Technology for Learning



SITUATED &
AUTHENTIC LEARNING
EXPERIENCES



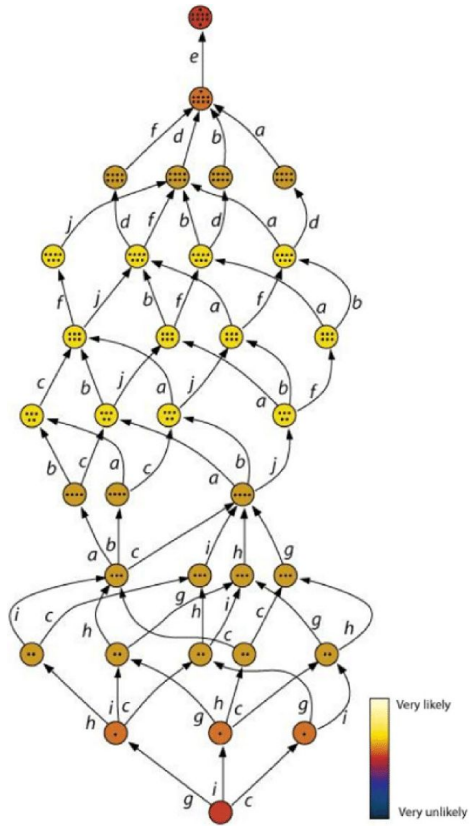
LEARNING THROUGH
BUILDING AND PLAY



AI & ADAPTIVE
LEARNING



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Intelligent Tutoring Systems are

“highly adaptive, interactive, and learner-paced learning environments created using computational models developed in the learning sciences, cognitive sciences, mathematics, computational linguistics, artificial intelligence, and other relevant fields”

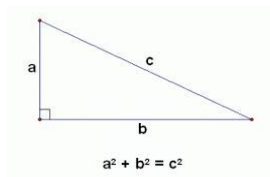
(Steenbergen-Hu and Cooper 2014, p.331),

Intelligent Tutoring Systems



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What are you struggling with?
Let's review together...

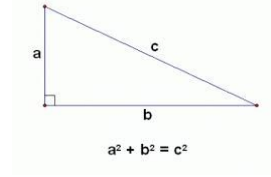


Side b is twice as long as side a. Side a is = 2.

What is the length of side c?

Simple Feedback

CORRECT!
TRY AGAIN.

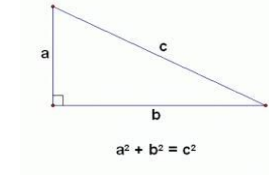


Side b is twice as long as side a. Side a is = 2.

What is the length of side b?

What is the equation used to solve for c?

What is the length of side c?



Side b is twice as long as side a. Side a is = 2.

What is the length of side c?

Are you familiar with Pythagorean Theorem?

Yes- Use it here
No- Let's explore- Review

Human tutoring
.79

(+) Effect Size

Answer-based tutoring
.31

Characterized by giving students immediate feedback and hints on their answers. (VanLehn, 2011).

Step-based tutoring
.75

Users enter the steps that they would do when solving problems normally, without the tutoring (VanLehn, 2006).

Substep-based tutoring
.76

Scaffolding and feedback at a level of detail that is even finer than the steps students would normally enter when solving a problem. (VanLehn, 2011).

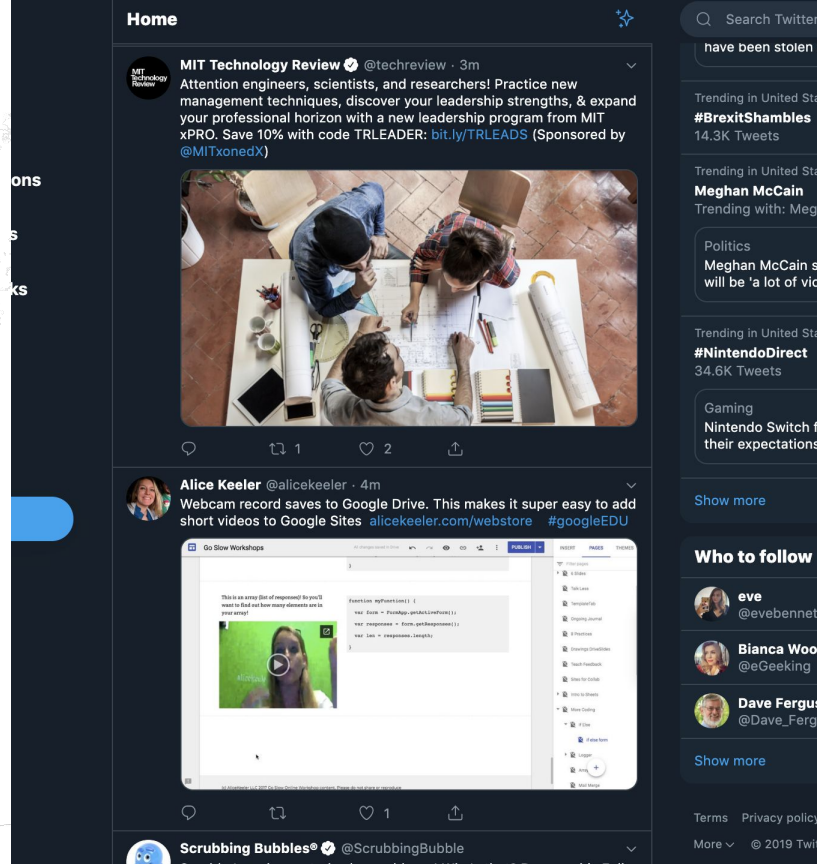
Intelligent Tutoring Systems



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Social Media for Learning

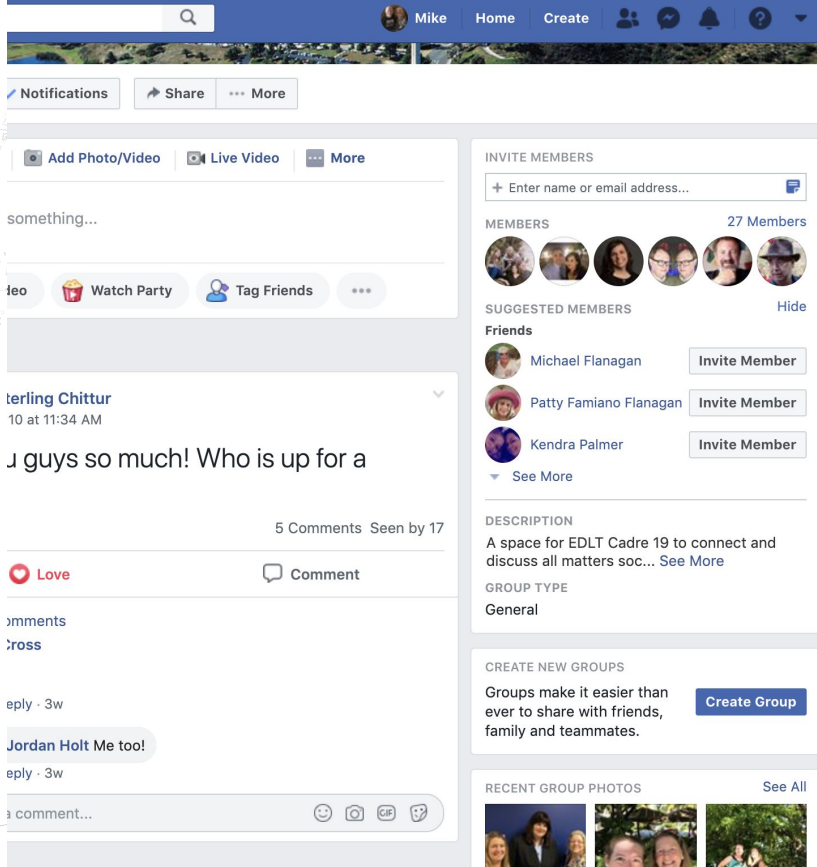
- Follow Influencers/Professional Development
- Share articles and developments in class using Class # / Custom Feeds
- Develop Communities



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Social Media for Developing Communities

- Follow Influencers/Professional Development
- Share articles and developments in class using Class # / Custom Feeds
- Develop Communities



TECHNOLOGIES ARE TOOLS... JUST TOOLS.

Virtual Labs,
Simulations
and Games

Adaptive Learning

Avoid Technological Solutionism: viewing “complex societal problems in a simplistic way, such that the solution can be the sale of a new app, new web service, or a new device, without exploring the broader environmental consequences”

Digital
Textbooks and
Content

Videos and
podcasts



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Change is HARD, but worth it.



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Change is HARD, but worth it.



Collaboration and knowledge sharing are KEY.

Embracing being a learner again.

Lean on Research.

Don't be afraid to fail. FAIL.



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Change is HARD, but worth it.

Faculty and Mentors serve an invaluable role.

It's up to you to make it work!!



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Practitioner Faculty are Domain Experts



Experience

- Mentor students
- Lead novice practitioners



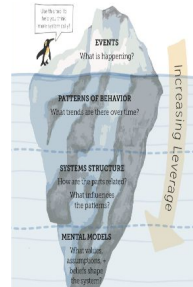
Theoretical Knowledge

- Application to practice
- Bridge the gap between knowledge and skills



Contacts

- Networking
- Professional relevance
- Future prospects



Cultural/Historical Knowledge

- Navigating the domain culture
- Future implications of past triumphs and failures

Learning as trajectory into a community of practice



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Social Learning & Identity

Considering the whole human

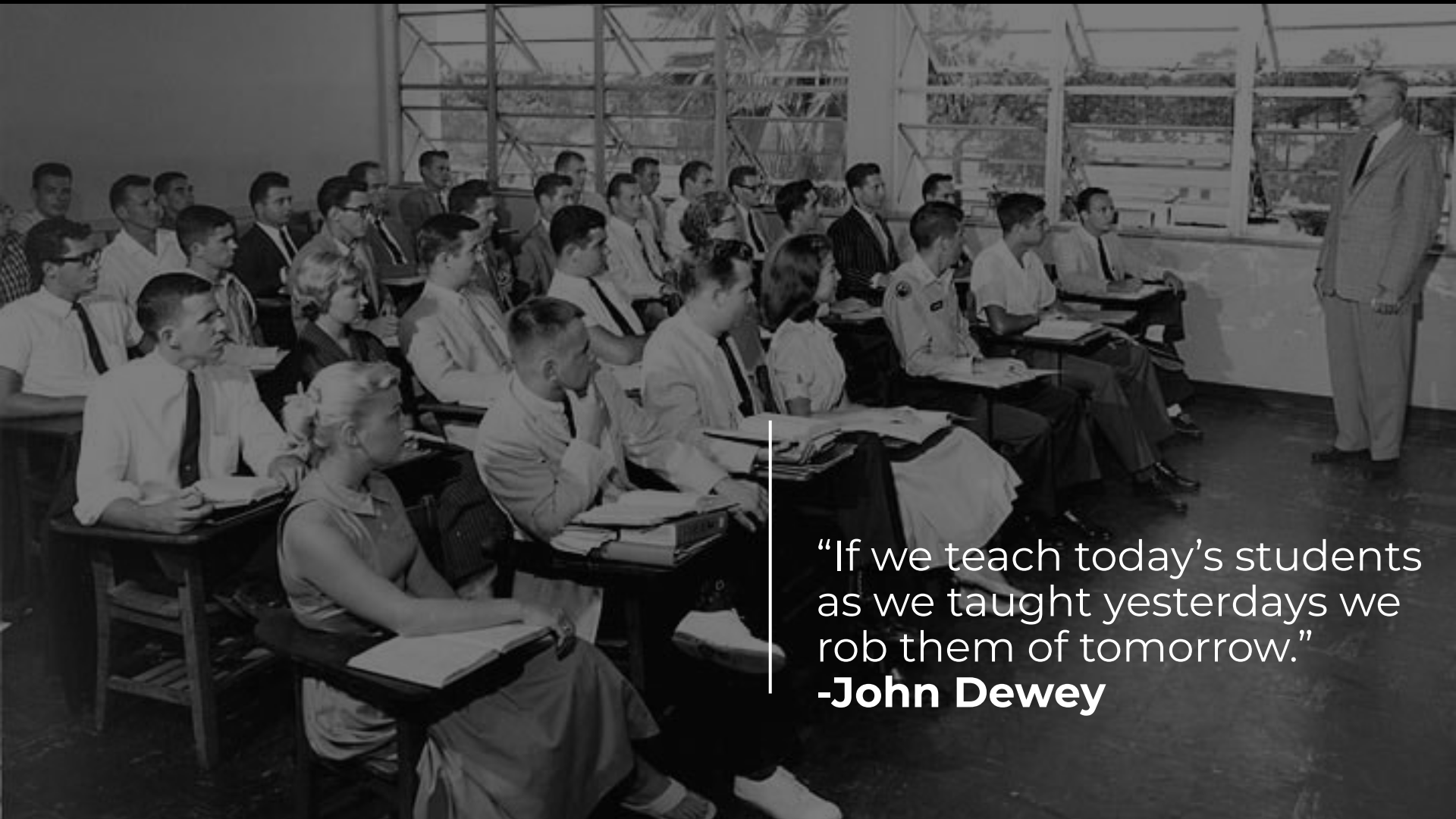


“Learning is inevitably implicated in the acquisition of knowledge, but it is also implicated in the acquisition of identity. People do not simply learn about; they also learn, as the psychologist Jerome Bruner (1996) suggests, *to be*. Learning, that is, doesn't just involve the acquisition of facts about the world, it also involves acquiring the ability to act in the world in socially recognized ways.” (Brown & Duguid, 2001)

Knowledge and Organization: A Social-Practice Perspective John Seeley Brown; Paul Duguid *Organization Science*, Vol. 12, No. 2. (Mar. - Apr., 2001), pp. 198-213.

Learning as trajectory into a community of practice





“If we teach today’s students
as we taught yesterdays we
rob them of tomorrow.”
-John Dewey

THANK YOU.



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