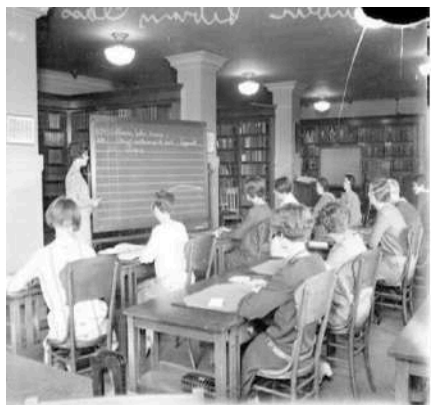1919 classroom

2019 classroom

1950 With air-condition

2019 with air-condition

1960 portability

2019+ portability

2020+

2030+

Target Learning Outcomes of Education 4.0

Feliece I. Yeban, Ph.D.

PEMEA National Conference

1:00-3:00 PM

August 22, 2019

GO TO:

https://www.sli.do

ENTER CODE

#N069

"Today, because of rapid economic and social change, schools have to prepare students for:

– *jobs that have not yet been created,*

– *technologies that have not yet been invented and*

– *problems that we don't yet know will arise.*"

(Andreas Schleicher - OECD Education Directorate: 2011)

Here's a quick snapshot of current stats:

- 65% of children entering grade school this year will work in a job that hasn't been invented yet

- 49% of current jobs have the potential for machine replacement, with 60% having at least 1/3 of their activities automated

- 80% of the skills trained for in the last 50 years can now be outperformed by machines

- At a global level, technically automatable activities touch the equivalent of 1.1 billion employees and $15.8 trillion in wages
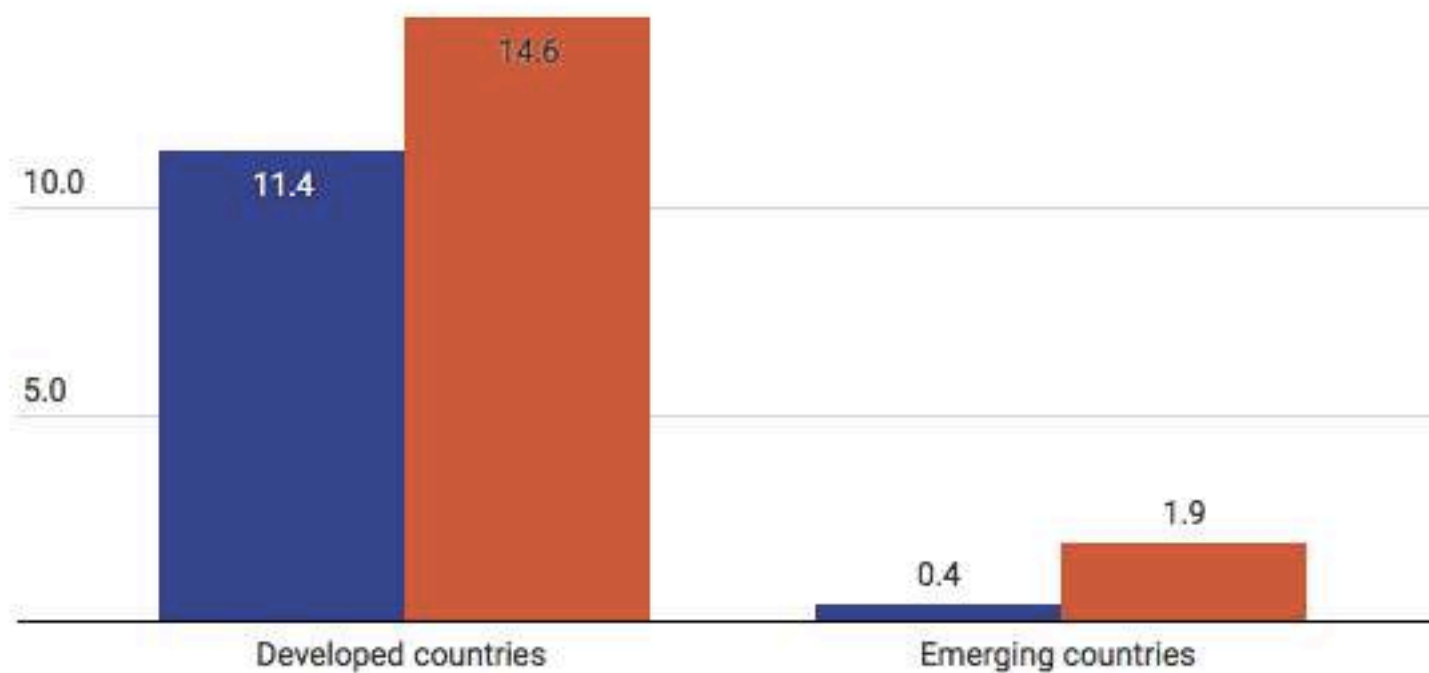
Rate of automation

Division of labour as share of hours spent (%)

	Human	Machine
2018	71	29
2022	58	42
2025	48	52
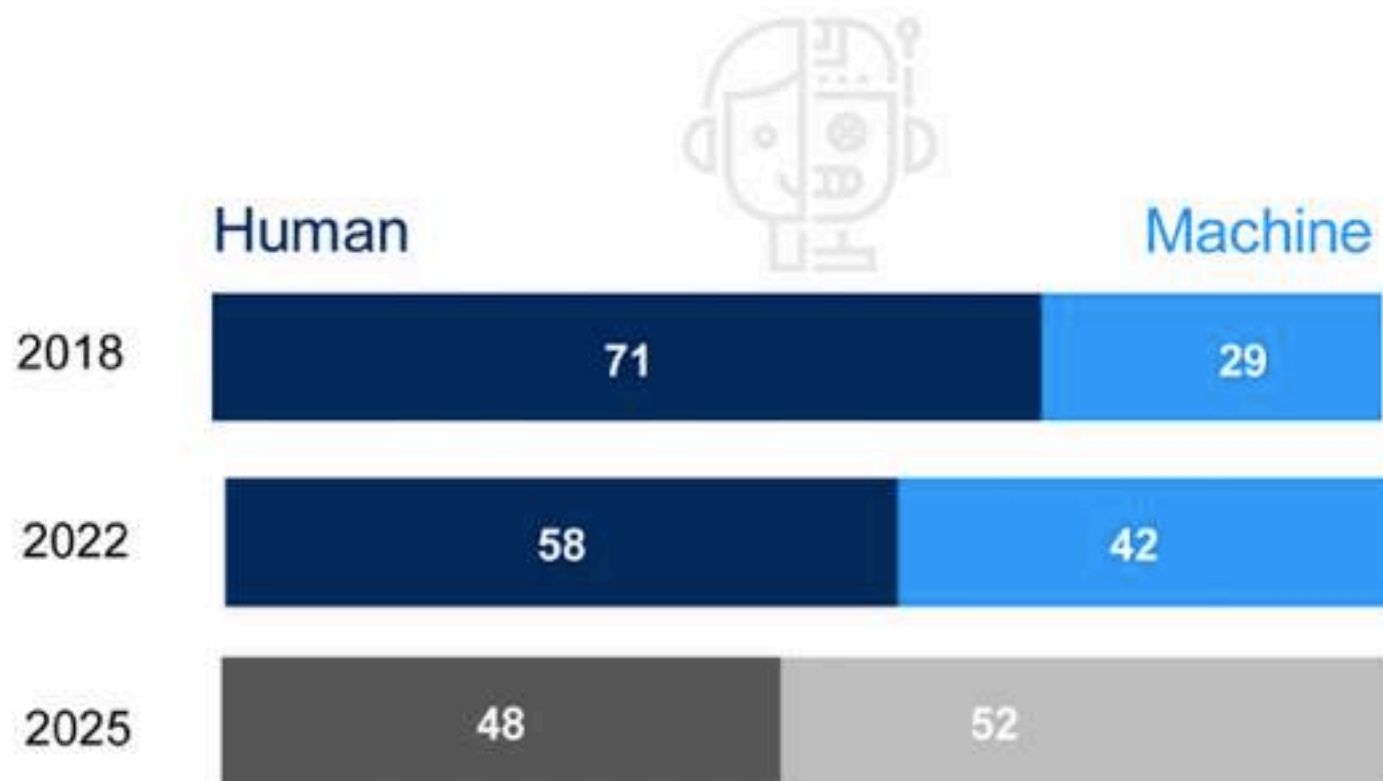
Robot density in manufacturing

Number of multipurpose industrial robots per 1,000 person employed in the manufacturing sector)

■ 2011 ■ 2015

	Developed countries	Emerging countries
2011	11.4	0.4
2015	14.6	1.9

The many faces of the robot revolution

	Humanoid Robots	Stationary Robots	Aerial and Underwater Robots	Non-humanoid Land Robots
Adoption among companies by 2022	23%	37%	19%	33%
First movers	(35%) Financial Services and Investors	(53%) Automotive, Aerospace, Suppy Chain	(52%) Oil and Gas	(42%) Automotive, Aerospace, Suppy Chain

With technological advances, jobs with these three qualities are most likely to be automated:

1. repetitive
2. based on rules
3. involve limited or well-defined physicality

The Jobs Landscape in 2022

emerging roles, global change by 2022

133 Million

Top 10 Emerging

1. Data Analysts and Scientists
2. AI and Machine Learning Specialists
3. General and Operations Managers
4. Software and Applications Developers and Analysts
5. Sales and Marketing Professionals
6. Big Data Specialists
7. Digital Transformation Specialists
8. New Technology Specialists
9. Organisational Development Specialists
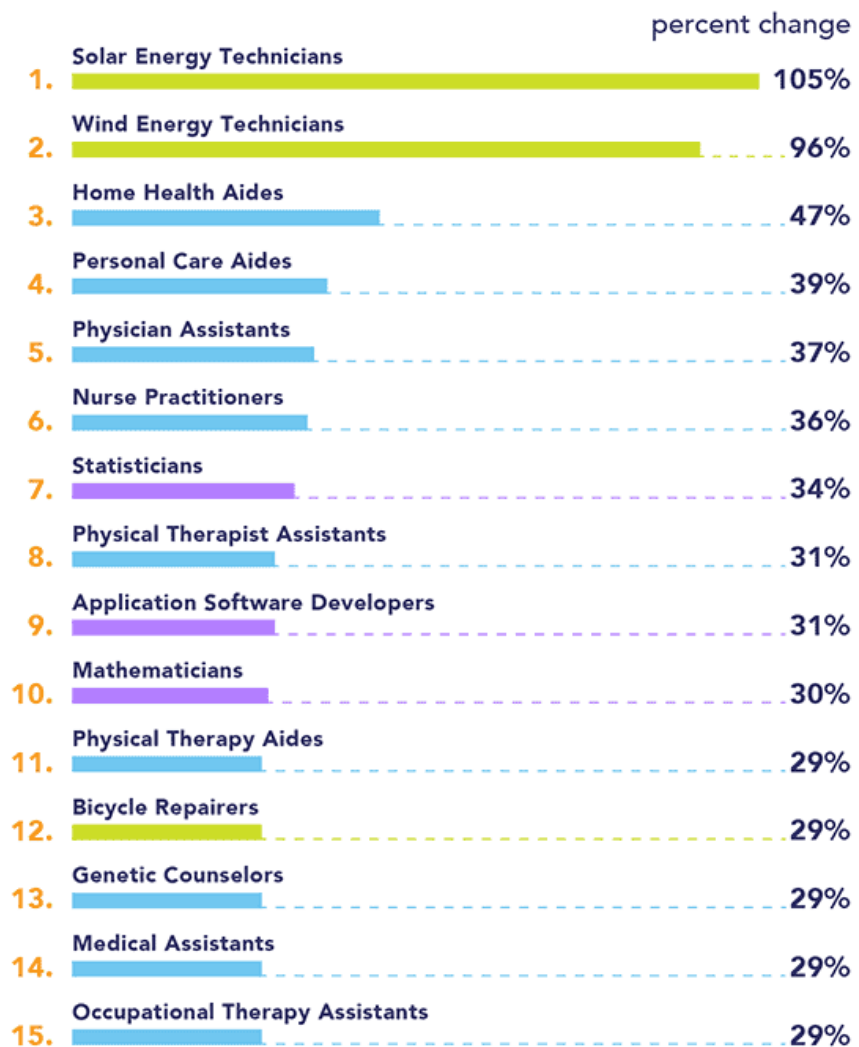10. Information Technology Services

declining roles, global change by 2022

75 Million

Top 10 Declining

1. Data Entry Clerks
2. Accounting, Bookkeeping and Payroll Clerks
3. Administrative and Executive Secretaries
4. Assembly and Factory Workers
5. Client Information and Customer Service Workers
6. Business Services and Administration Managers
7. Accountants and Auditors
8. Material-Recording and Stock-Keeping Clerks
9. General and Operations Managers
10. Postal Service Clerks

15 Fastest-Growing Occupations From 2016 to 2026

percent change

Rank	Occupation	Percent change
1.	Solar Energy Technicians	105%
2.	Wind Energy Technicians	96%
3.	Home Health Aides	47%
4.	Personal Care Aides	39%
5.	Physician Assistants	37%
6.	Nurse Practitioners	36%
7.	Statisticians	34%
8.	Physical Therapist Assistants	31%
9.	Application Software Developers	31%
10.	Mathematicians	30%
11.	Physical Therapy Aides	29%
12.	Bicycle Repairers	29%
13.	Genetic Counselors	29%
14.	Medical Assistants	29%
15.	Occupational Therapy Assistants	29%

Architects

11%

Automatable

Civil engineers

13%

Automatable

Construction managers

17%

Automatable

According to McKinsey, this is how AUTOMATABLE key jobs are:

Electrical engineers

21%

Automatable

Carpenters

50%

Automatable

Surveyors

56%

Automatable

Trends of the future: 2025 and beyond

- 10% of people will be wearing clothes connected to the internet
- 80% will have unlimited (sponsored) backup space in the cloud
- There will be one trillion sensors connected to the internet
- 80% of the world's population will have Internet presence
- The first automobile entirely produced with a 3D printer
- 90% of world's population will own a smart phone
- 90% of world's population will have internet access
- 10% of all vehicles on the roads will be driverless
- More than 50% of home appliances will be connected to internet
- More rides will be made on shared cars than on private cars

Source: World Economic Forum 2015

The **gig economy** refers to the shift away from traditional employment where workers are full-time employees of one employer to an economy where people are freelancers—working on contracts for multiple employers. The terms 'platform economy' or 'on-demand economy' are also widely used in some jurisdictions.

What is driving this massive change?

Klaus Schwab
Founder, WEF

Industrial Revolution

Agricultural Economy and Rise of Manufacturing

1782
Steam engine
Power generation
Mechanical automation

Knowledge Economy

1954
Computer, NC, PLC
Electronic Automation
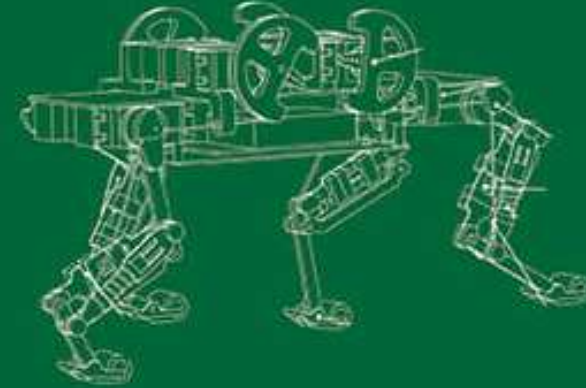
1.0   2.0   3.0   4.0

1913
Conveyor Belt
Industrialization
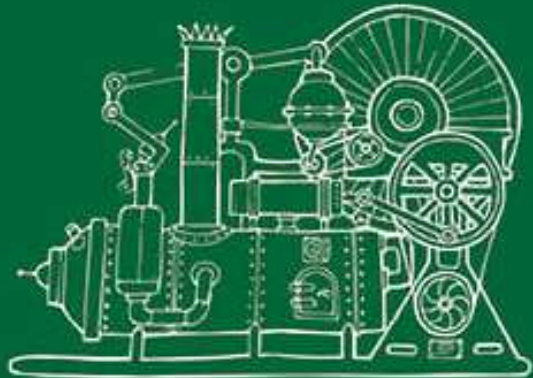
2015
Cyber Physical Systems
Smart Automation

Industrialized Mass Economy

Innovation Society

What is Education 4.0?

Paul Feldman, CEO, Jisc, the UK's technology solutions not-for-profit

"We know that some universities are already developing an Education 4.0 experience for students that reflects the fast-developing world around them.
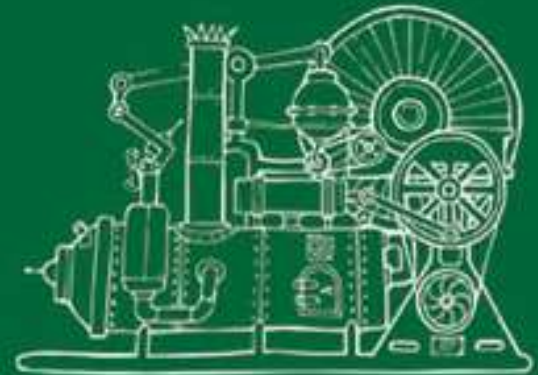
1. Western curriculum composed primarily of Religion, Latin & Rhetoric, Medicine, Philosophy & Humanities
2. Overlap of religious leaders as teachers
3. Sectarian education
4. Limited scale of education
5. Rote Learning

1782
Steam engine
Power generation
Mechanical automation

1.0

IR 1.0 and Education 1.0
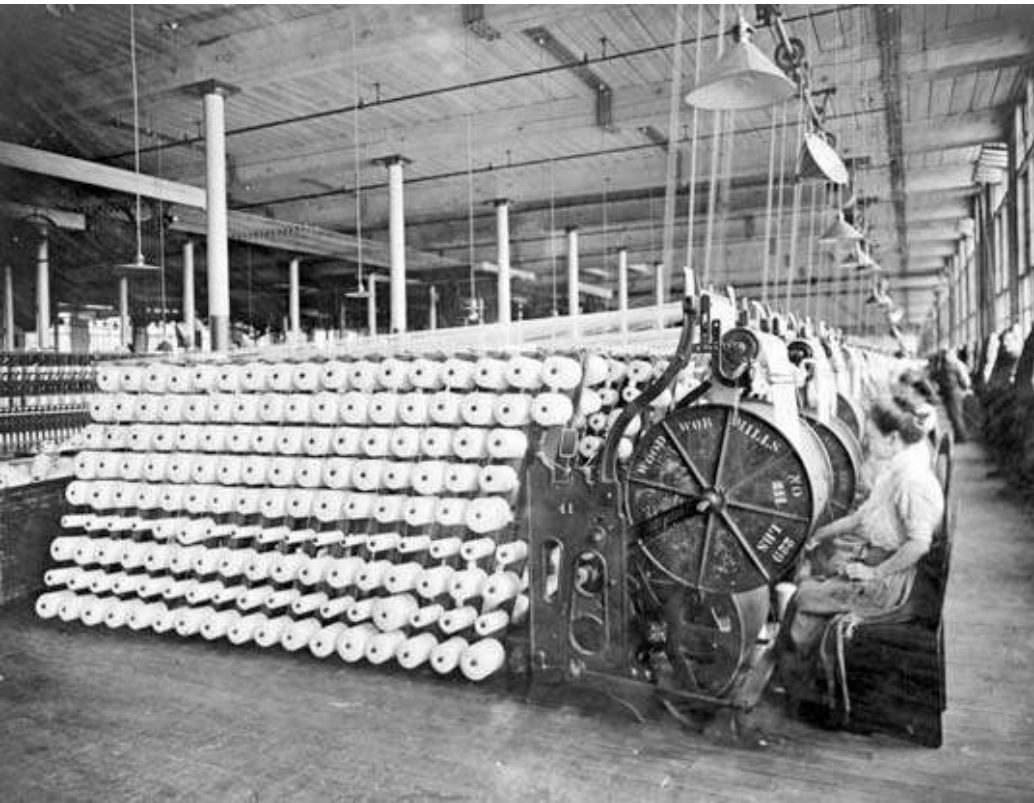
2.0

1913
Conveyor Belt
Industrialization

Education During American Colonialism

1. Essentialized curriculum organized along disciplines
2. Teachers as source of knowledge
3. Mass secular education
4. Learners as receptacles of knowledge
5. School is organized like a production line; one-size-fits-all
6. Lecture and memorization

IR 2.0 and Education 2.0
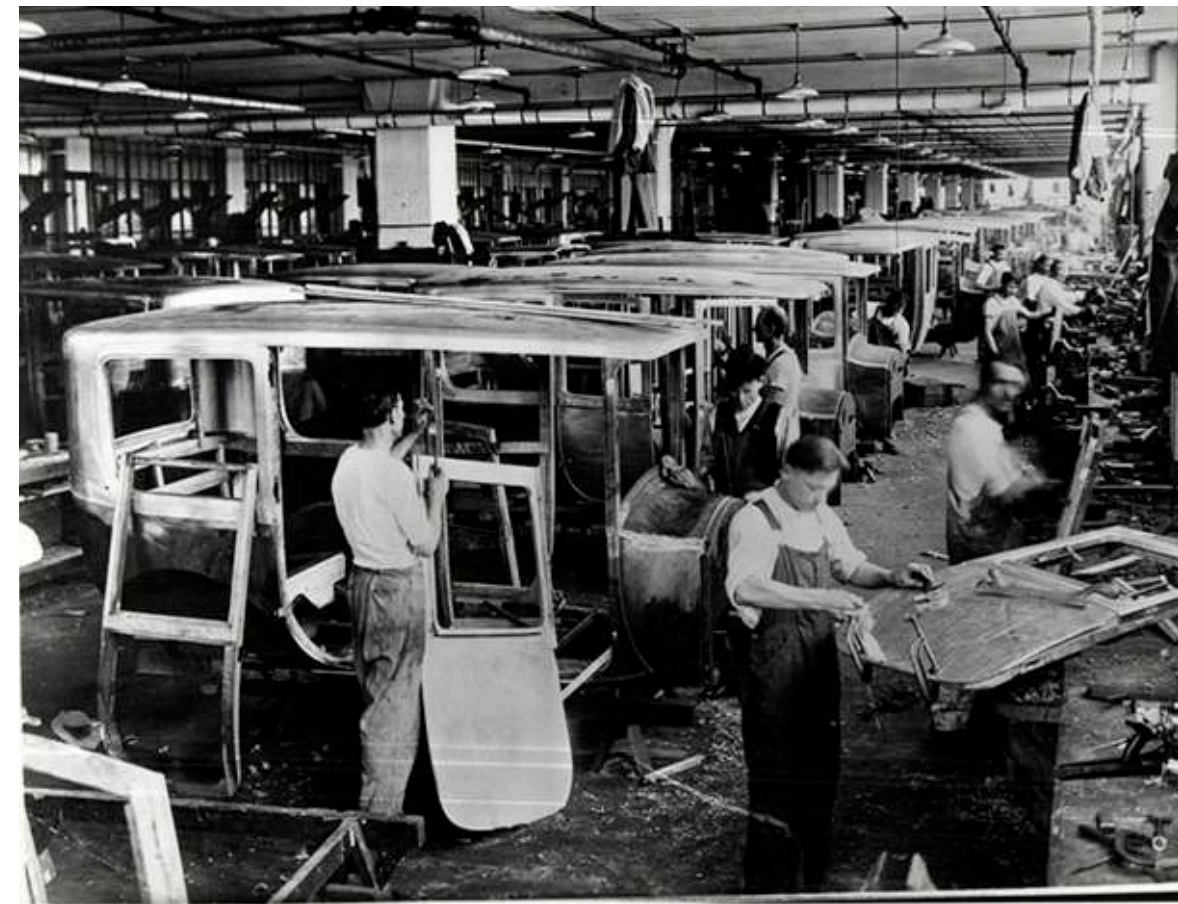
1. Outcomes-based curriculum
2. Teacher as orchestrator/facilitator
3. Learner-centered/ constructivist
4. Technology enabled and knowledge producing
5. Multi-disciplinary
6. Emphasis on HOTS

1954
Computer, NC, PLC
Electronic Automation

3.0
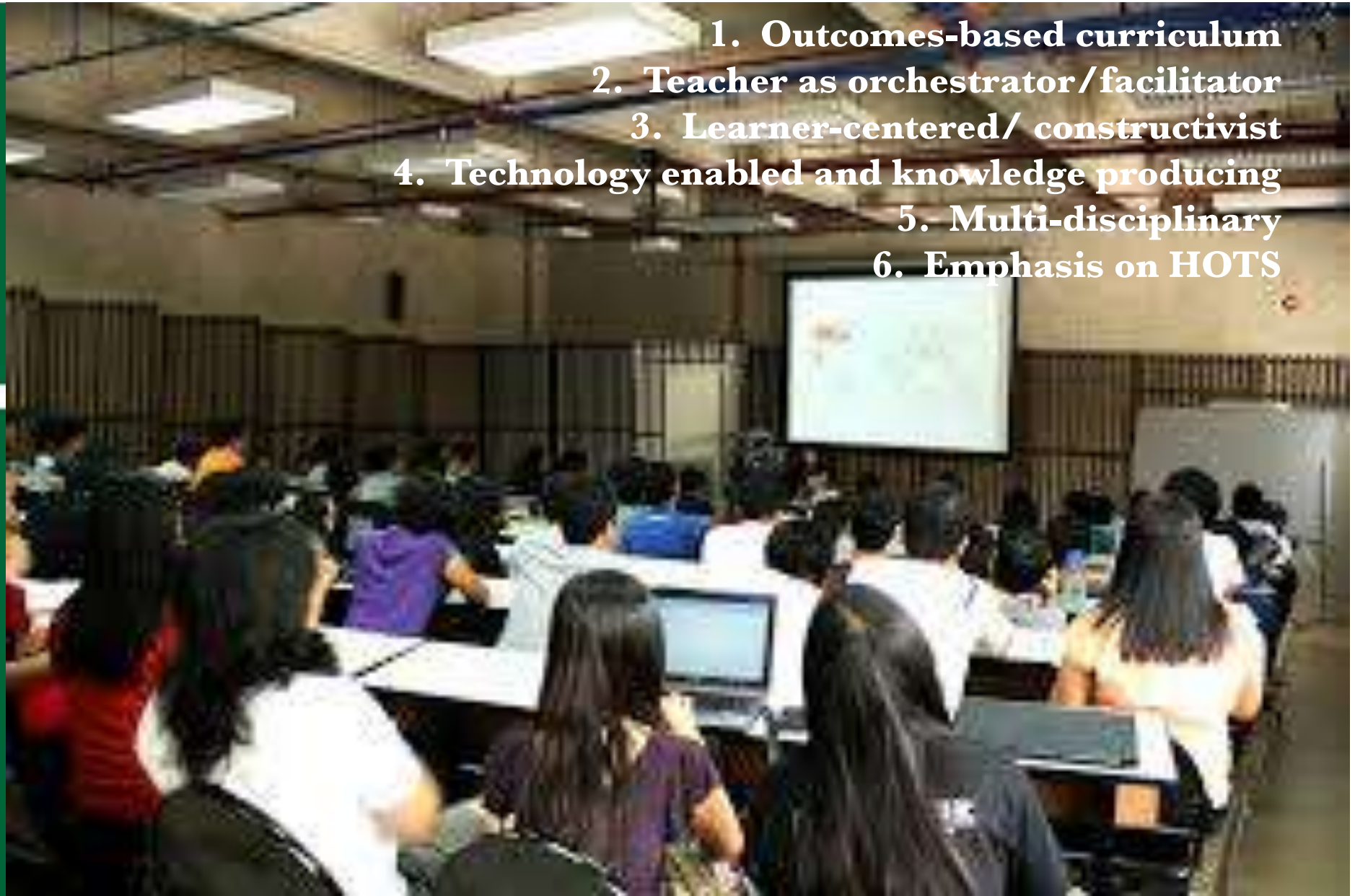
IR 3.0 and Education 3.0
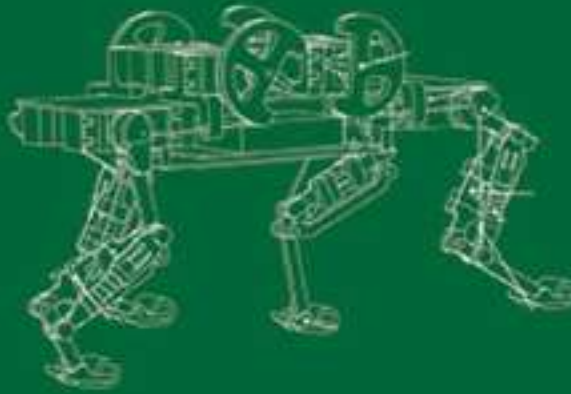
4.0

2015

Cyber Physical Systems
Smart Automation

1. Reality-based curriculum
2. Teacher is learning experience maker
3. Heutagogical
4. Innovation producing
5. Transdisciplinary and data driven (computational)
6. Transversal competence

Anywhere Anytime

Personal

Flexible Delivery

Peers and Mentors

Why/Where not What/How

Practical Application

Modular and Projects

Student Ownership

Evaluated not Examined

IR 4.0 and Education 4.0

Is **Education 4.0** a bandwagon we cannot afford to join in or an inevitable reality that poses an opportunity we can optimize?

What do all these imply on our work as educators?

iGEN as the new breed of learners

1.   The iGen learners favor storytelling, explainer videos, interactive games, collaborative projects, experiential learning, and other forms of visualization.

2.   They are good at video blogging and know that they have the opportunity to be financially independent of their parents by being a social media influencer. They have access to technologies that enable them to be entrepreneurial.

3.   They can work and study at the same time. Climate change, ecology-related issues, and healthy lifestyles are their preferred causes.

We are the fastest growing digital population in the world with **63%** of the population accessing the internet spending an average of **10 hours a day.**

Filipinos are the top internet users in the world with 47% of our online activities spent on social media.

Student Engagement — By Grade

% ENGAGED

Legend: ■ Engaged ■ Not engaged ■ Actively disengaged

Difference in the Percentage of Engaged Students Between Grade Levels

	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10	Grade 11	Grade 12
Engaged	74	67	54	45	40	33	32	34
Not engaged	18	23	28	31	34	34	35	34
Actively disengaged	8	11	17	24	26	33	34	32

Difference between grade levels: -7, -13, -9, -5, -7, -1, +2
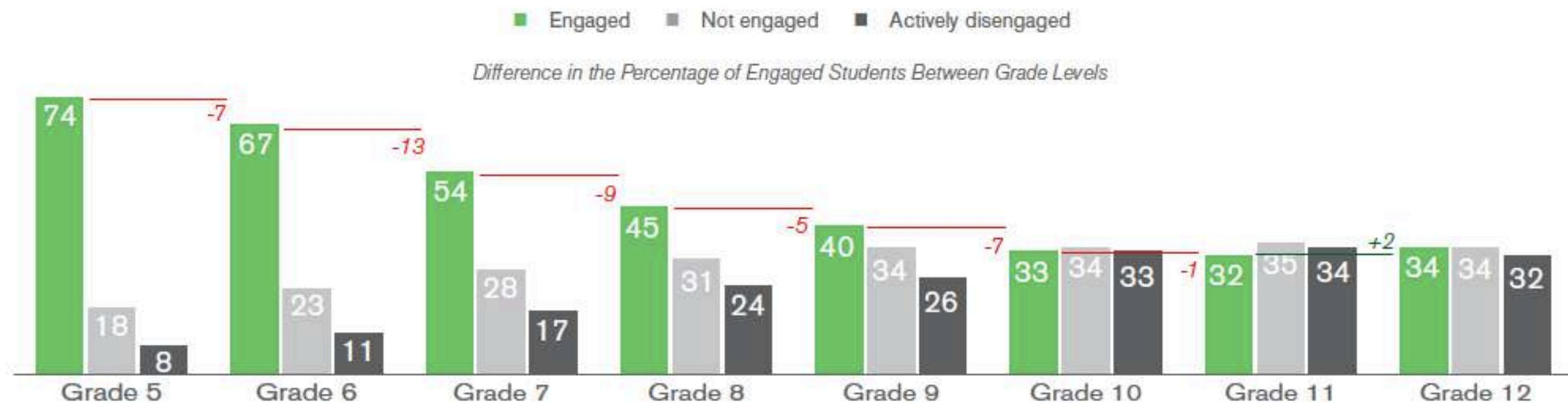
As grade level increases, the percentage of students who are engaged decreases, the percentage of students who are actively disengaged increases and the percentage of students who are hopeful marginally decreases.

A Glimpse into the Future of Learning

In the future...

"School" will take many forms. Sometimes it will be self-organized.

Learning will no longer be defined by time and place — unless a learner wants to learn at a particular time and in a particular place.

Learners and their families will create individualized learning playlists reflecting their particular interests, goals, and values.

Those learning playlists might include public schools but could also include a wide variety of digitally-mediated or place-based learning experiences.

Work will evolve so rapidly that continuous career readiness will become the norm.

These changes point the way toward a diverse learning ecosystem in which learning adapts to each child instead of each child trying to adapt to school.

Whatever the path, radical personalization will become the norm, with learning approaches and supports tailored to each learner.

Diverse forms of credentials, certificates, and reputation markers will reflect the many ways in which people learn and demonstrate mastery.

Educators' jobs will diversify as many new learning agent roles emerge to support learning.

For KnowledgeWorks' full forecast on the future of learning, see *Recombinant Education: Regenerating the Learning Ecosystem* knowledgeworks.org/strategic-foresight

As more people take it upon themselves to find solutions, a new wave of social innovation will help address resource constraints and other challenges.

At the same time, geographic and virtual communities will take ownership of learning in new ways, blending it with other kinds of activity.

Some of those tools will use rich data to provide insight into learning and suggest strategies for success.

A wide variety of digital networks, platforms, and content resources will help learners and learning agents connect and learn.

KnowledgeWorks.

Life-long Learning vs Life-long Adaptability

Curriculum vs Individualized Learning Playlist

From CONTENT TO CONTEXT

Outcomes-Based vs Solutions-Oriented Education

Home / Features / 8 Pinoy innovators who have inspired on global stage

8 Pinoy innovators who have inspired on global stage

By *Newsbytes.PH* on July 26, 2019

f **SHARE**   **TWEET**   P **SHARE**   8+ **SHARE**   **0 COMMENTS**

By Diana Princess Yamashita

When thinking of Filipinos that have shined on the world stage, we customarily visualize Filipinos that have excelled in the field of either sports or performing arts.

Yet Filipinos are also great innovators in tech and business, as recent history shows. We've collected the stories of eight Filipinos who have recently earned international awards and recognition as top performers in these respective fields.

While each hails from different parts of the Philippines — to even Singapore — they are all united in their shared excellence.

Teacher
Vs
Learning Experience Designer and Learning Coach

From Students to Knowledge Co-Creator and Communicator

The classroom - from learning space to maker-space

4 Key Technologies That Can Innovate Teaching

SOCIAL

Social Media

How do we optimize social media in the courses that we teach to enhance student experiences and learning?

MOBILE

M-Learning

How do we design our courses in such a way that students' access to mobile technology improve their learning practices?

ANALYTICS

Internet of Things

How do we embed in our course management data capture and tracking which can be used for instructional decisions? How do we use data to drive learning?

CLOUD

Resource Sharing & Remote Learning

How do we use our courses to make our students and ourselves visible in the cyberspace?.
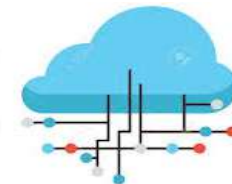
KAHOOT.IT   **QUIZLET**   **PURPOSE GAMES**

Make Your Own Online Games! It's Completely Free!

Baseball	BeeKeeper	Bingo	Build Your Knowledge	Crossword
Flashcards	Hangmoon	Have U Herd	Jeopardy	Matching
Rapid Fire	Spin to Win	Tic-Tac-Toe	Time Out	Triviatron

Games Appeal to Your Students' Need to Succeed

WISC-ONLINE GAMES

KUBBU

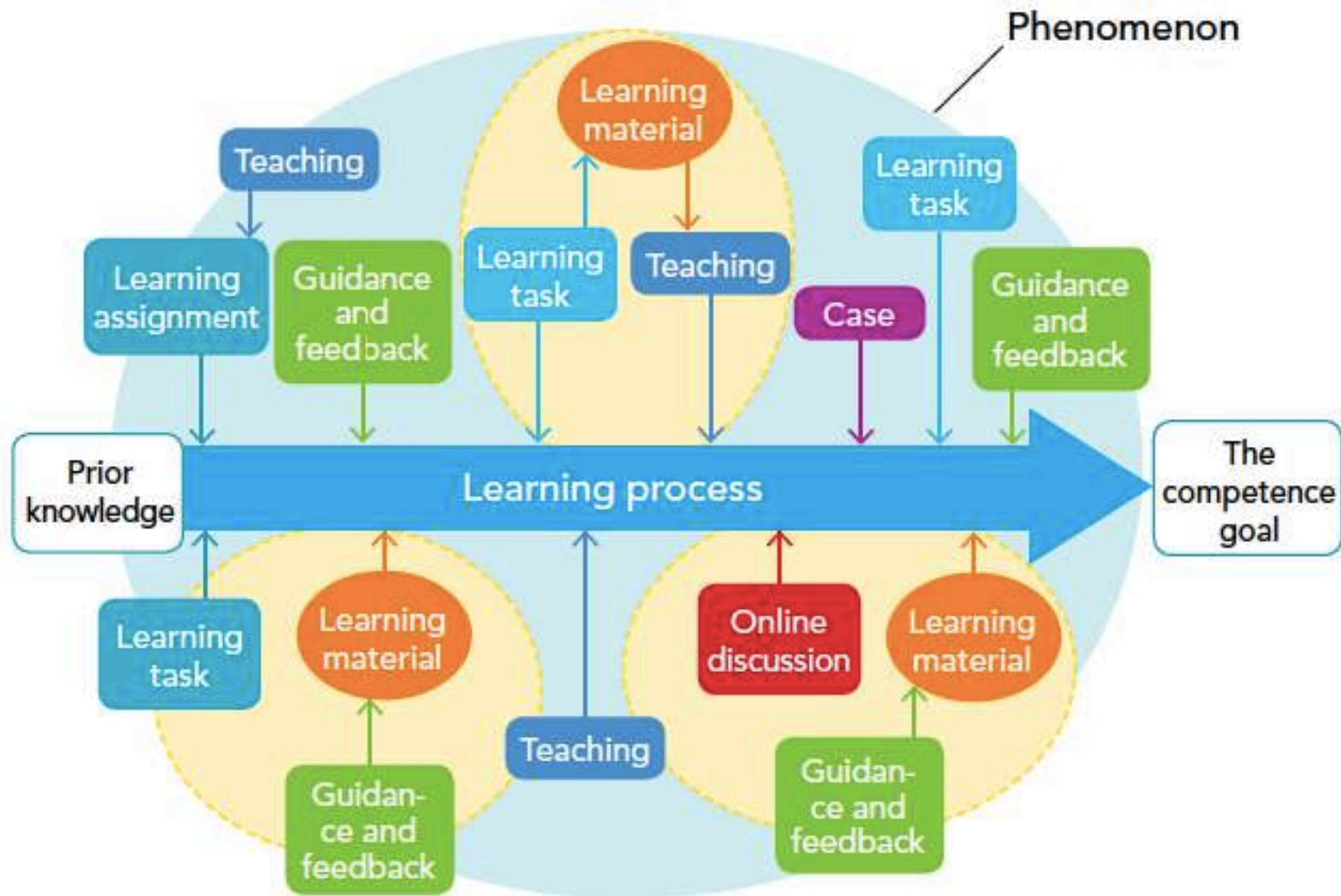**SUPER TEACHER TOOL**

FLIPPITY GAME SHOW

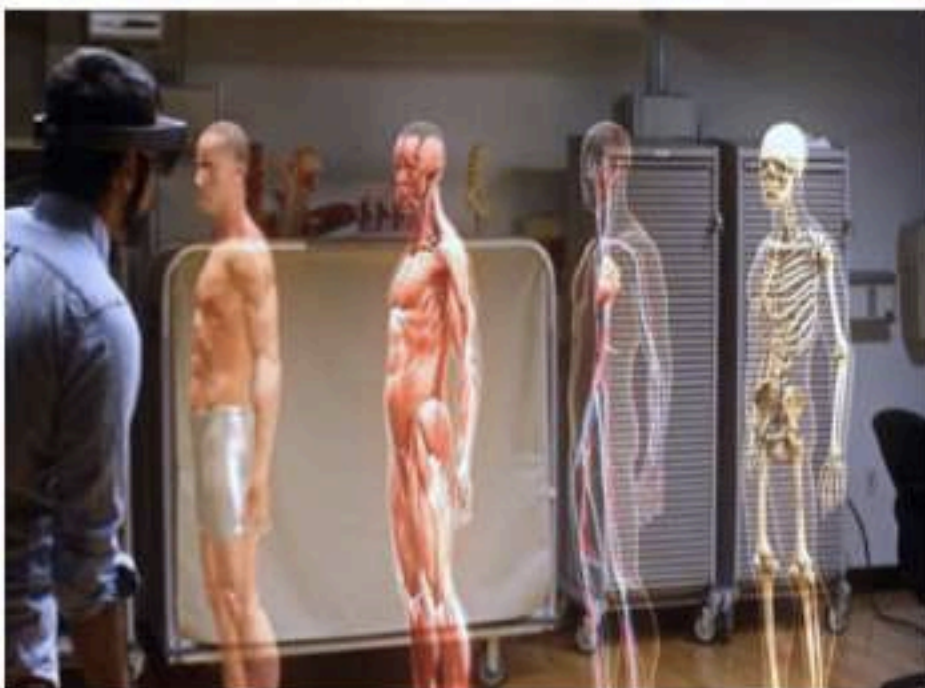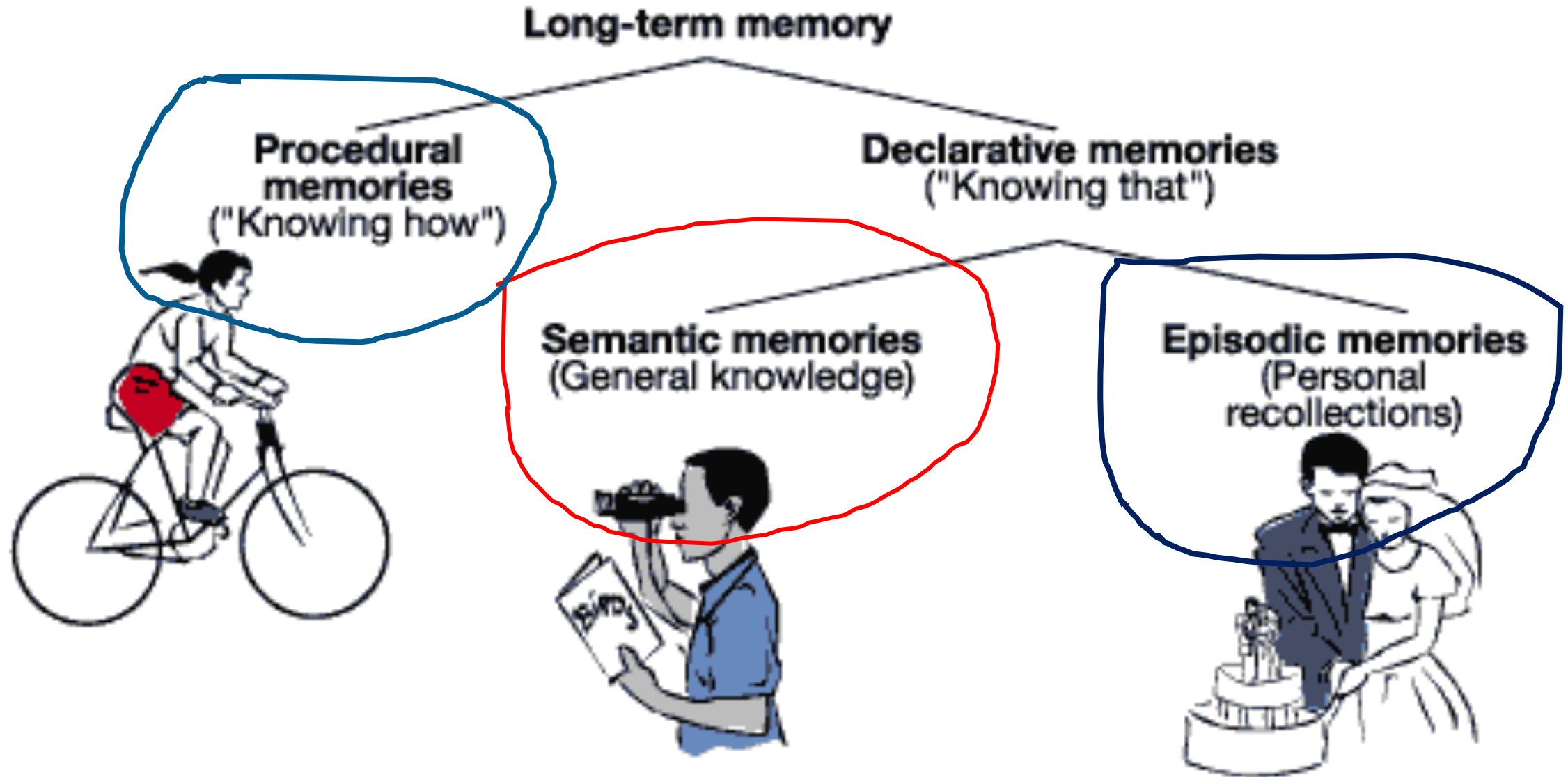**FLING THE TEACHER**

TEACHER INVADERS

MATCH-UP

Transversal Competencies

Credits to Pasi Mattila and Pasi Silander

Brain Default – We tend to forget

Long-term memory

Procedural memories ("Knowing how")

Declarative memories ("Knowing that")

Semantic memories (General knowledge)

Episodic memories (Personal recollections)

A Synthesis

CHALLENGES

- C1 **V**olatile
- C2 **U**ncertain
- C3 **C**omplex
- C4 **A**mbiguous

RESPONSES

- R1 **V**ISION
- R2 **U**NDERSTANDING
- R3 **C**REATIVITY
- R4 **A**GILITY
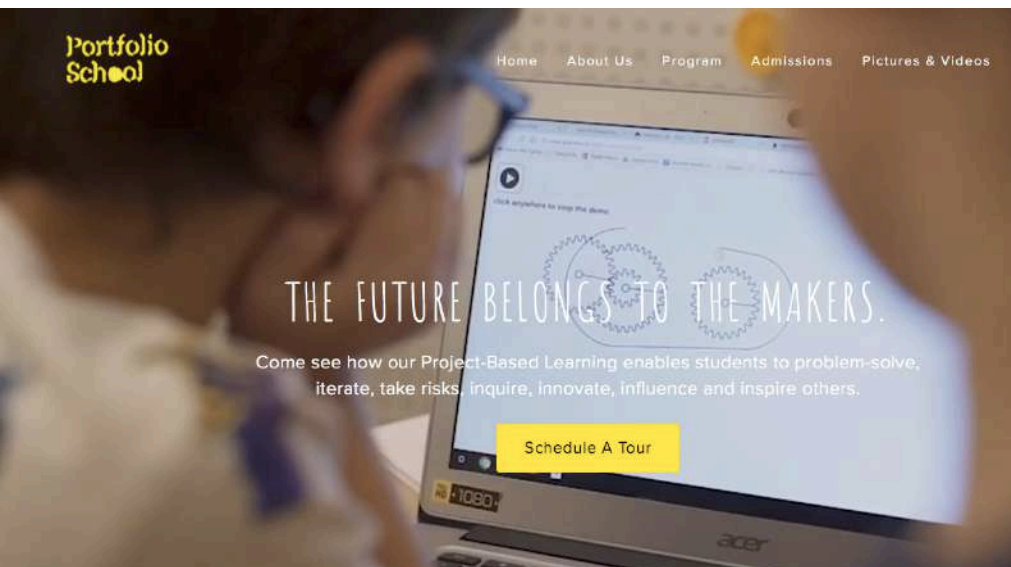
NURTURING FUTURE-READY and ADAPTIVE SELD-DIRECTED LEARNERS

Target Learning Outcomes will be:

- Customized
- Context-Based
- Self-Paced
- Problem-solving and Design-oriented
- Emergent and not fixed
- data analysis skills-oriented

THE FUTURE BELONGS TO THE MAKERS.

Come see how our Project-Based Learning enables students to problem-solve, iterate, take risks, inquire, innovate, influence and inspire others.

Schedule A Tour

QUANTUMCAMP

Curriculum * Classes * Camps

Real World Quests and Apprenticeships
Hands on learning for 21st Century skills.

ACTON ACADEMY

Explore our Main Campus   Find a School   Launch an Acton Academy

Elementary   Middle   Launchpad   Elementary Blog   Middle School and Launchpad Blog   Parent Blog   Parent Login

Join us for our next Open House on Wednesday, October 9 from 6pm - 7:30pm at the Main Campus on 2201 Alexander Ave. Austin, TX

Launch your Hero's Journey

sli.do

"The School of
the Future
is Created by Visions"