Education Informatics Workshop: Cyber-Physical Learning Environment to ensure Authentic Learning Fortified with MetaCognitive and Reflective Assessment

Workshop Organizers

Tosh Yamamoto, Ph.D

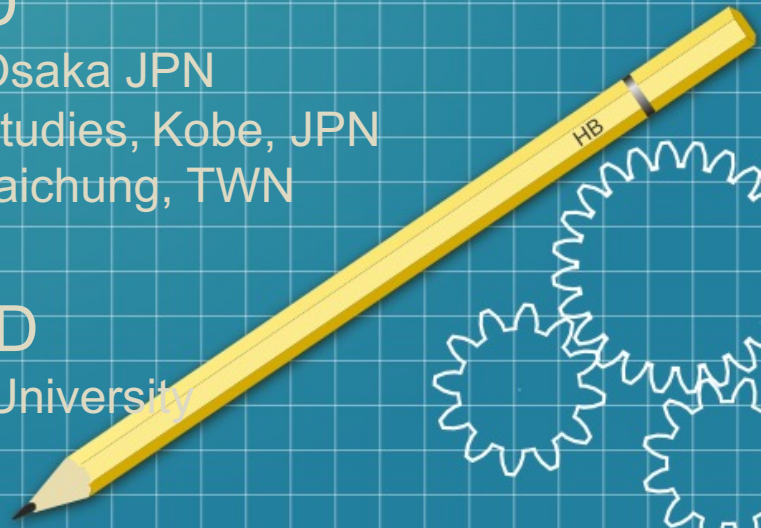
Researcher: CTL -Kansai University, Osaka JPN

Professor: Kansai University of International Studies, Kobe, JPN

Visiting Chair Professor: Asia University, Taichung, TWN

Yasuhiro Hayashi, Ph.D

Professor:Data Science, Musashino University



TOSH A. F. YAMAMOTO, PH.D.

ICT-Enhanced Active Learning
Curriculum, Instruction, eLearning, ePortfolio, COIL, Online Collaborative Learning
Critical/Creative Thinking & Negotiation Practicum for Trust Building
Tesseractive Global Education (PBL, TBL, AGILE)
Corporate Human Resource Training & Development

https://www.linkedin.com/in/tosh-yamamoto-4ab2b627/

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Profile

KEYNOTE Presentations

Research Grant Details . . .

Professional

KDD (Int'l Telephone and Telegraph)
★ Tokyo, Japan

West Virginia University
Graduate Assistant (Linguistics, Foreign Languages, ESL)

Michigan State University
Graduate Assistant (Foreign Languages, Computer Lab.)

Japan Center for Michigan Universities
Instructor (Foreign Languages, Computer Lab.)
★ Shiga, Japan

Rose-Hulman Institute of Technology
- Assistant Professor (Humanities and Life Sciences)

★ Terre Haute, Indiana

Indiana State University
- Project Manager (Faculty Computing Resource Center)
- Media Technology Fellow (Multimedia Lab.)

Rose-Hulman Institute of Technology
- IT Liaison (Vigo Country Middle Schools)

★ Terre Haute, Indiana

Kanazawa Institute of Technology
- Professor (Media Informatics)
- Head of Dept. of Media Informatics

★ Kanazawa, Japan

Kansai University
- Professor (Center for Teaching and Learning)
- Associate Dean of Division of Educational Promotion and Development

★ Osaka, Japan

K - 12 | 1978 | 1982 | 1986 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | . . .

Education

West Virginia University, Morgantown, WV, 1986
M.A.. Linguistics.

Sophia University
Tokyo, Japan, 1982
M.A.. Linguistics.

Dokkyo University,
Saitama, Japan
B.A., Foreign Languages,

Michigan State University,
East Lansing, MI
Ph.D. (ABD). Linguistics.

Indiana State University,
Terre Haute, IN, 2002
Ph.D. Curriculum, Instruction & Media Technology

Presentations & Publications

Kanazawa Institute of Technology
Professor,
Dept. Chair : Media Informatics

Kansai University
Professor
CTL, Educational Promotion and Development

Asia University, 亞洲大學
Visiting Chair Professor

Academic Dedication to Education

Career Development

Philosophy

Decisions you make dictate the life you lead.

Strengths

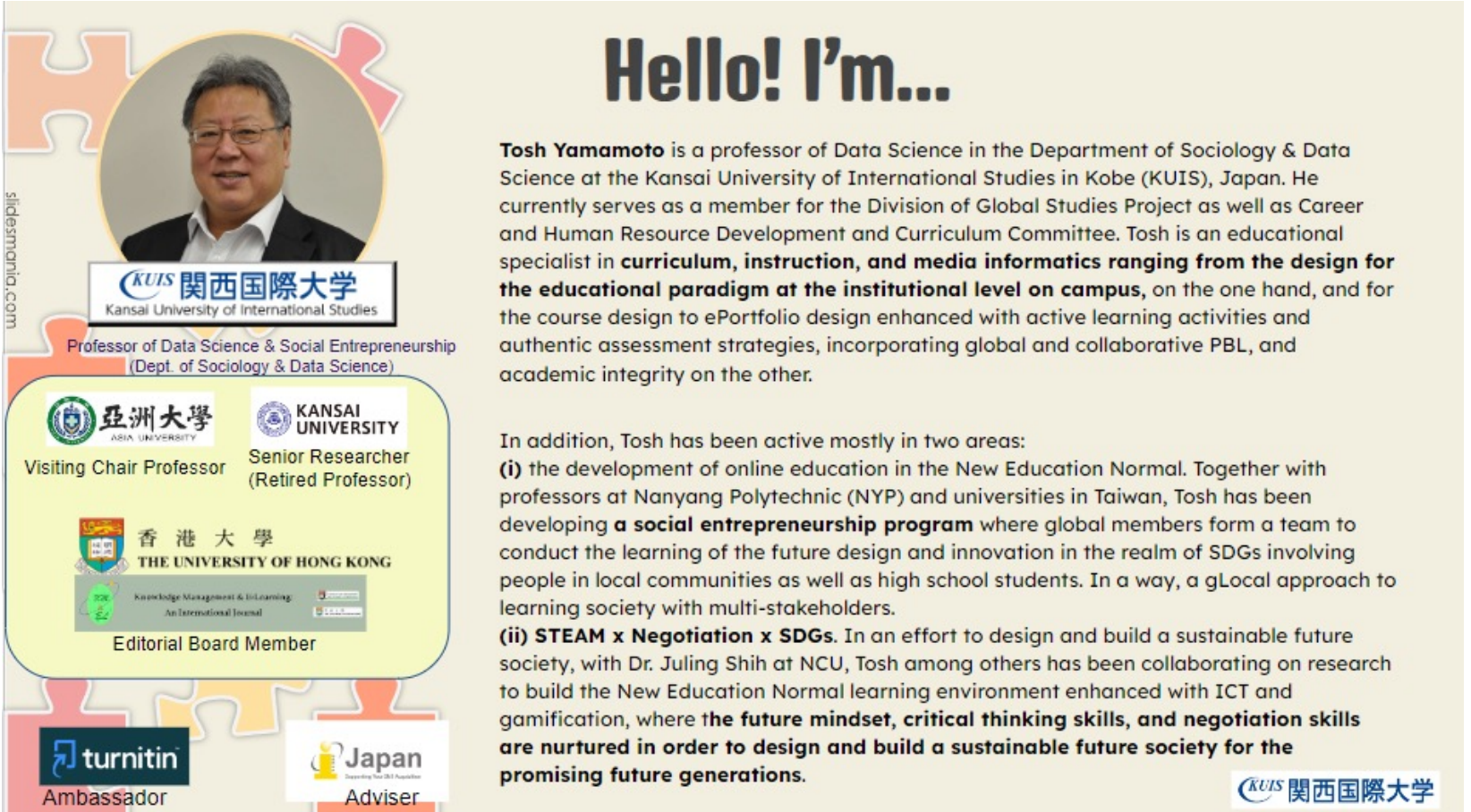
Sense Making
Social Intelligence
Novel & Adaptive Thinking
Cross-Cultural Competencies
Computational Thinking
New Media Literacy
Transdisciplinarity
Design Mindset
Cognitive Load Management
Virtual Collaboration

Off-Site Activities

Organic Farming Operation by IoT & AI

Ocean FISHING

Profile: Tosh Yamamoto



Goal of Workshop:

Description:

During the pandemic, enforced online learning has changed adolescent learners' learning paradigms and mindsets. And yet, traditionally trained teachers tend to cling to their familiar old-fashioned style of teaching with dignity. However, on the other hand, the young struggled and explored new strategies to be ready for the VUCA. Now workplaces are full of AI-initiated innovations to reduce human errors and stresses from work. The motive is not to give humans a hard time or stress, but rather the coming of an enriched future society. The future of the young generations is full of dreams and ideas of wellness to enrich the future of society. This workshop tries to shed some promising light on adolescents who want to explore their active learning for the benefit of their future lives as well as to young professors full of dreams and hopes to work on developing their professional skills to be promising teachers to contribute to future generations.

Speakers/Presenters

This workshop is lined up with carefully selected experienced professors in the field of Cyber-Physical learning environments across the border of campuses in the Big Asia region. (Some may not be present due to their teaching schedules.)
For example, in the field of metacognitive reflective assessment for active learning in an authentic way, Dr. Hayashi and Dr. Tosh Yamamoto extend their currently working research.
In the field of STEM / STEAM for K-12 as well as In the associated fields of STEM & STEAM with COIL in higher education, Prof. Juling Shih and Prof. Cathy Chen share their current progress in their educational research. In the field of AI-enhanced writing with global collaborative authentic learning, Prof. Peggy Tsai and Prof. Rushan Chen will elaborate on their recent research. Prof. Chris Pang shares his experience in the AI use for skill assessment.
In addition, prominent showcases of our educational practices are demonstrated from the area of COIL-based social entrepreneurship (Tosh Y and Benson O)
Dr. Hayashi elaborates on our recent progress and the direction of our research.
Finally, the workshop concludes with a proposal for the integration of all the above for the benefit of future education in the post-pandemic era.

Outline ： Schedule (14:00 – 17:30)

[14:00 – 15:30] - FOCUS: K-12 STEAM

(1) the general overview of the education paradigm presented by Tosh and Dr. Hayashi

(2) Innovative approach of K-12 STEAM cases by Juling'Shih's graduate student, Jenny Tsai, and possibly Cathy (National Pingtung University).

If time allows, we will move forward and get into (3) the turf of EMI and writing enhanced with AI by Prof. RuShan Chen and Prof. Peggy Tsai.

COFFEE BREAK (the poster area)

[16:00 – 17:30]] - FOCUS: K-12 STEAM and beyond & Higher Education

For the second half, the workshop focuses on:

(3) EMI and AI enhanced global collaboration.

Prof. RuShan Chen and Prof. Peggy Tsai are the expertise in this area. EMI and AI enhanced learning will be presented here. Peggy's presentation on AI-enhanced learning and RuShan's COIL-based EMI writing courses are elaborated. Also, on-going projects like ours will be given here.

Prof. Chris Pang may share his view on educational use of AI in the future of education.

(4) Also, on-going projects like ours will be given here. COIL-based entrepreneurship in the realm of SDGs. If Benson is available, he shares his experience in COIL-based Social Entrepreneurship with Kansai University and KUIS.

(5) Dr. Hayashi will present our recent development from the light of Data Science and the cyber physical learning environment for authentic learning.

And at the end, we will have an open discussion at the end to wrap up.

Visit the poster session area!

A Proposal for Post-Pandemic Educational Paradigm to Improve the Sustainability of a Global Learner Community consisting of learniners with different time zones, spaces, cultures, and languages

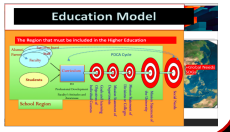
Tosh YAMAMOTO, Data Science in Sociology, KUINS
Yasuhiro HAYASHI, Data Science, Musashino University
Zhihua ZHANG, Data Science in Sociology, KUINS

(ID 057)

Educational Paradigm

Education Model must reflect:

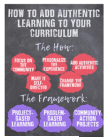
- Global Needs in the Future Society
- Authentic Assessment in the Authentic Curriculum
- New Education Normal
  - Singularity (2045)-Ready



Future Skills

Authentic Learning

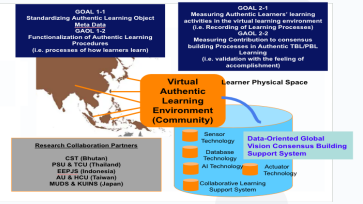
How to make Authentic Learning Experiences Real World and Relevant to Future Society?



Global Liberal Arts

Authentic Learning / Assessment

This research addresses the challenge of solving fast-emerging global issues with young generation with future mindset. Traditional negotiation methods are too slow to react the change in the global society. To respond, a new system is proposed for global collaboration to make the future a better space to live. It will use data analysis and culturally aware discussions to develop "win-win" solutions for a better future. This system aims to train future generations to collaboratively create these solutions through effective communication and negotiation.



Theme of Research

Our Challenge: "Improving the sustainability of a global learner community consisting of learners with different time zones, spaces, cultures, and languages"
[Goal 1] To standardize authentic learning content items toward a proposal (learning objectives) that everyone can agree on.
[Goal 2] To calculate and realize the degree of contribution of learners in collaborative activities both in real space and online using cyber-physical systems

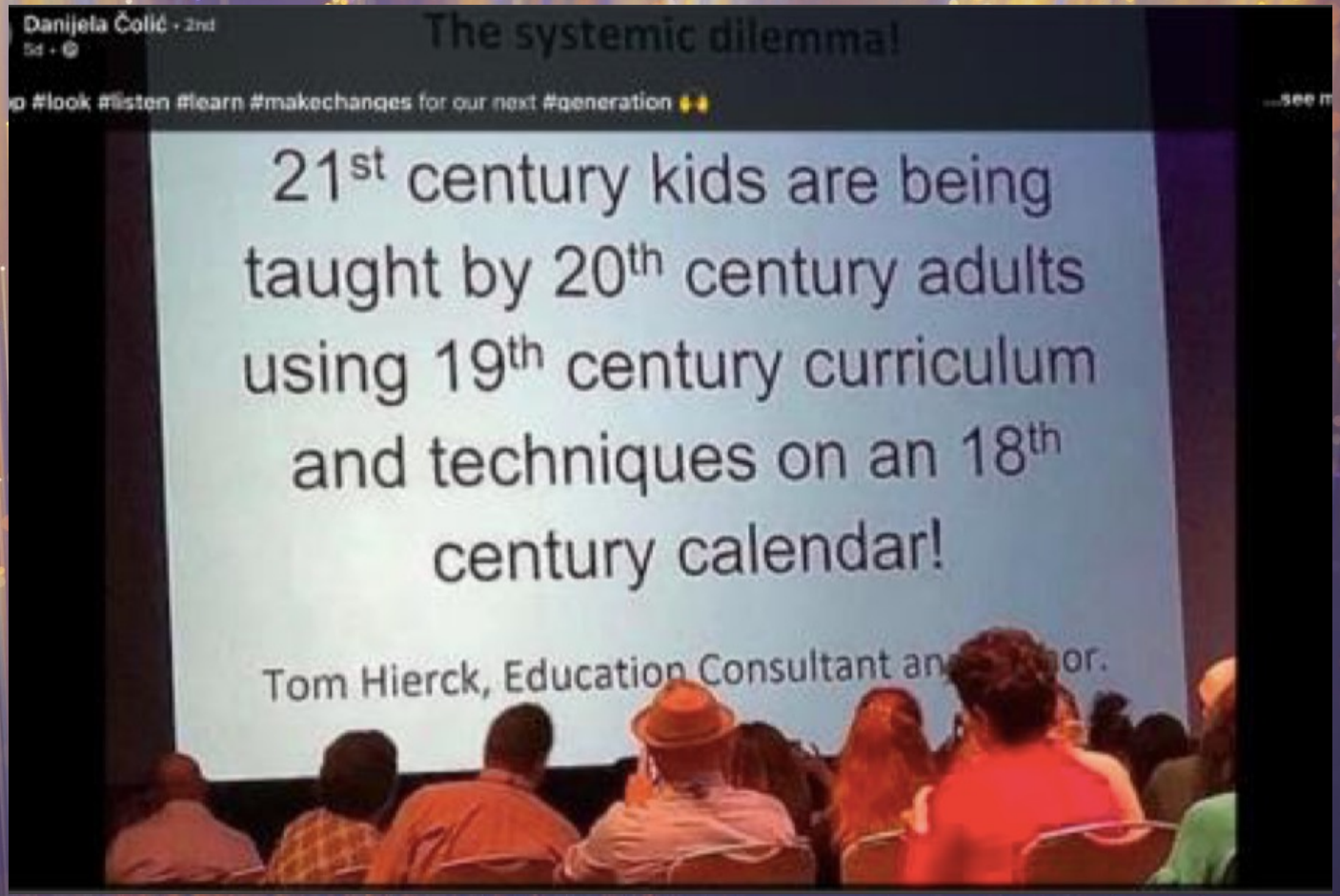
Educational Paradigm for Learning

Introduction

Introduction: Let's Start from here . . .

THE BIGGEST CHALLENCE IN EDUCATION TODAY!

EVEN BEFORE PANDEMIC!



From Facebook

Let's Start from here . . .

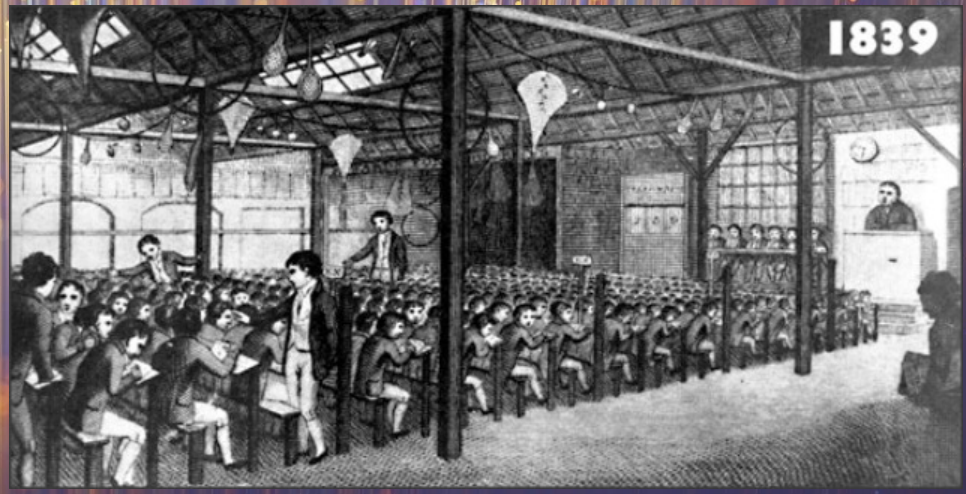
HISTORY OF EDUCATION

Educational Paradigm Today

The Prussian (German) Educational System

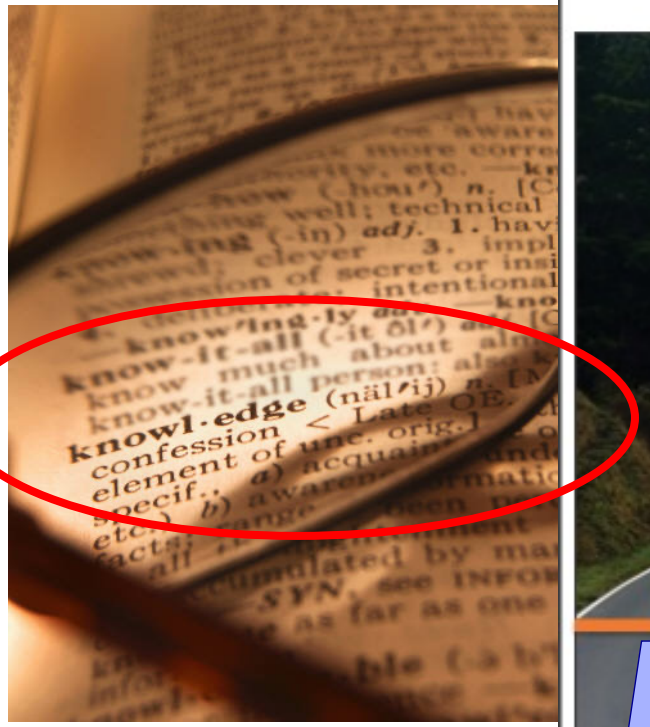
1806

https://feltd.wordpress.com/2010/09/16/the-prussian-german-educational-system/



The Role of University: LAST Gas Station for life?

Filling the knowledge tank in the students' brain for the life-long career?



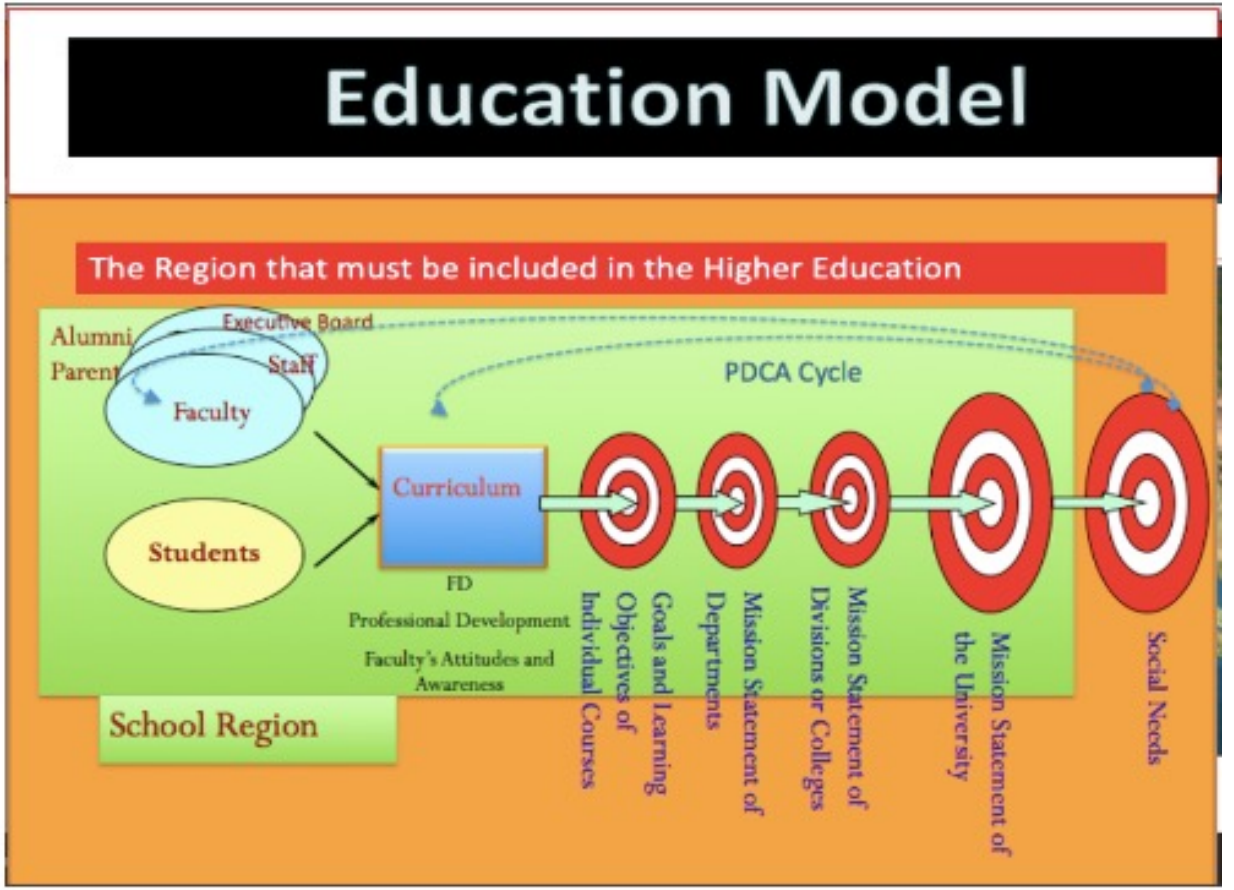
EDUCATION MODEL & PARADIGM

Education Model NOW

- GOAL: Wealth of a Nation
- Strong Economy

- Education Goal

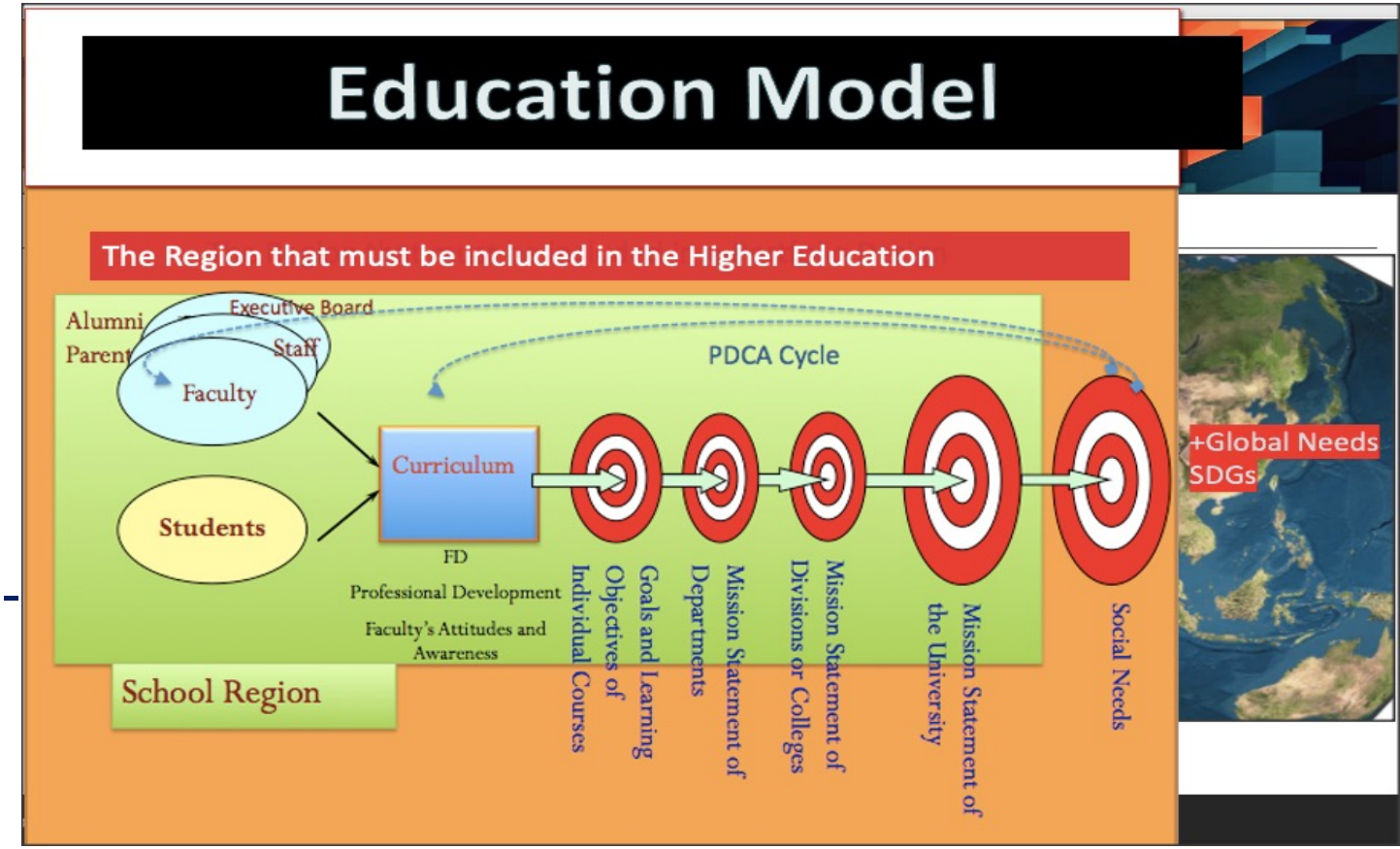
  - Enrichment of a Nation



Education Model must reflect:

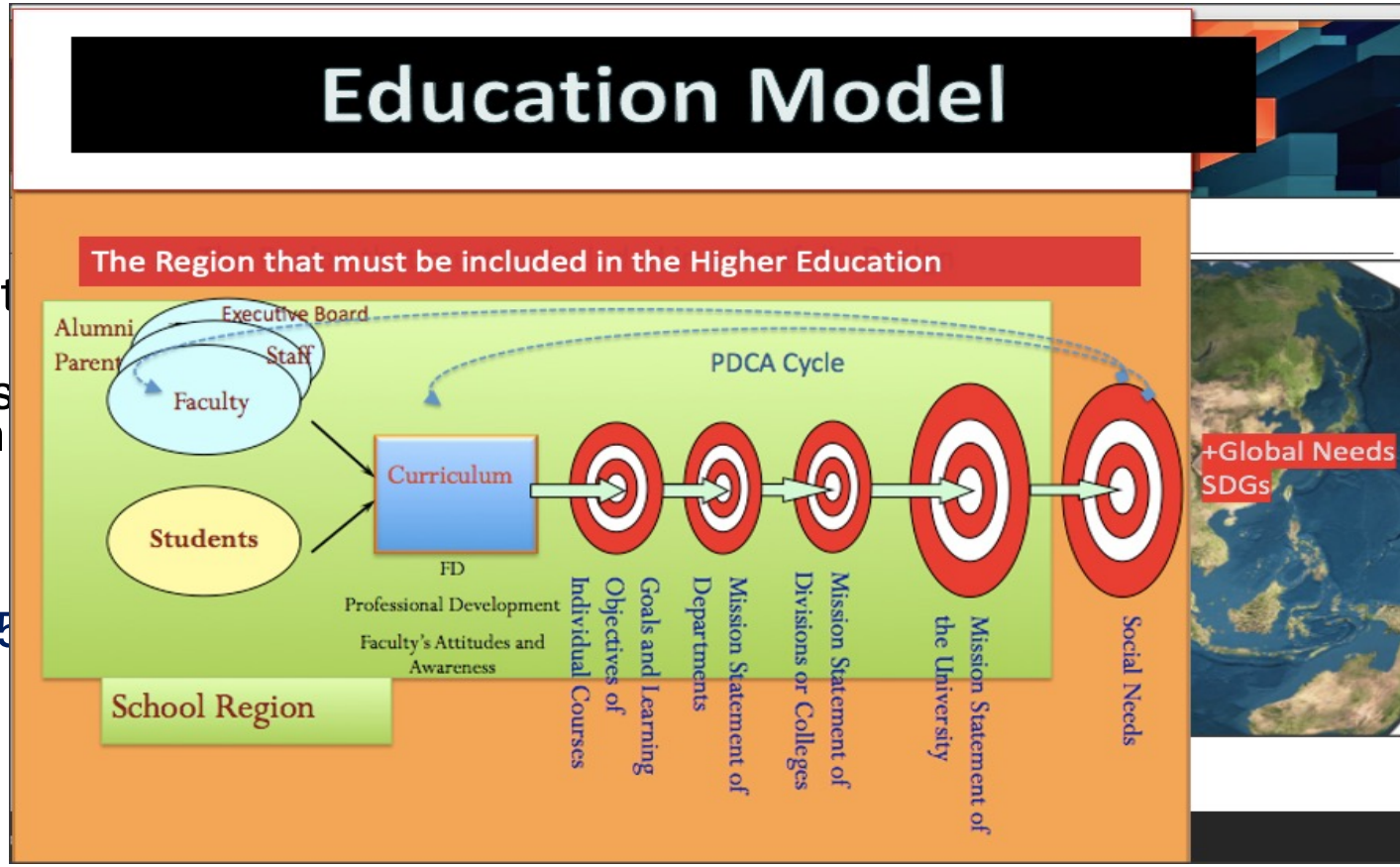
- Global Needs in the Future Society
- Authentic Assess-ment in the Authen-tic Curriculum

- New Education Normal
  - Singularity (2045)-Ready



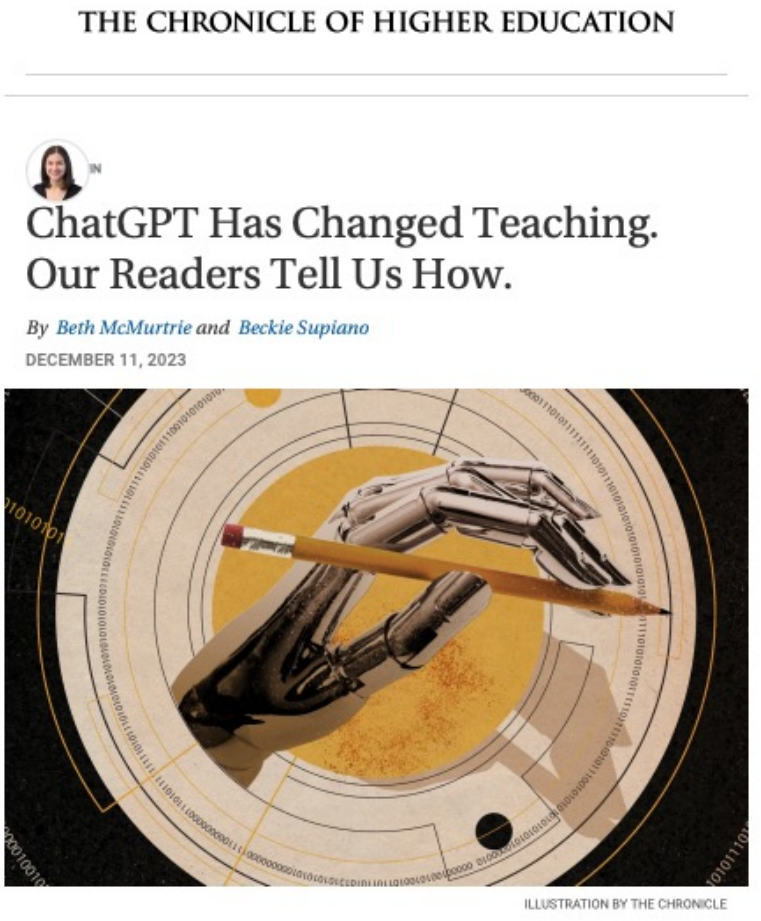
How do you define authentic assessments

- In order to be authentic in Edu,
- Education Model must reflect:
  - Global Needs in t Future Society
  - Authentic Assess ment in the Auth tic Curriculum
  - New Education Normal
  - Singularity (2045 Ready



Coping with the advancement of Technology

Pros and Cons Innovative – Non-Innovative



THE CHRONICLE OF HIGHER EDUCATION

ChatGPT Has Changed Teaching. Our Readers Tell Us How.

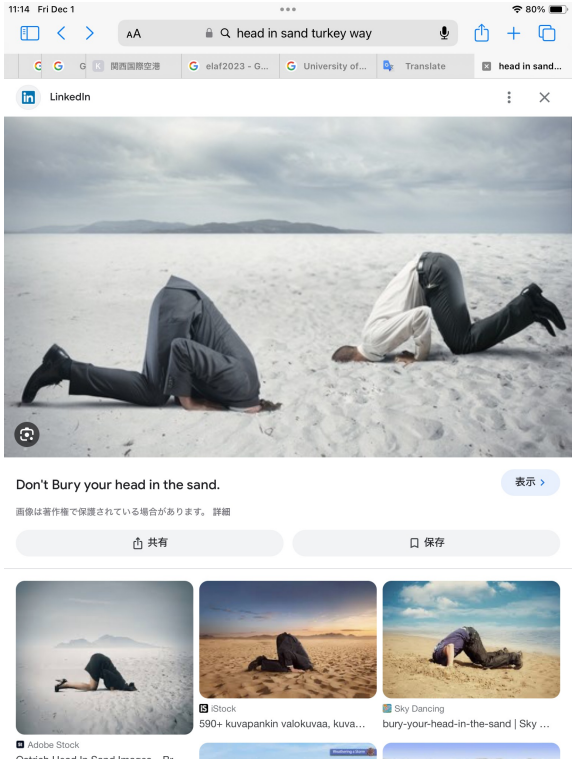
By Beth McMurtrie and Beckie Supiano

DECEMBER 11, 2023

ILLUSTRATION BY THE CHRONICLE

Be aware! chatGPT is coming!

Be aware! chatGPT is coming!

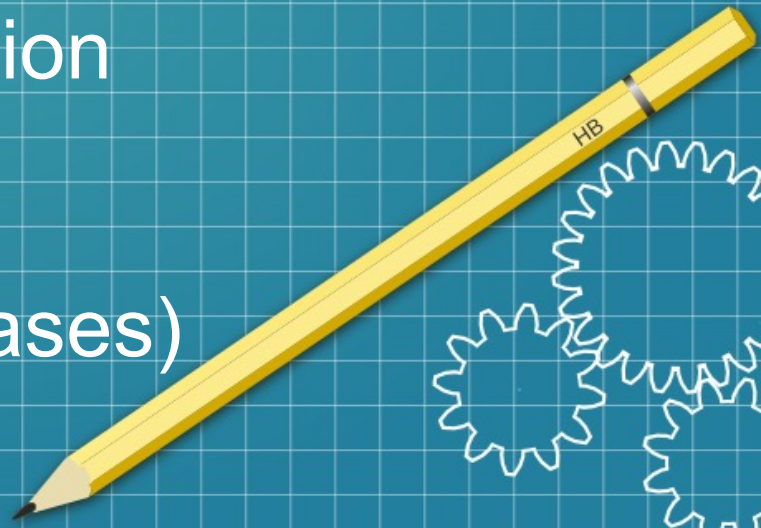


Main Body

Outline

Education Informatics in the New Normal

- (i) Be Authentic! - Facts around Education
- (ii) Journey to Authentic Education
- (iii) Future Skills
- (iv) Authentic Learning (Showcases)



Outline

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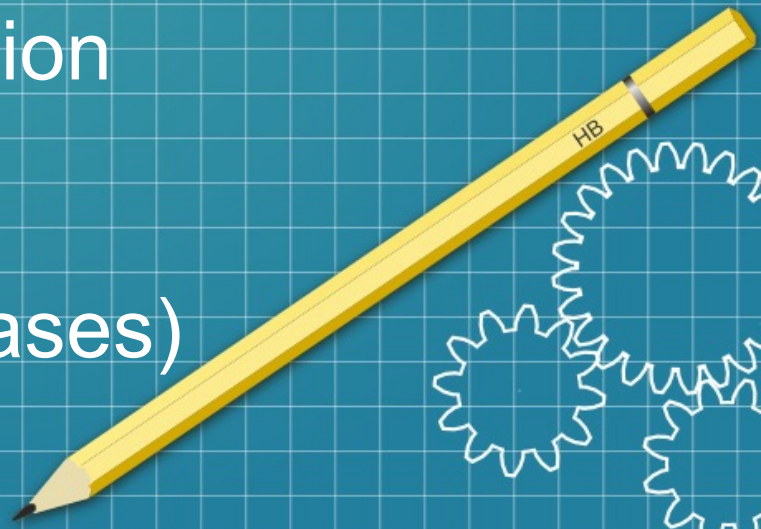
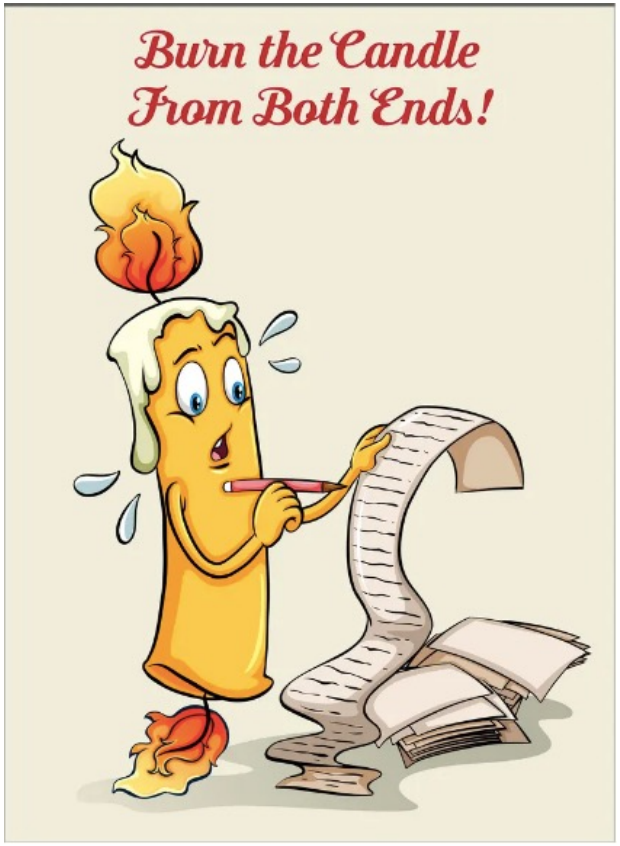


Burning both ends of a candle . . .



https://www.vectorstock.com/royalty-free-vector/burning-the-candle-from-both-ends-vector-3965807

【Let's Start from here!】

- Is that true?

- What is the Mission of Education ?

【For students, college life is …】

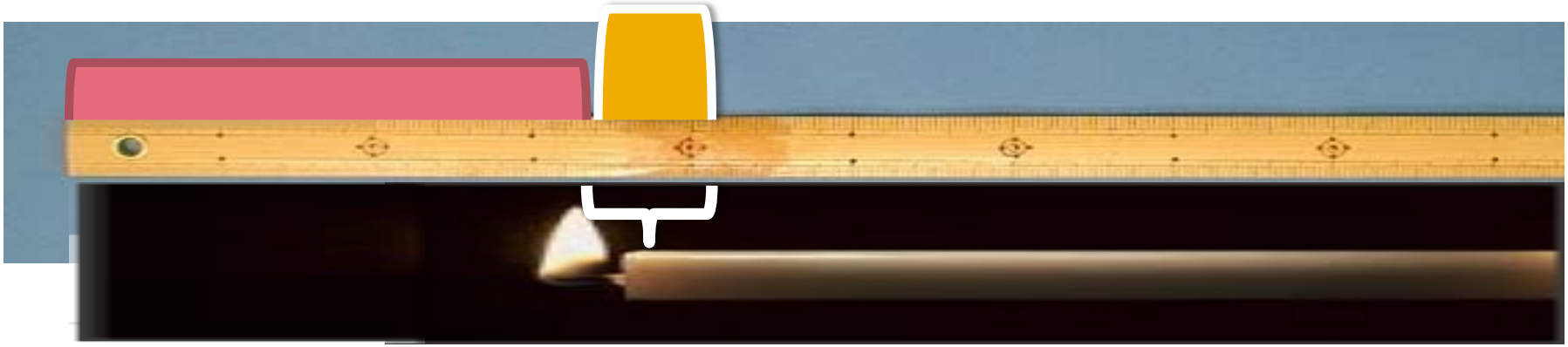
- Let's compare a human life to a 100 cm candle!

http://static.guim.co.uk/sys-images/Guardian/Pix/pictures/2011/12/2/1322842015357/Candle-007.jpg

http://d28xhcgddm1buq.cloudfront.net/product-images/white-10-formal-taper-dinner-candle-4.jpg

【For the students, college life is …】

- １８～２２cm：　4 Years of College Education



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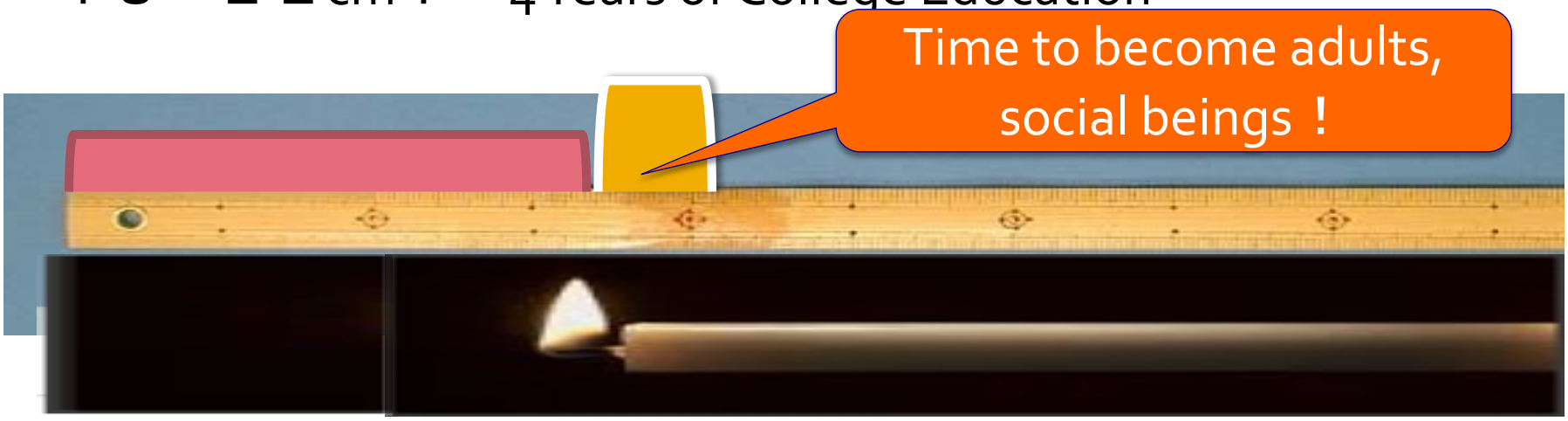

【For the students, college life is …】

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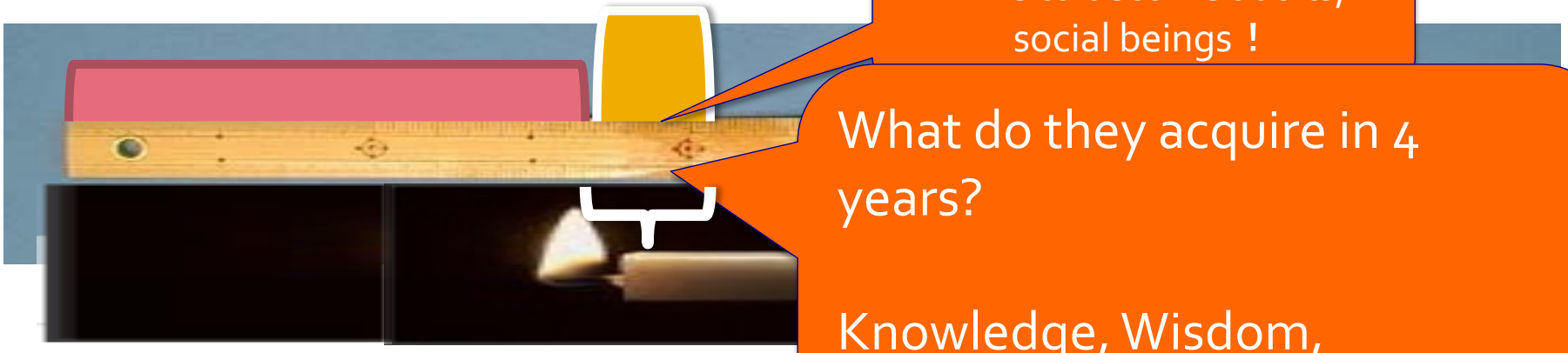


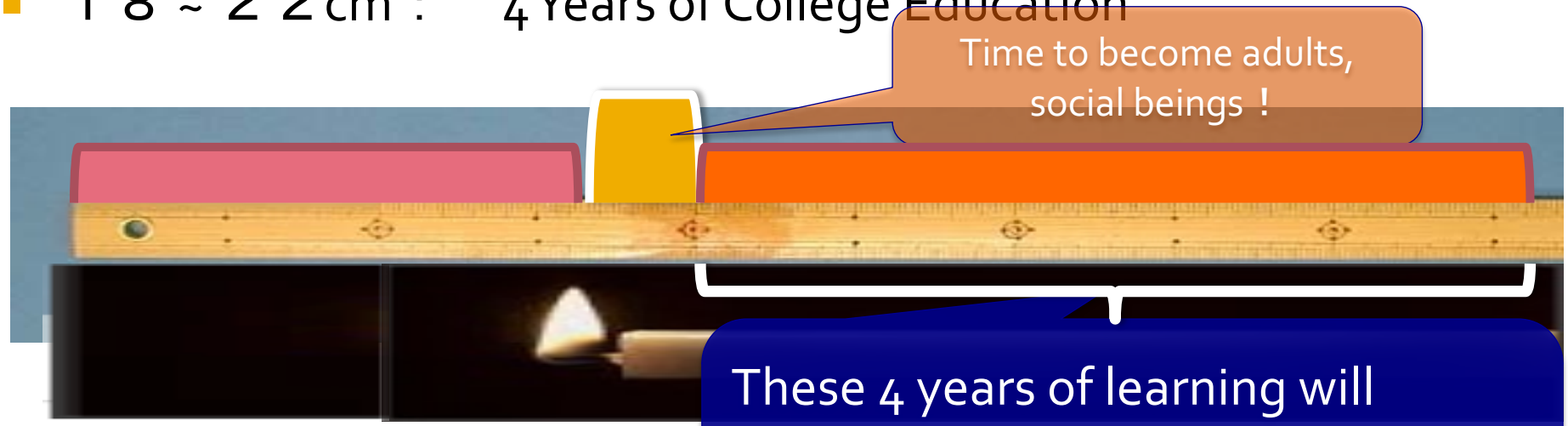
Time to become adults, social beings！

What do they acquire in 4 years?

Knowledge, Wisdom, Competencies, Skills to become Social beings.

【For the students, college life is …】

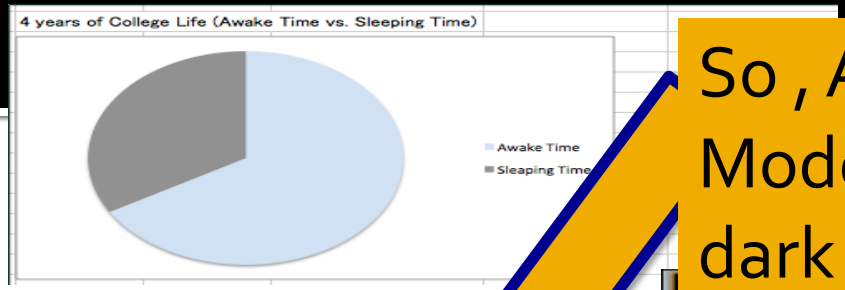
- １８～２２cm：　4 Years of College Education



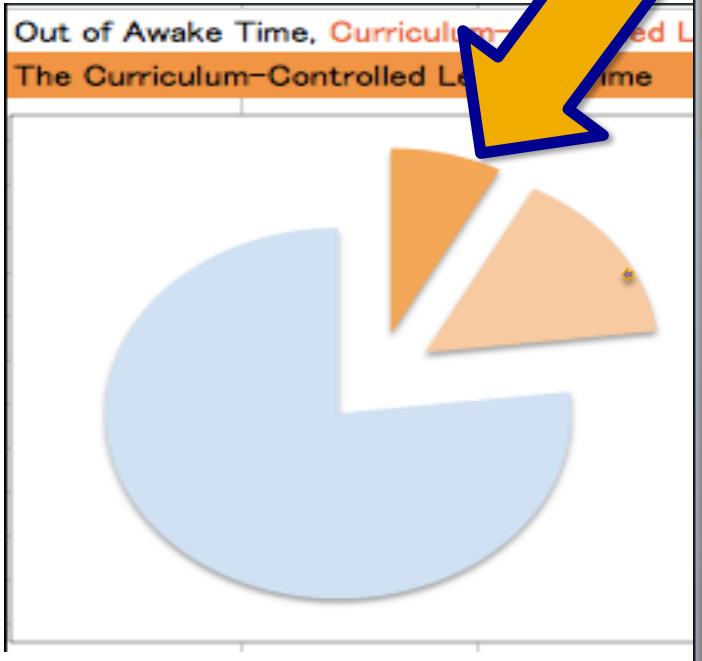
4 Years of Education means . . .
Actually Speaking

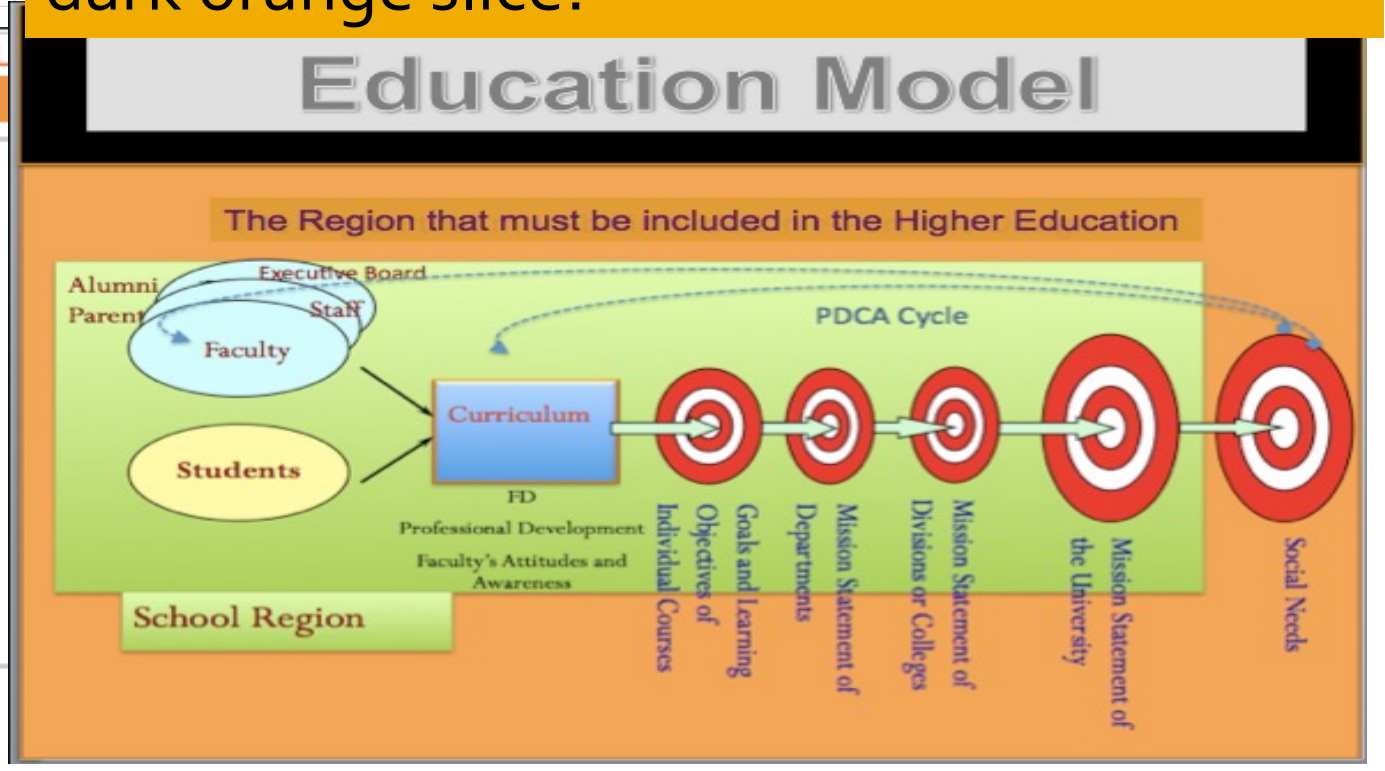
- 4 Years = 48 months { 365 days * 24 hours (= 8,760 hours) * 4 years}= **35,040 hours**
  - **2/3 ----- awake**, 1/3 ------- sleeping
  - **23,360 hours ---- active** , 11,680 hours ----- being idle
  - 130 ~ 220 credit hours for in-class learning ---- only **1/10th ~1/11th of the waking hours**.
- Our students spend 10 times more outside the class!

Visually Speaking . . .



So , Are we talking about the educational Model (In-Class Face-to-Face) for the small dark orange slice?





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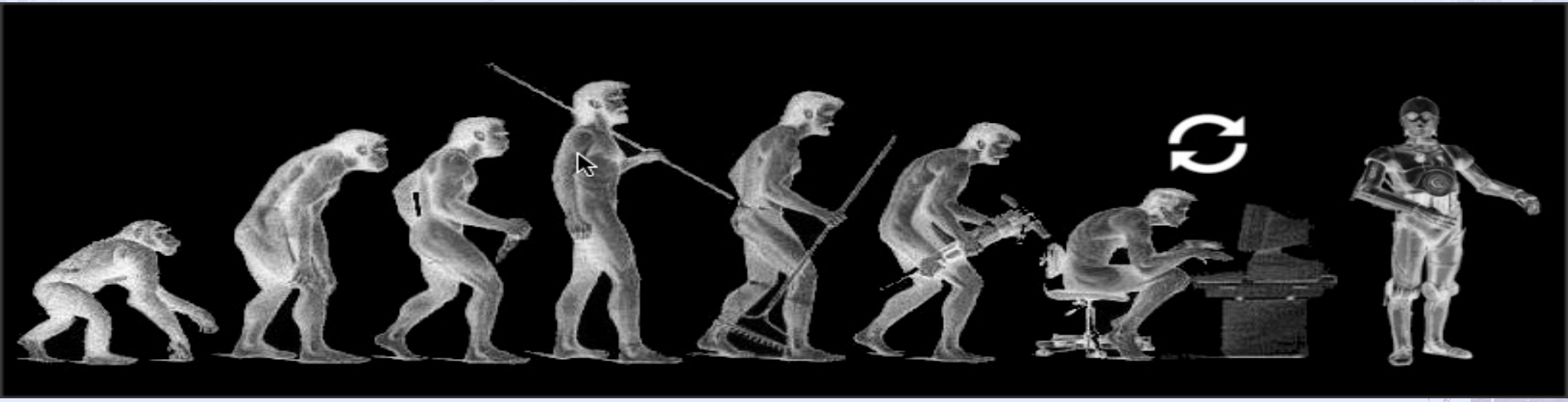
Furthermore . . .

Job Market Dynamics

- Singularity (2045) → New Job Market?



How old will your students be in 2045?

https://joneljuste.files.wordpress.com/2015/04/singularity-c3po.jpg

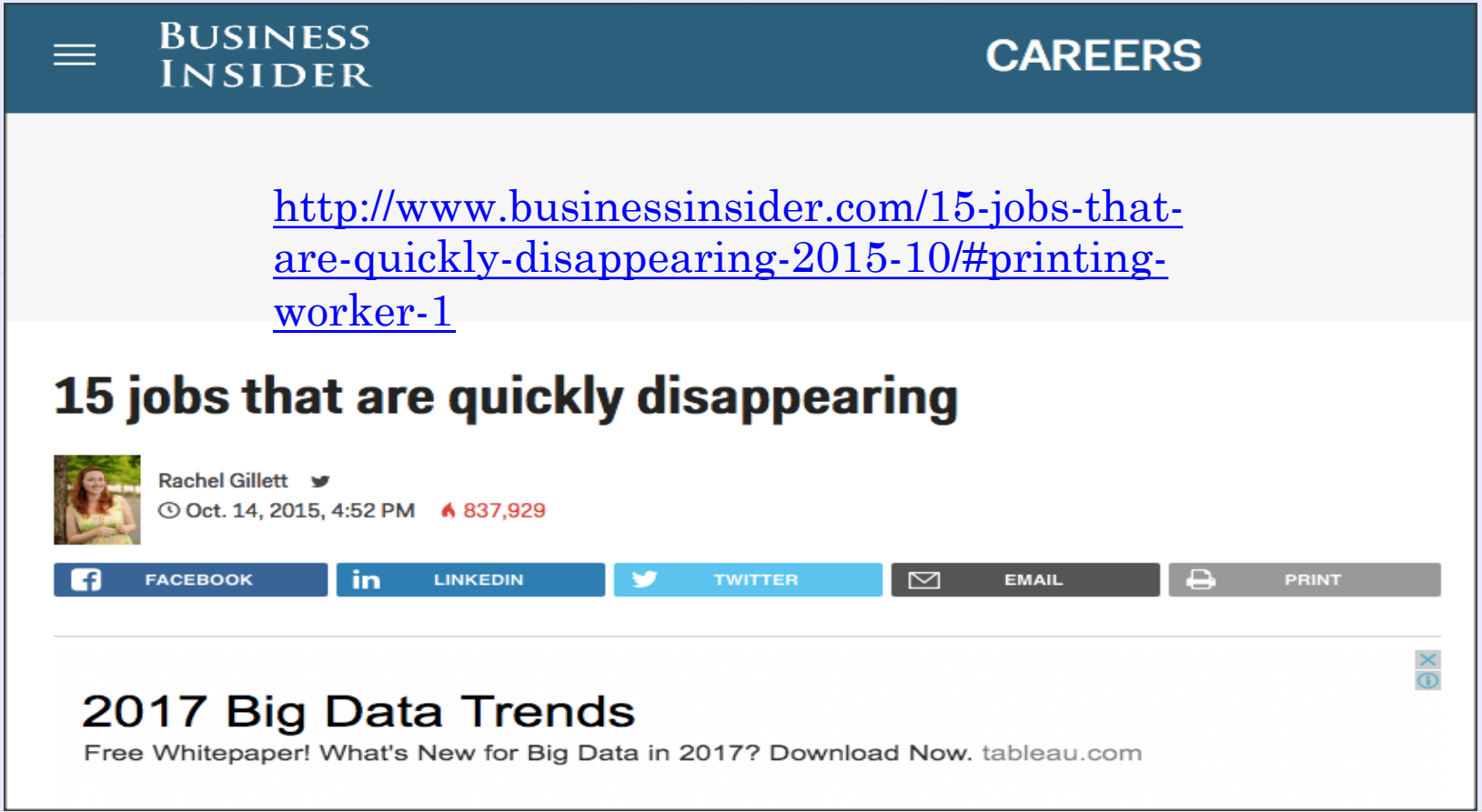
Disappearing Jobs

47% of Jobs Will Disappear in the next 25 Years, According to Oxford University

December 27, 2016 by PHILIP PERRY

http://bigthink.com/philip-perry/47-of-jobs-in-the-next-25-years-will-disappear-according-to-oxford-university

Disappearing Jobs and Reasons



https://jp.reuters.com/article/mizuho-restructuring-idJPKBN1CX07R

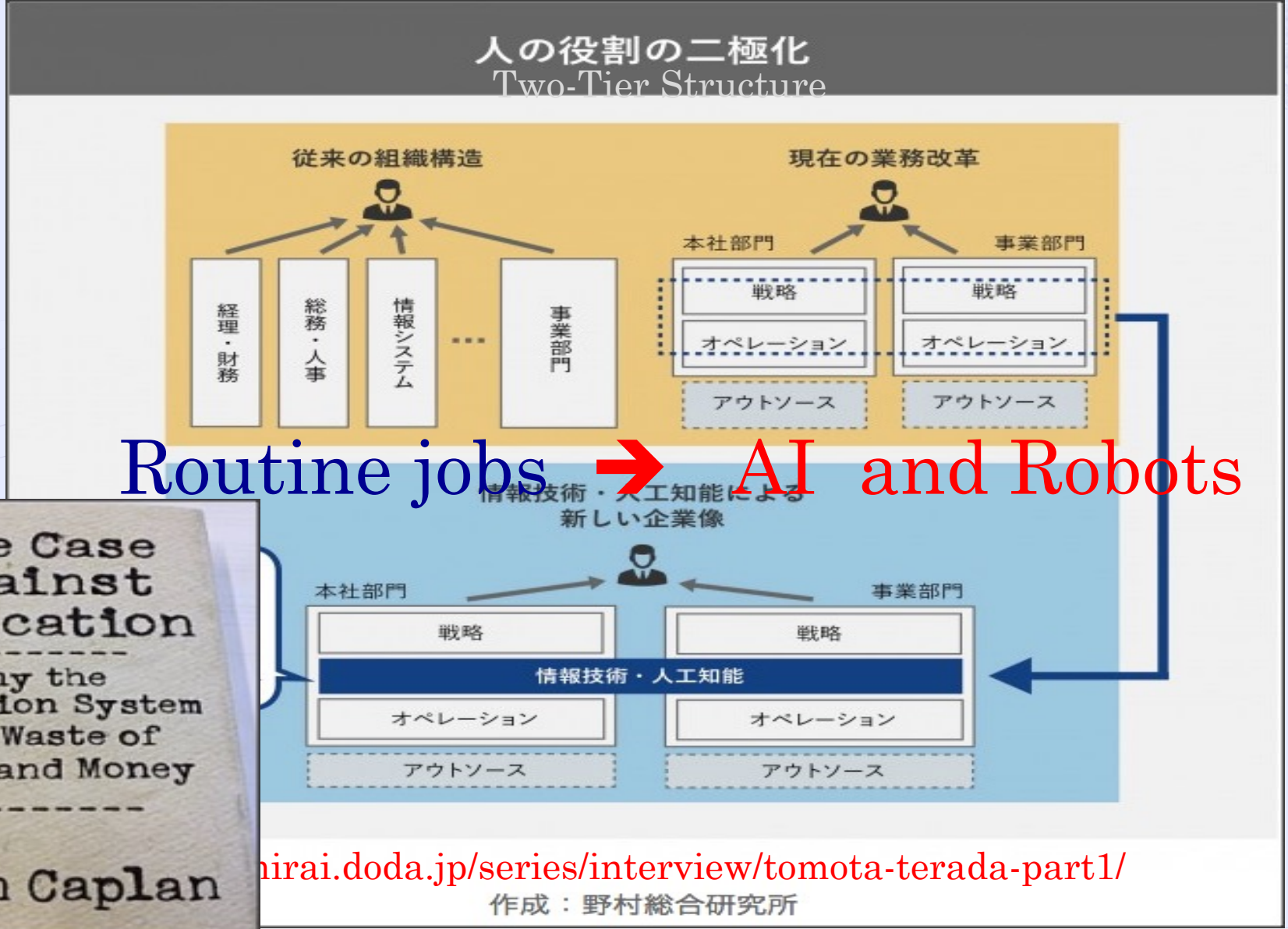
Happened Recently

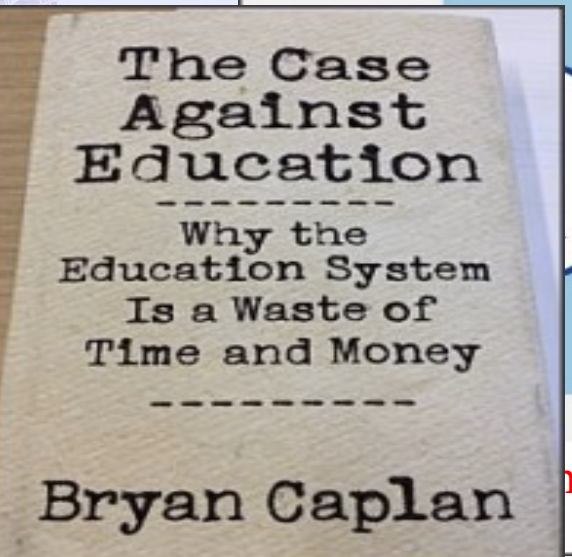
One of the major banks in Japan

みずほ、10年間で1.9万人削減検討　IT や店舗統廃合で＝関係筋

19,000 bank employees will lose their jobs!

［東京　２８日　ロイター］ - みずほフィナンシャルグループ(8411.T)は、今後１０年間で１万９０００人を削減し、現状の約６万人から４万人規模に移行する検討に入った。ＩＴ活用による業務効率化や、店舗の統廃合を進める方針だ。


人の役割の二極化
Two-Tier Structure
従来の組織構造
経理・財務
総務・人事
情報システム
…
事業部門
現在の業務改革
本社部門
事業部門
戦略
オペレーション
アウトソース
戦略
オペレーション
アウトソース
Routine jobs → AI and Robots
新しい企業像
本社部門
事業部門
戦略
情報技術・人工知能
オペレーション
アウトソース
戦略
オペレーション
アウトソース
mirai.doda.jp/series/interview/tomota-terada-part1/
作成：野村総合研究所


The Case Against Education
Why the Education System Is a Waste of Time and Money
Bryan Caplan

JOB MARKET IN THE FUTURE

bc.com/news/technology-30290540

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Technology

Stephen Hawking warns artificial intelligence could end mankind

By Rory Cellan-Jones
Technology correspondent

2 December 2014 | Technology | Share

ggest threat facing mankind is
in some ways only just been
rtificial intelligence (AI). The
hen Hawking has said that AI
'a real danger' in the 'not-too-
re. Hawking added that 'the
omputers develop intelligence
and take over. Humans, who are limited by
slow biological evolution, couldn't compete,

http://www.bbc.com/news/technology-30290540

http://www.spiked-online.com/newsite/article/the-robots-are-not-taking-over/16299#.WgJmDmKCzdc

Stephen Hawking

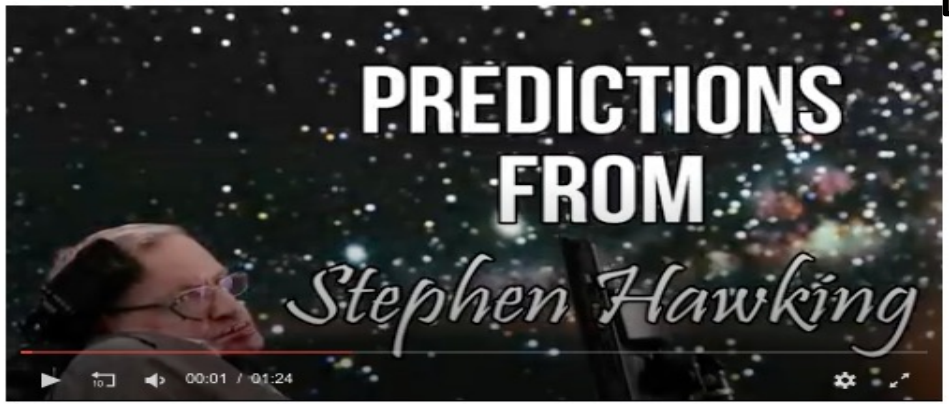
U.S. EDITION Tue, Nov 07, 2017 Newsweek SIGN IN SUBSCRIBE >

http://www.newsweek.com/stephen-hawking-artificial-intelligence-warning-destroy-civilization-703630

amazon.co.jp

STEPHEN HAWKING AI WARNING: ARTIFICIAL INTELLIGENCE COULD DESTROY CIVILIZATION

BY HANNAH OSBORNE ON 11/7/17 AT 4:43 AM



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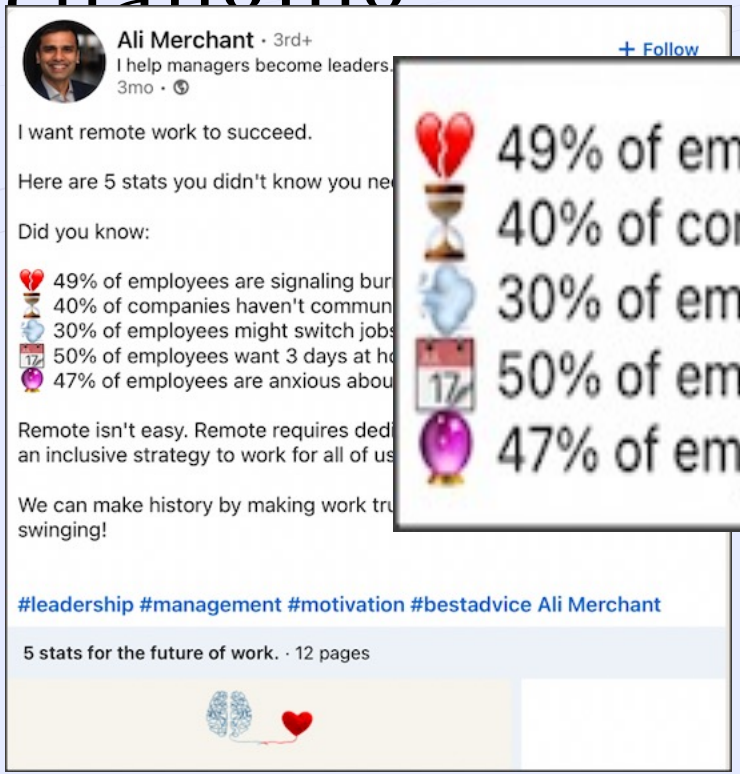
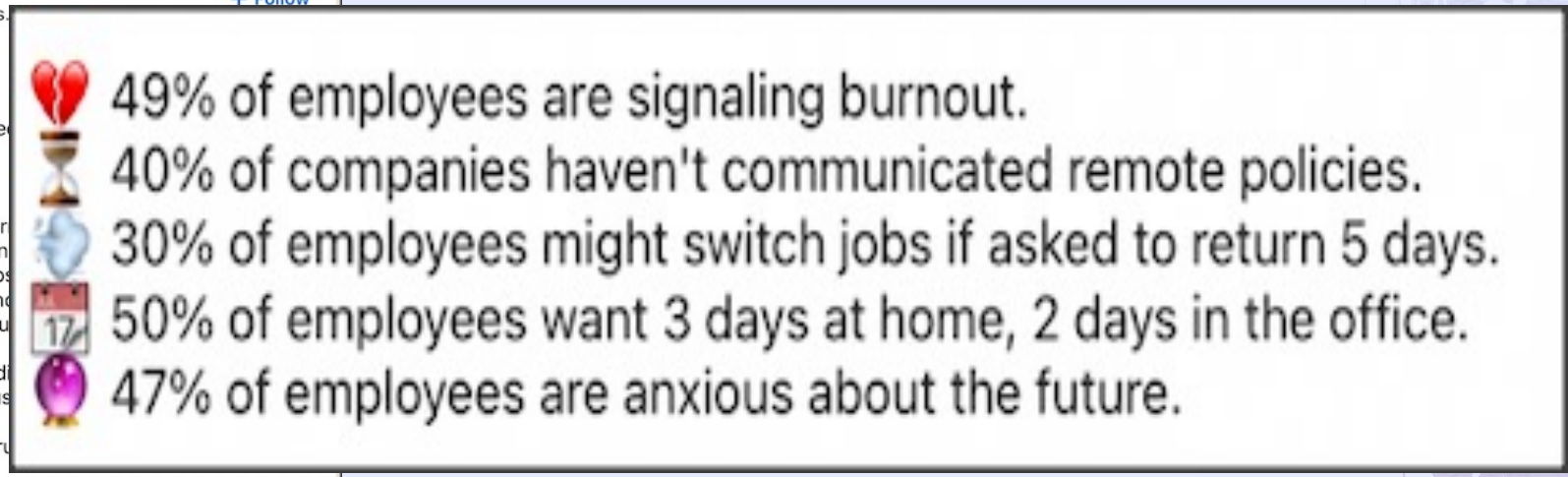
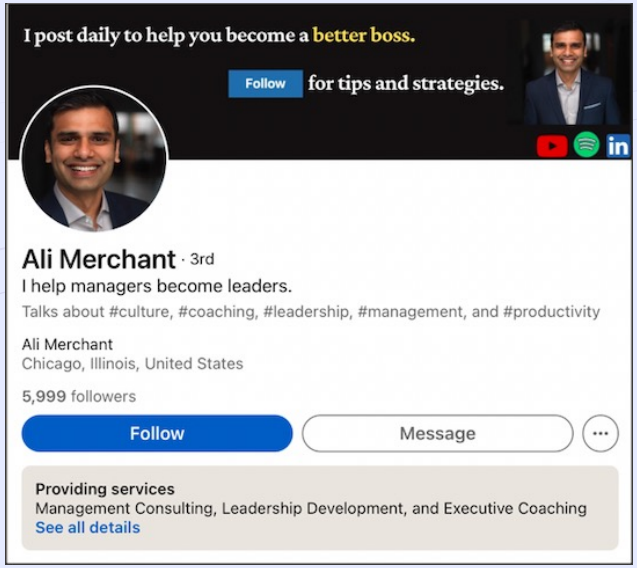
During a year and a half in the Pandemic, employees' mindset has been changing






I post daily to help you become a better boss.
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I help managers become leaders.
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Management Consulting, Leadership Development, and Executive Coaching
See all details

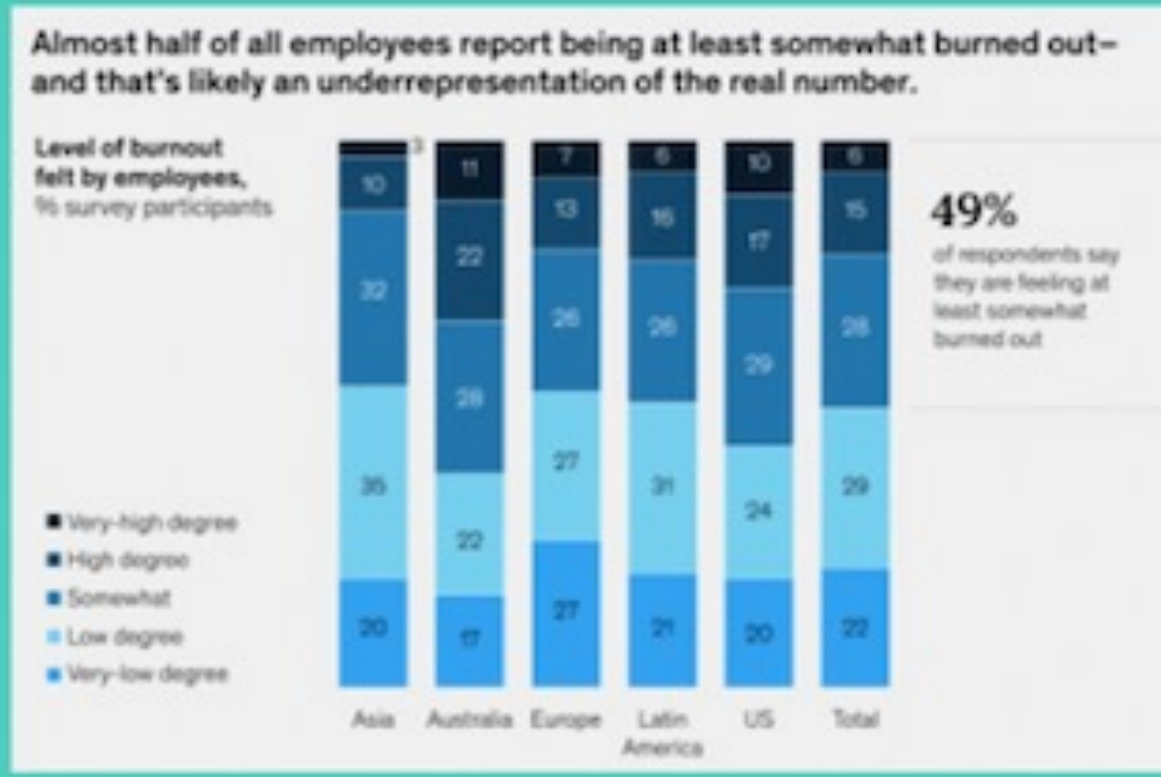
5 DATA POINTS YOU NEED TO KNOW ABOUT REMOTE WORK
AM

5 DATA POINTS YOU NEED TO KNOW ABOUT REMOTE WORK

AM

49% OF YOUR EMPLOYEES ARE FEELING SIGNS OF BURNOUT

AM



5 DATA POINTS YOU NEED TO KNOW ABOUT REMOTE WORK

AM

40% OF COMPANIES HAVE YET TO COMMUNICATE REMOTE POLICIES

AM

Most organizations have not clearly communicated a vision for postpandemic work.

Employees that report their organization has communicated a post-pandemic vision,
% survey participants

32 Well communicated

28 Vaguely communicated

40 Not communicated

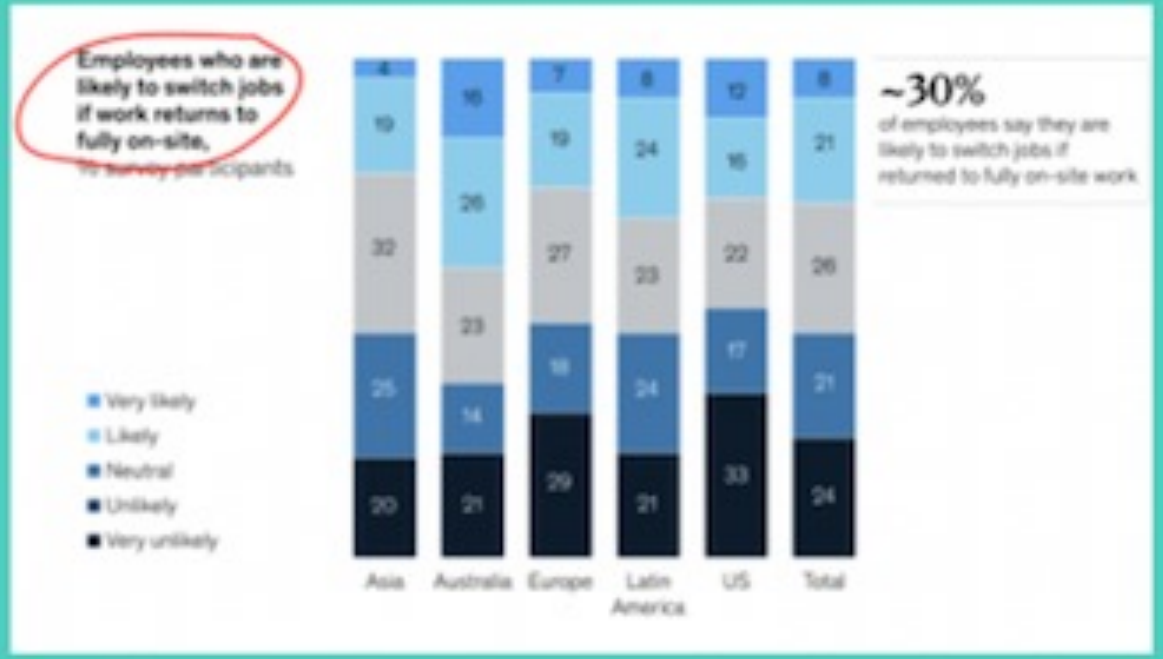
AM

5 DATA POINTS YOU NEED TO KNOW ABOUT REMOTE WORK

AI

30% MIGHT SWITCH JOBS IF REQUIRED TO RETURN FULL TIME.

AI

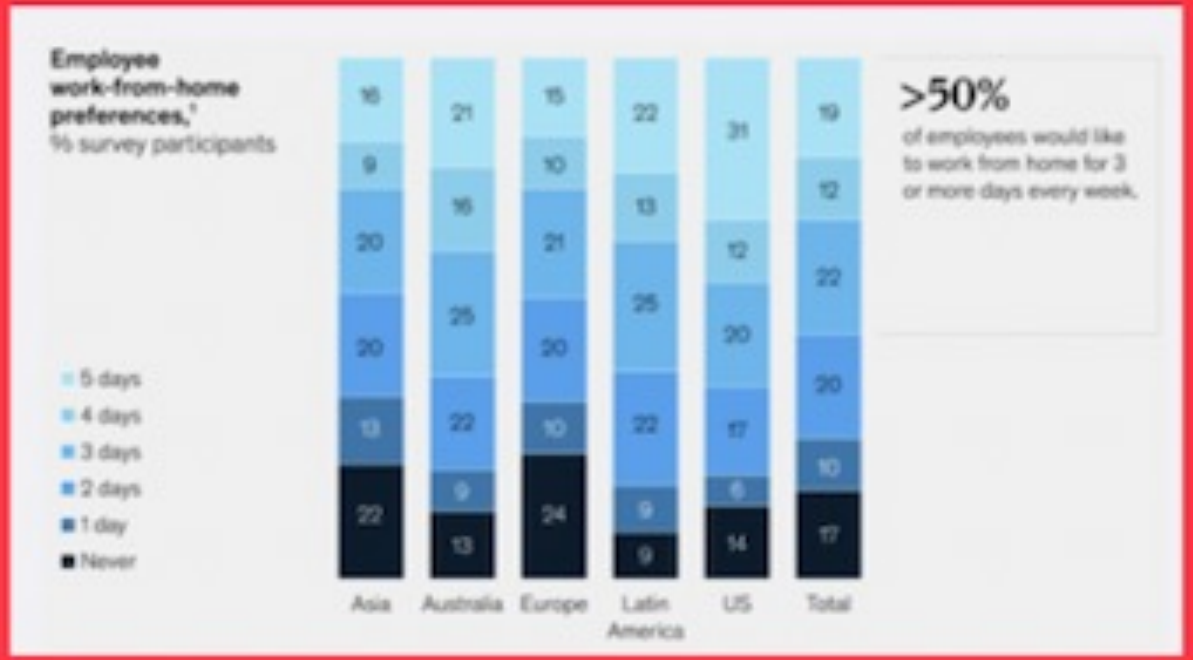


5 DATA POINTS YOU NEED TO KNOW ABOUT REMOTE WORK

AM

50% EMPLOYEES WANT 3 DAYS AT HOME.

AM

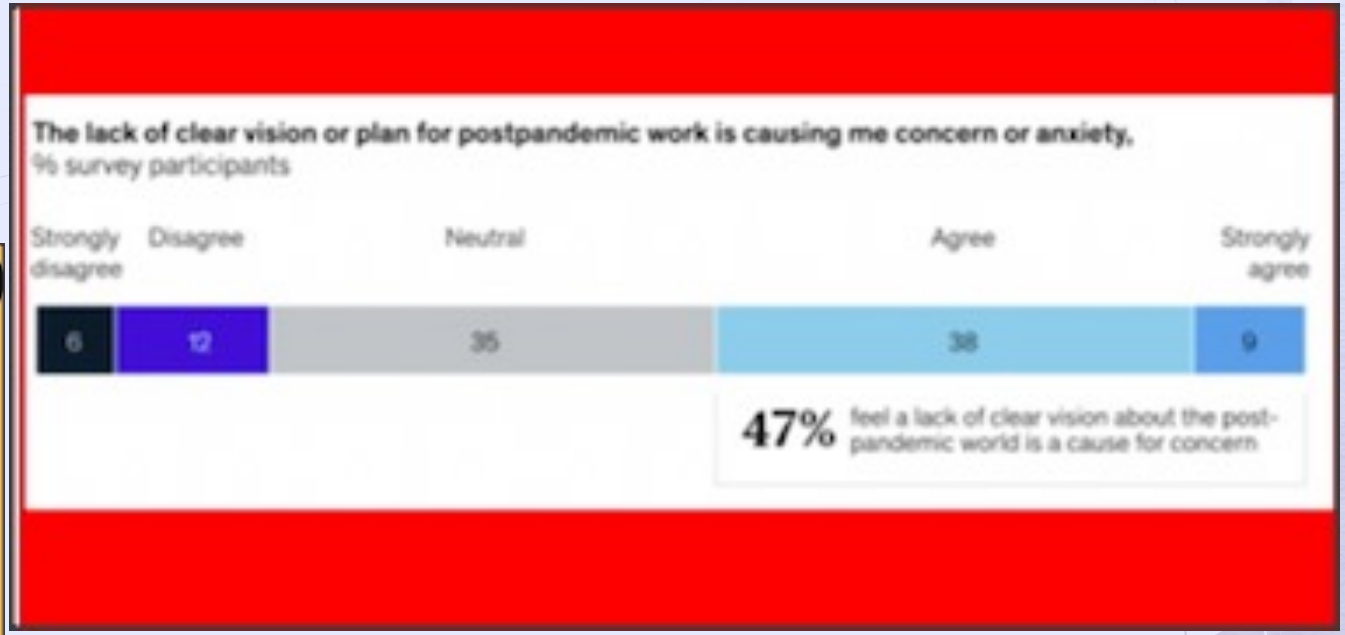


5 DATA POINTS YOU NEED TO KNOW ABOUT REMOTE WORK

AI

47% EMPLOYESS ARE ANXIOUS ABOUT THE FUTURE.

AI



Good reference:

- https://guthriejensen.com/blog/future-of-work-statistics-infographic/

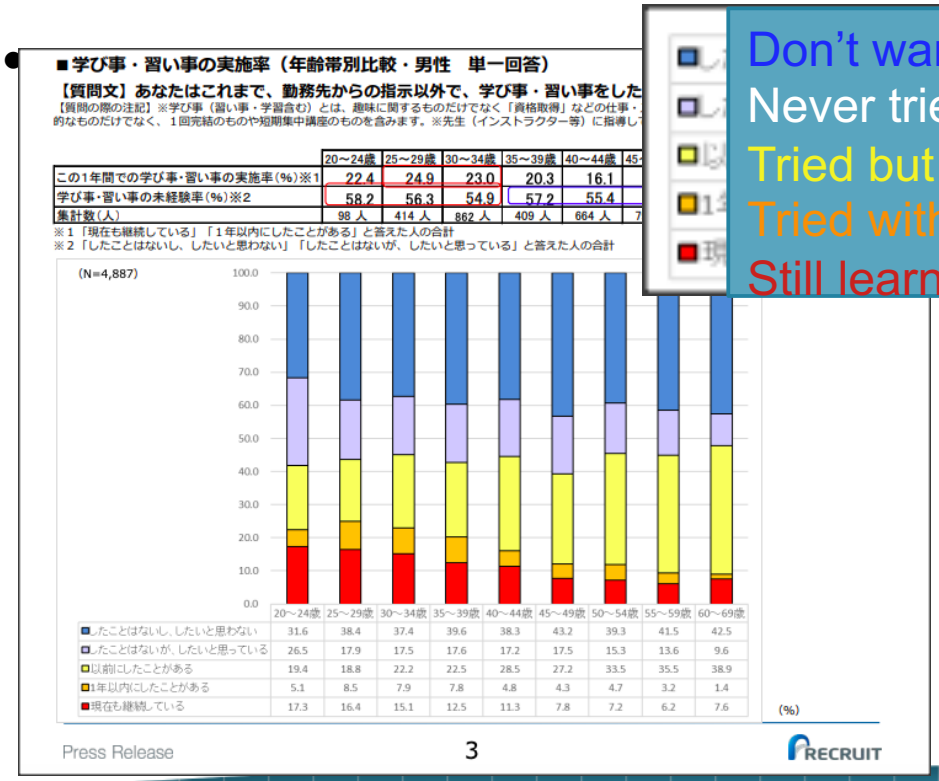
Evidence from Data Science

- Lifelong Learning Mindset

Lifelong Learning Mindset

- https://www.recruit-mp.co.jp/news/180330_01.pdf

Don’t want to learn anything
Never tried. Maybe later
Tried but failed
Tried within a year
Still learning


■学び事・習い事の実施率（年齢帯別比較・男性　単一回答）

【質問文】あなたはこれまで、勤務先からの指示以外で、学び事・習い事をした

【質問の際の注記】※学び事（習い事・学習含む）とは、趣味に関するものだけでなく「資格取得」などの仕事・的なものだけでなく、１回完結のものや短期集中講座のものを含みます。※先生（インストラクター等）に指導し

	20～24歳	25～29歳	30～34歳	35～39歳	40～44歳	45～
この1年間での学び事・習い事の実施率(%)※1	22.4	24.9	23.0	20.3	16.1	
学び事・習い事の未経験率(%)※2	58.2	56.3	54.9	57.2	55.4	
集計数(人)	98 人	414 人	862 人	409 人	664 人	7

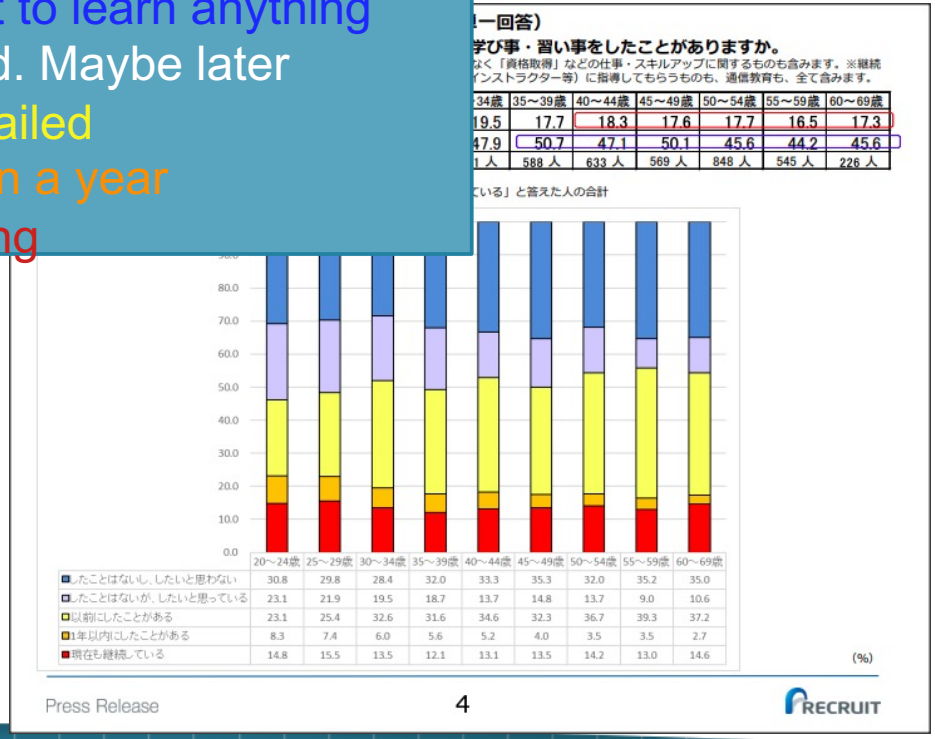
※1「現在も継続している」「１年以内にしたことがある」と答えた人の合計
※2「したことはないし、したいと思わない」「したことはないが、したいと思っている」と答えた人の合計

(N=4,887)

	20～24歳	25～29歳	30～34歳	35～39歳	40～44歳	45～49歳	50～54歳	55～59歳	60～69歳
したことはないし、したいと思わない	31.6	38.4	37.4	39.6	38.3	43.2	39.3	41.5	42.5
したことはないが、したいと思っている	26.5	17.9	17.5	17.6	17.2	17.5	15.3	13.6	9.6
以前にしたことがある	19.4	18.8	22.2	22.5	28.5	27.2	33.5	35.5	38.9
1年以内にしたことがある	5.1	8.5	7.9	7.8	4.8	4.3	4.7	3.2	1.4
現在も継続している	17.3	16.4	15.1	12.5	11.3	7.8	7.2	6.2	7.6

(%)

Press Release 3 RECRUIT


ー回答）
学び事・習い事をしたことがありますか。
なく「資格取得」などの仕事・スキルアップに関するものも含みます。※継続
インストラクター等）に指導してもらうものも、通信教育も、全て含みます。

	34歳	35～39歳	40～44歳	45～49歳	50～54歳	55～59歳	60～69歳
	19.5	17.7	18.3	17.6	17.7	16.5	17.3
	47.9	50.7	47.1	50.1	45.6	44.2	45.6
	1 人	588 人	633 人	569 人	848 人	545 人	226 人

ている」と答えた人の合計

	20～24歳	25～29歳	30～34歳	35～39歳	40～44歳	45～49歳	50～54歳	55～59歳	60～69歳
したことはないし、したいと思わない	30.8	29.8	28.4	32.0	33.3	35.3	32.0	35.2	35.0
したことはないが、したいと思っている	23.1	21.9	19.5	18.7	13.7	14.8	13.7	9.0	10.6
以前にしたことがある	23.1	25.4	32.6	31.6	34.6	32.3	36.7	39.3	37.2
1年以内にしたことがある	8.3	7.4	6.0	5.6	5.2	4.0	3.5	3.5	2.7
現在も継続している	14.8	15.5	13.5	12.1	13.1	13.5	14.2	13.0	14.6

(%)

Press Release 4 RECRUIT

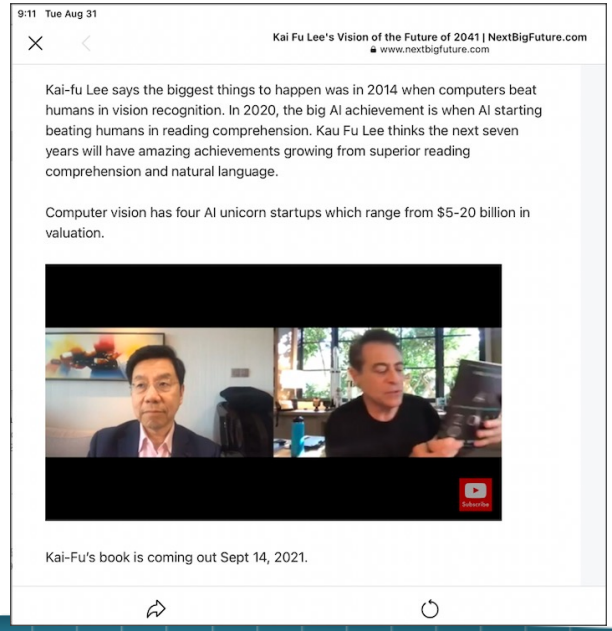
Lifelong Learning Mindset

- https://www.recruit-mp.co.jp/news/180330_01.pdf
-

Which means . . .

- No such scenario for career life!

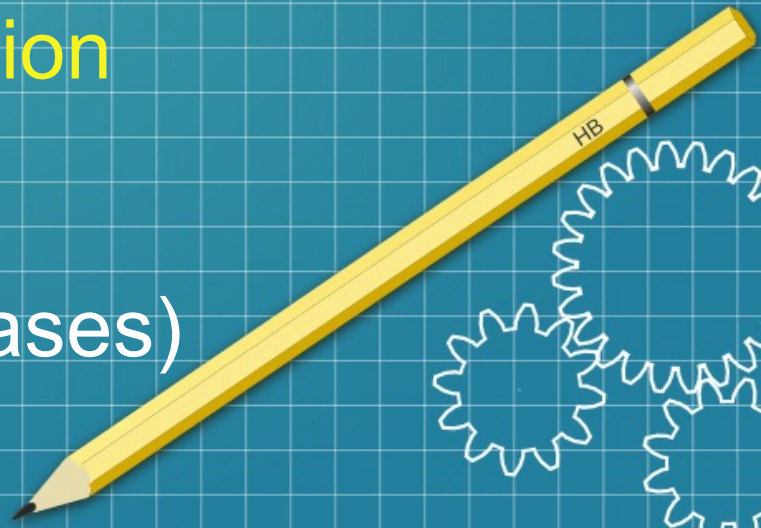
  Singularity(2045) → Lay off (47%) → Relocation (Re-Training Program) →?



Outline

Education Informatics in the New Normal

- (i) Be Authentic! - Facts around Education
- (ii) Journey to Authentic Education
- (iii) Future Skills
- (iv) Authentic Learning (Showcases)



What needs to be included in Authentic Education?

- Education Model
- Bloom’s Taxonomy Matrix
- Future Skills Defined!
- Showcases

EDUCATIONAL MODEL

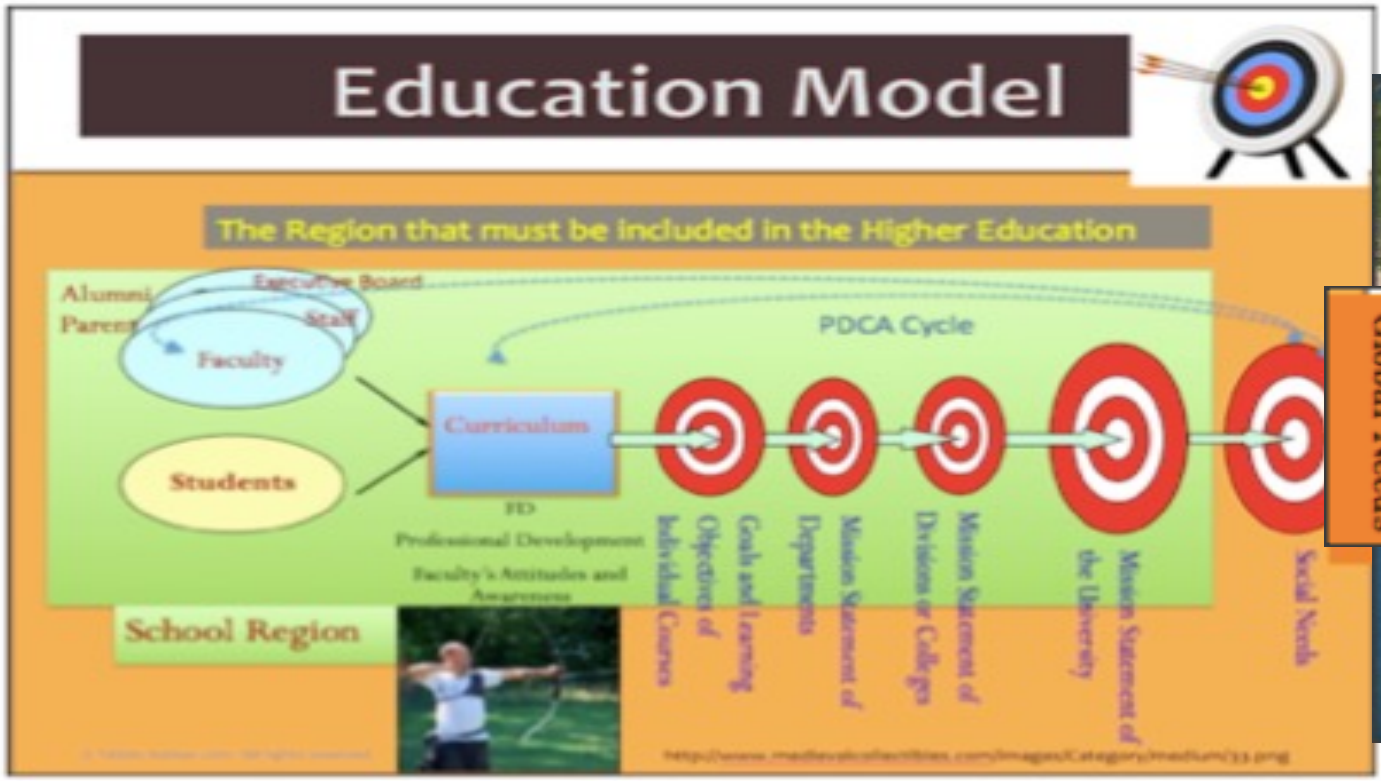


Figure 1. ABET Educational Model

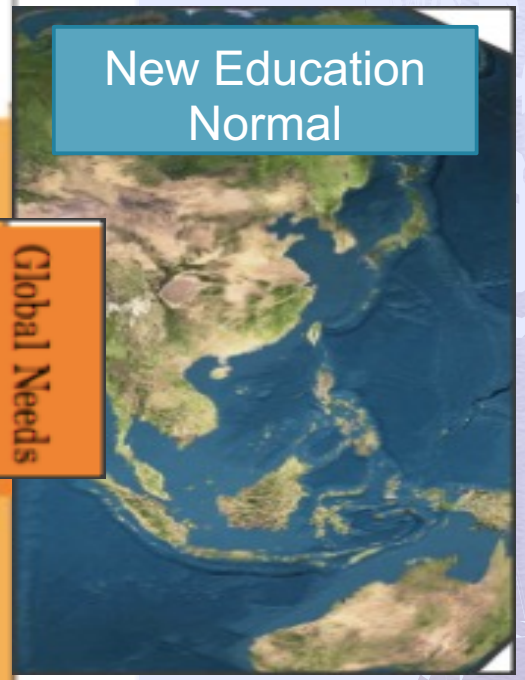
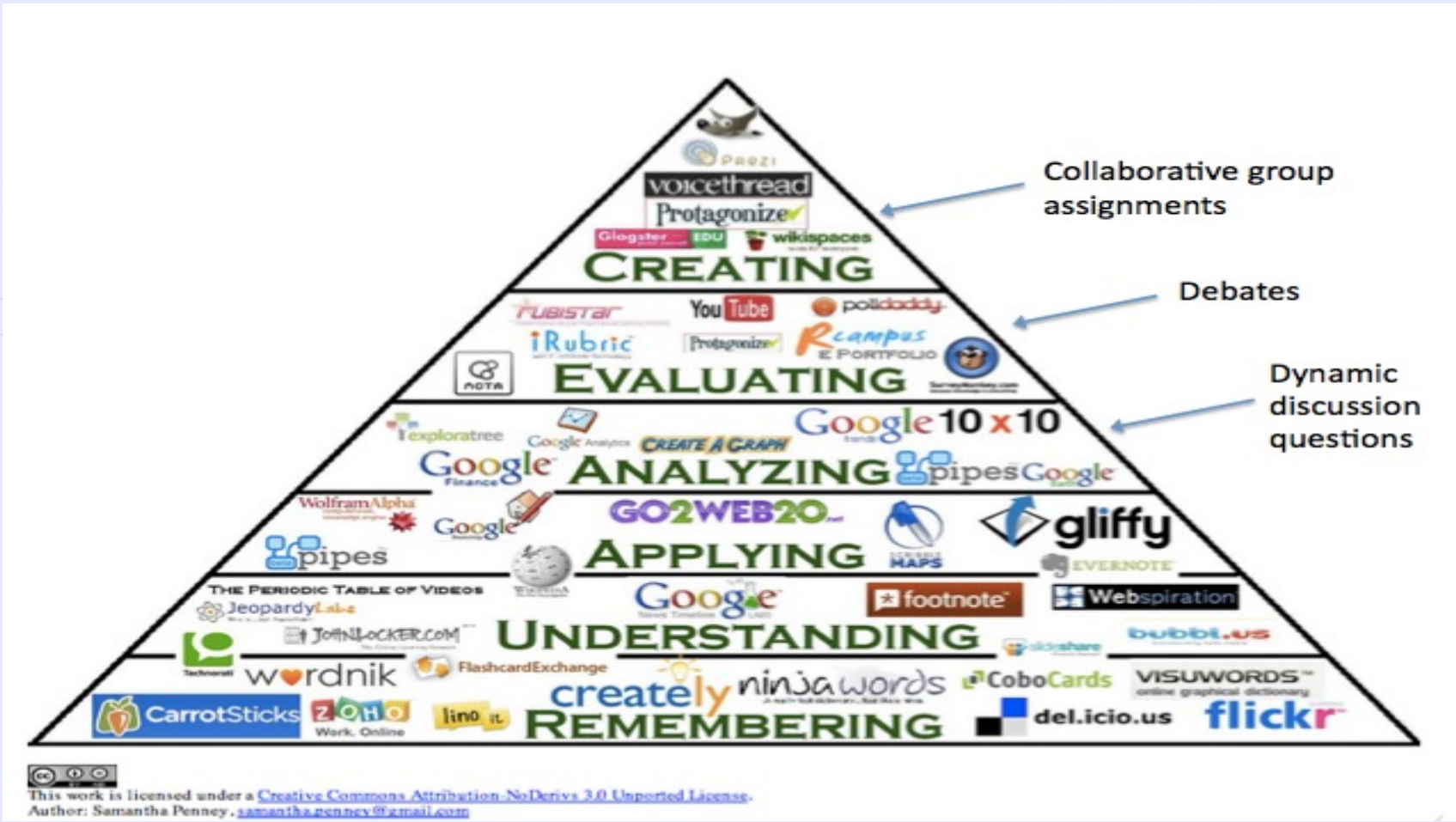


Image source: google.com

			The Cognitive Process Dimension					
			Activities by Learners					
			Passive Learning		Active Learing			
			Remember	Understand	Apply	Analyze	Evaluate	Create
			(knowledge)	(Comprehension)	(Application)	(Analysis)	(Evaluation)	(Synthesis)
The Knowledge Dimension	What is offered to learners	Factual						
		Conceptual						
		Procedural						
		Meta-Cognitive						

Bloom's Taxonomy enhanced with ICT

http://catlintucker.com/wp-content/uploads/2012/04/Blooms-with-notes.png



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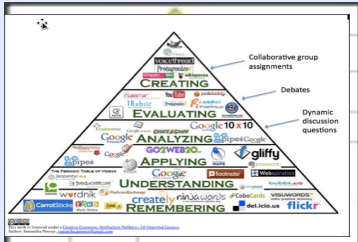
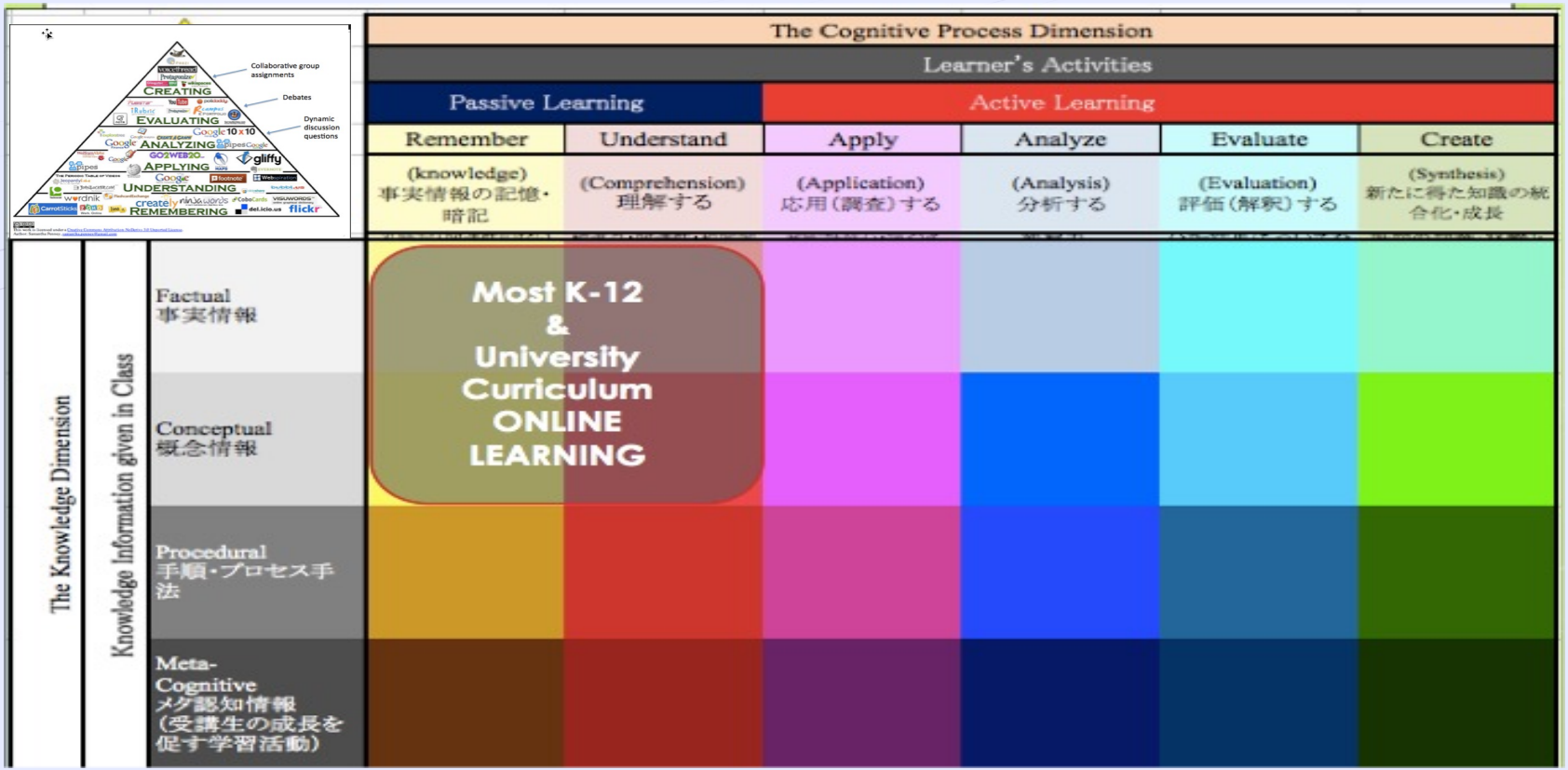
Author: Samantha Penney, samantha.penney@gmail.com

REALM OF ACTIVE LERNING

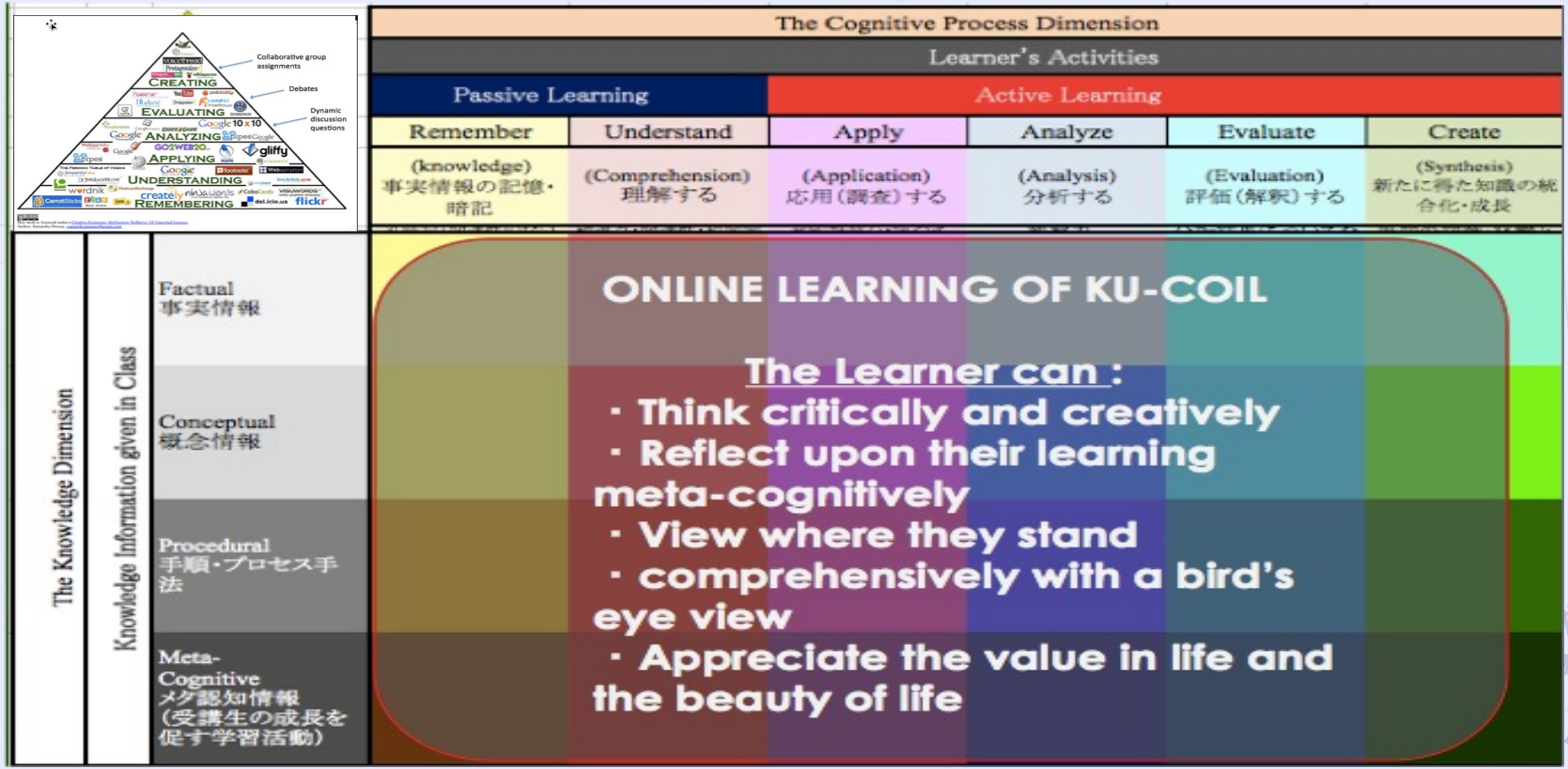


			The Cognitive Process Dimension					
			Learner's Activities					
			Passive Learning		Active Learning			
			Remember	Understand	Apply	Analyze	Evaluate	Create
			(knowledge) Rote Memorization of Facts & Retrieval of them	(Comprehension) Comprehending what is memorized	(Application) Application/Investigation/Conducting research	(Analysis) Analyzing results of research	(Evaluation) Evaluating findings/Interpreting results of analysis	(Synthesis) Integrating new knowledge to what is known/ Growing into a new paradigm of knowledge
			Rote Memorization (Momorizing unrelated facts)	Understanding of Differences/Relatedness/Correlation/Causal–Result Relation	Awareness/Intellectual Curiosity Explore the world of unknown Designing Research Steps	Insight to see things Logical Thinking	Causal–Results Thinking/Interpreting Results	Integrating what is already known with new findings/Growth
The Knowledge Dimension	Knowledge Information given in Class	Factual Information						
		Conceptual Information						
		Procedural Information/ Procedural Information						
		Meta-Cognitive Opportunities to Grow						

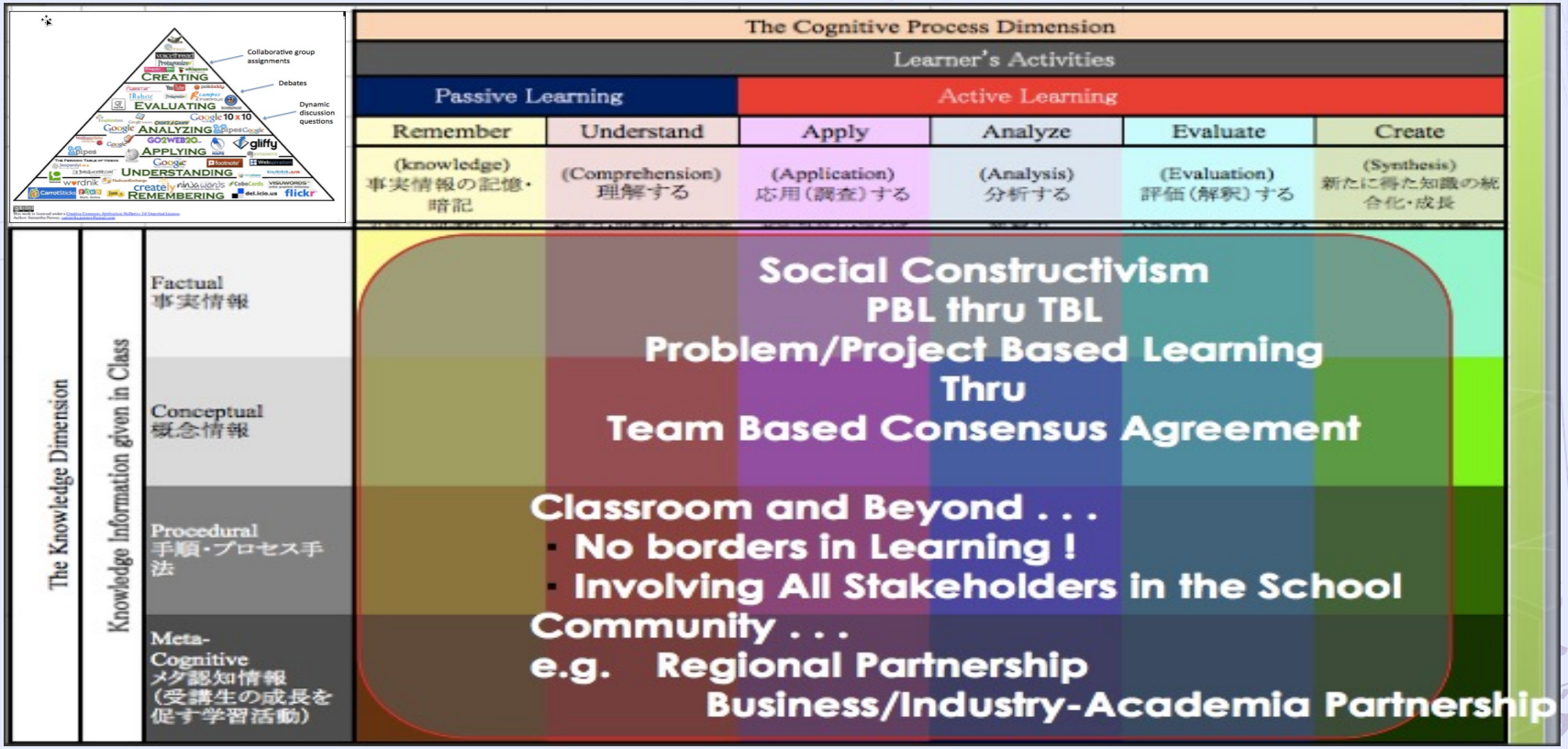
GOING BEYOND TRADITIONAL LEARNING



ACTIVE LEARNING



ACTIVE LEARNING



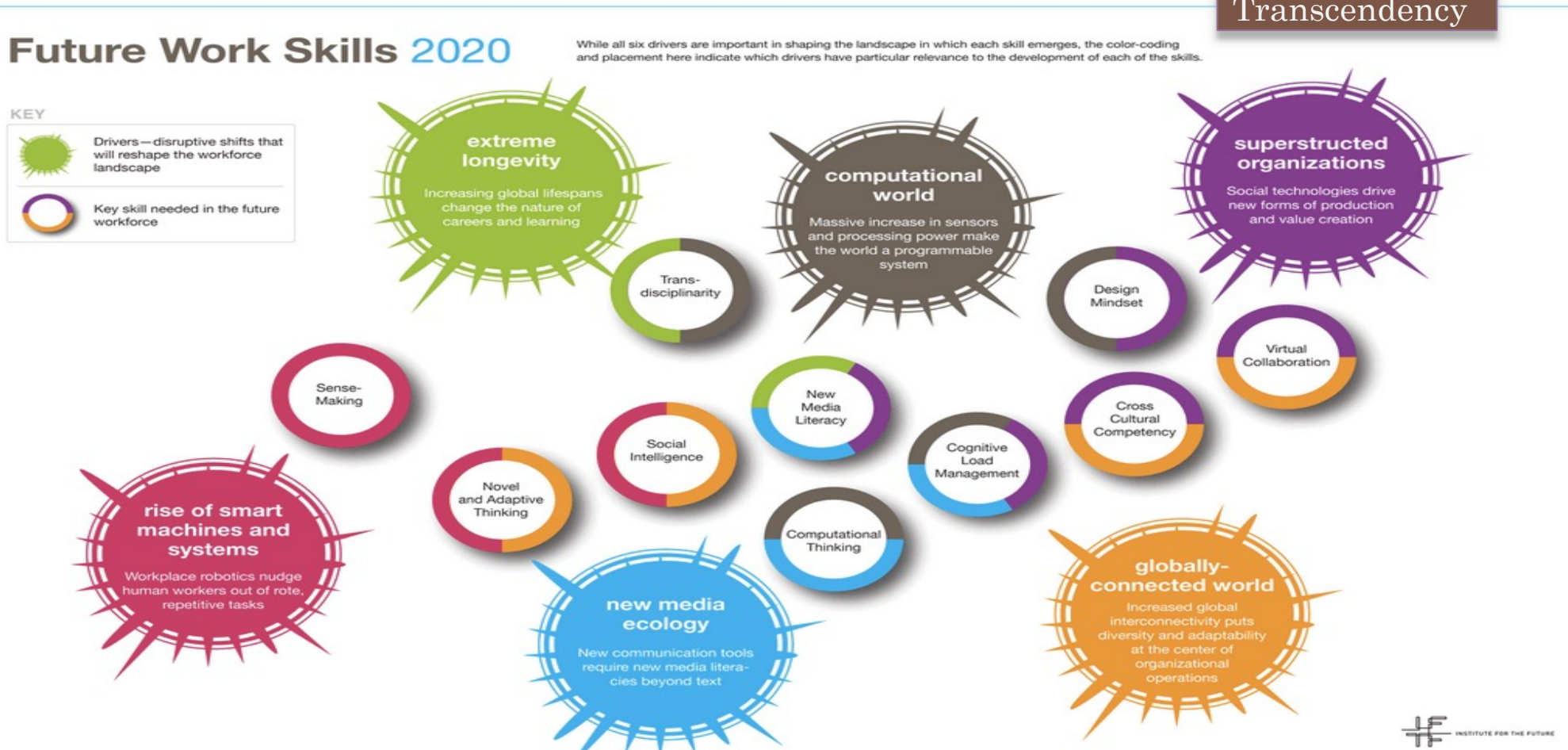
In order to work in a team . . .

- **Problem-Based Learning through Team-Based Learning**
- All members must be on the same page!
  - ICT enhanced Visual Organizers: SimpleMind®, Post-It Plus®
- Social Constructivism
- Consensus Building through Discussion/Communication
  - Using Cases: Authentic Situations that we may encounter in our daily life.

Sense Making:
ICT and Communication

- Communication Skills:
  Needs for communication with students from other cultures and values.
  - Long-Lasting Trust Building (Win-Win Negotiation Skills)
- Problem Solving Skills: Common issues in our society
- Project Management Skills:
  Working in Teams: International/Global Teams
- Consensus Building through TBL
- Go Global ! – Diversity, Cultural Differences, Inclusive Society

www.iftf.org/uploads/media/IFTF_FutureWorkSkillsSummary_01.gif

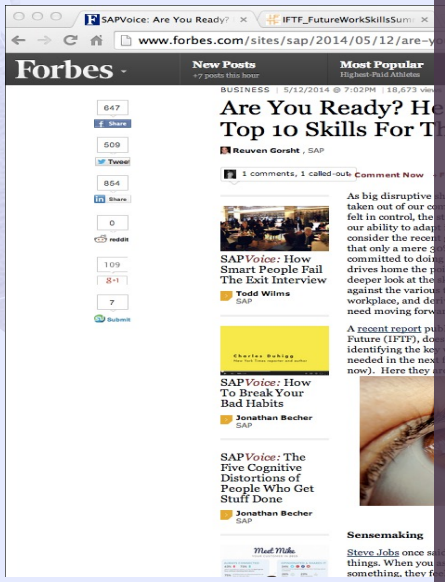


http://www.iftf.org/uploads/media/IFTF_FutureWorkSkillsSummary_01.gif

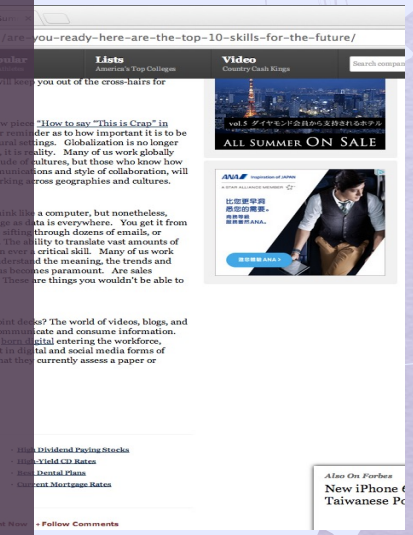
http://www.forbes.com/sites/sap/2014/05/12/are-you-ready-here-are-the-top-10-skills-for-the-future/2/

The Future, Better Life, Transcendency

10 Needs for Future Education



Sense Making
Social Intelligence
Novel & Adaptive Thinking
Cross-Cultural Competencies
Computational Thinking
New Media Literacy
Transdisciplinarity
Design Mindset
Cognitive Load Management
Virtual Collaboration



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CHARACTERISTICS OF 21ST CENTURY LEARNERS - *ACTIVE LEARNING FROM THE VIEWPOINT OF BLOOM'S TAXONOMY MATRIX*

For the sake of the discussion, it would be beneficial to talk about the characteristics of 21st Century Learners. Following Kharbach (2024),

1.Collaborative
The modern world is interconnected and cooperative, where collaborative skill is the key. The collaborative skill involves the ability to work in global teams, both in-person and virtually. Being deft in communication for empathy building to conduct projects to achieve team-defined goals. To guarantee the quality of globally collaborative teams, the members must be proficient in using online collaborative tools for communication and project management.

2.Creativity and Innovation
As Kettler et al. (2019) put it, creativity and innovation are essential learning skills in the 21st century, which will make learners think outside traditional frameworks and thus generate new ideas in terms of Problem-Based Learning. (henceforth, PBL)

3.Critical Thinkers
R. Sternberg (1985) views and defines critical thinking as "the mental processes, strategies, and representations people use to solve problems, make decisions, and learn new concepts" (cited in Shaw, 2014, p. 66). It follows that critical thinking is the basis for future learning skills to lead to problem-solving and authentic learning through recursive reflection.

4.Global Citizens
21st-century learners are aware of global issues in the realm of SDGs, cultural diversities, and perspectives. UNESCO emphasizes Global Citizenship Education (henceforth GCE) as an education that embodies a radical paradigm shift, focusing on developing learners' knowledge, skills, values, and attitudes essential for a world that is more just, peaceful, tolerant, inclusive, secure, and sustainable, referring to Maslow's Hierarchy of Needs.

5.Digitally Proficient
21st-century learners are digitally proficient or of high AI literacy, confident in identifying valid and reliable information in the digitally connected and archived internet world at large. They can make use of educational apps and software effectively and productively for authentic learning by interacting with global team members connected on the Internet. (For AI literacy, see below).

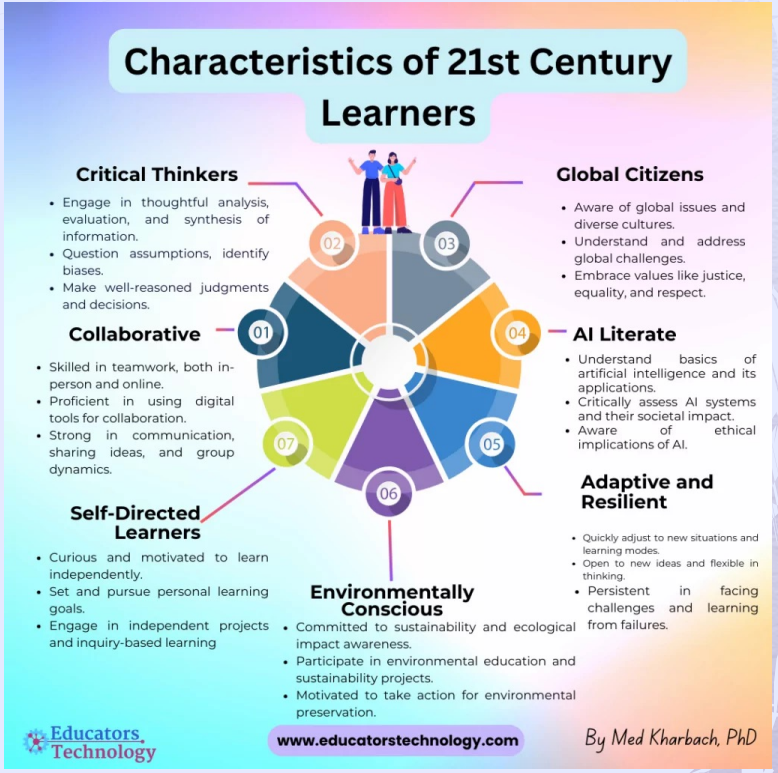


Figure 4. Characteristics of 21st Century Learners
From Kharbach (2024), 21st Century Education/ 10 Characteristics of 21st Century Learners

CHARACTERISTICS OF 21ST CENTURY LEARNERS - *ACTIVE LEARNING FROM THE VIEWPOINT OF BLOOM'S TAXONOMY MATRIX*

For the sake of the discussion, it would be beneficial to talk about the characteristics of 21st Century Learners. Following Kharbach (2024),

6.AI Literacy
Although Klein (2023) emphasizes understanding the basics of artificial intelligence and its applications in various fields, 21st-century learners here are capable of using AI as one of the thinking tools to conduct critical thinking in PBL.

7.Adaptive and Resilient
As symbolized by VUCA, adaptability and resilience are key traits for 21st-century learners. Ployhart and Bliese (2009) define that they include an individual's ability, skill, disposition, willingness, and motivation to change for the better or fit different tasks in social or environmental conditions at the global or gLocal levels.

8. Environmentally Conscious
As the concepts of SDGs prevail, 21st-century learners must be environmentally conscious and committed to sustainability and an understanding of ecological impact at the global level, demonstrating pro-environmental behaviors.

9. Self-Directed Learners
21st-century learners must take initiative in their own life-long learning mindset, arousing their own curiosity and motivation to continue learning by setting and pursuing their own goals. The ultimate goal of learning is to lead to innovative solutions for the benefit of the future society.

10. Ethically aware
Integrity in digital contexts is the most important trait for 21st-century learners. Taking ethical actions using digital tools and platforms is the key. In spite of the advancement of AI and IT technologies, it is humans to make fair decisions or set directions for the future.

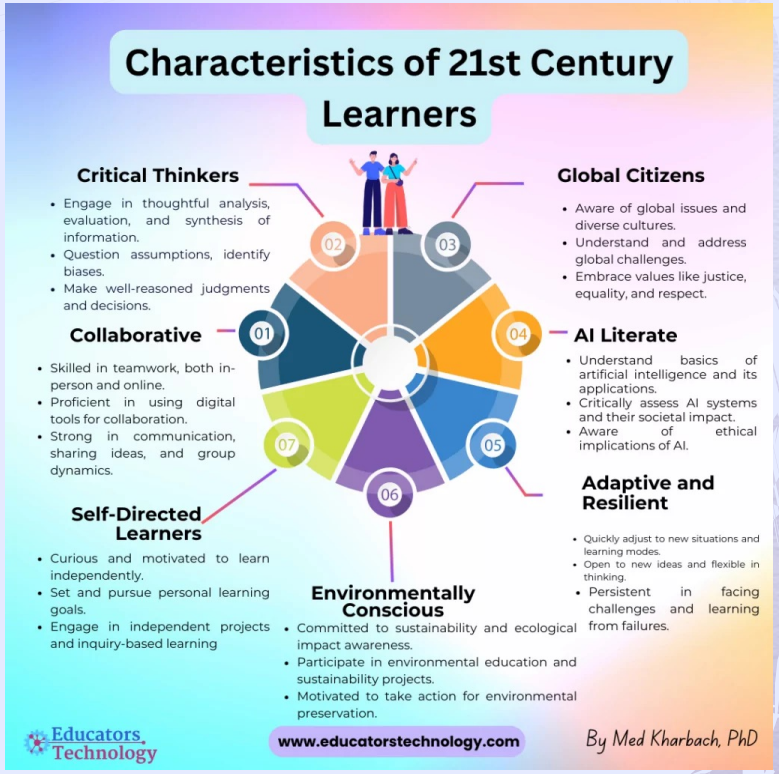
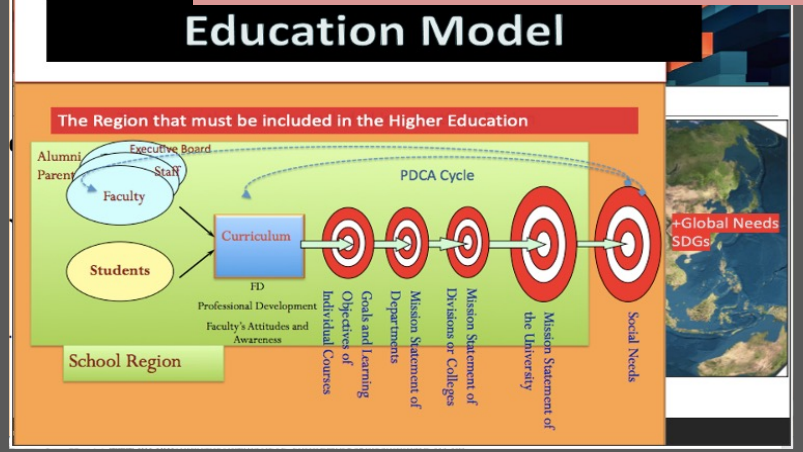
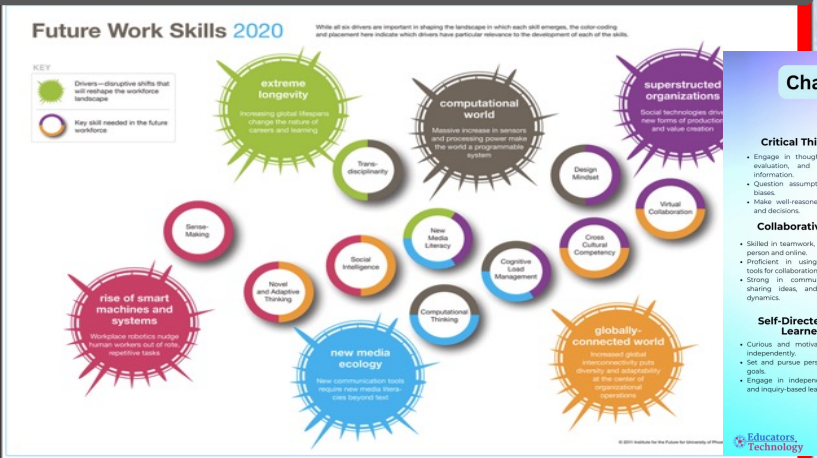


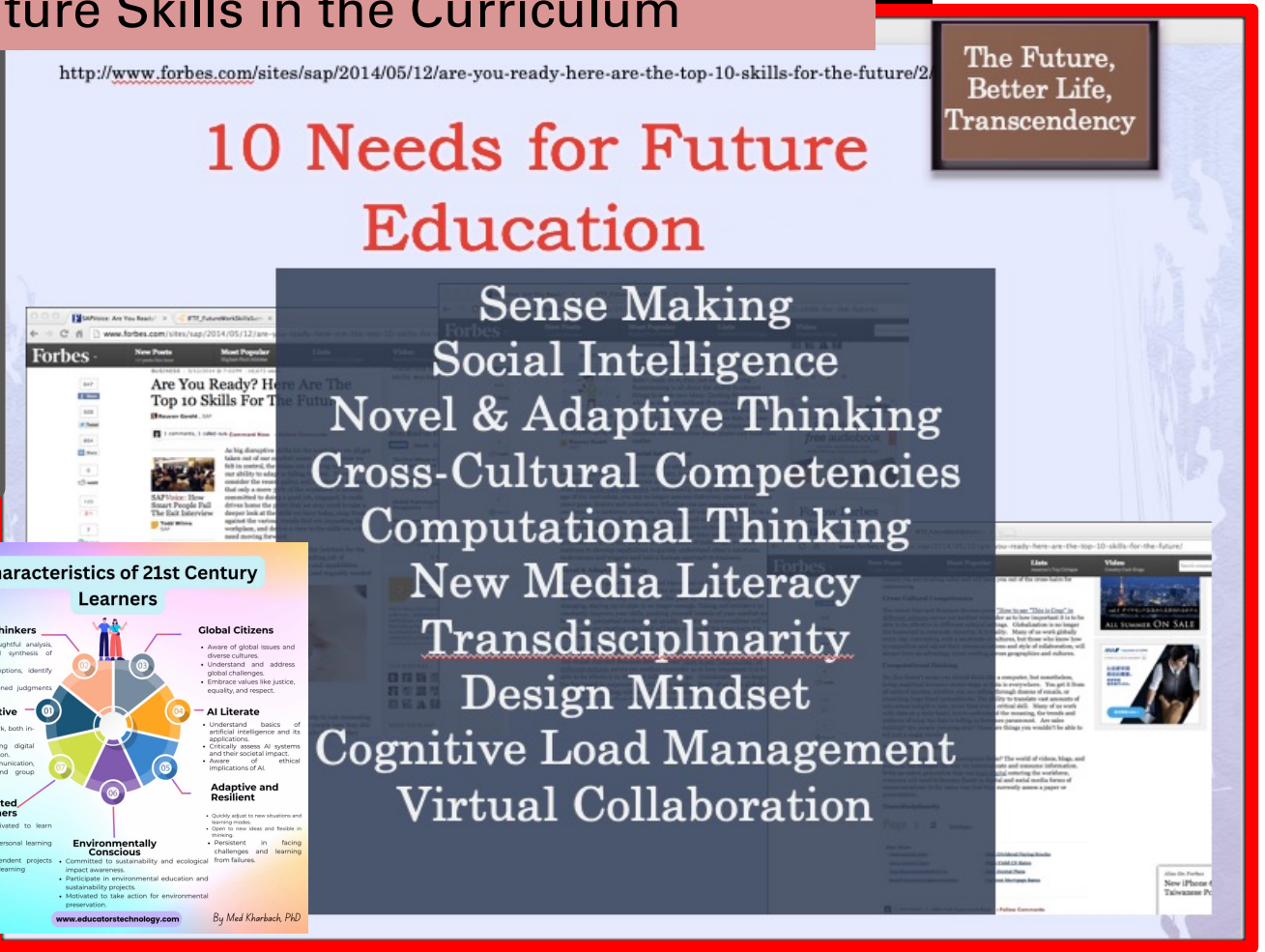
Figure 4. Characteristics of 21st Century Learners
From Kharbach (2024), 21st Century Education/ 10 Characteristics of 21st Century Learners

Education Model

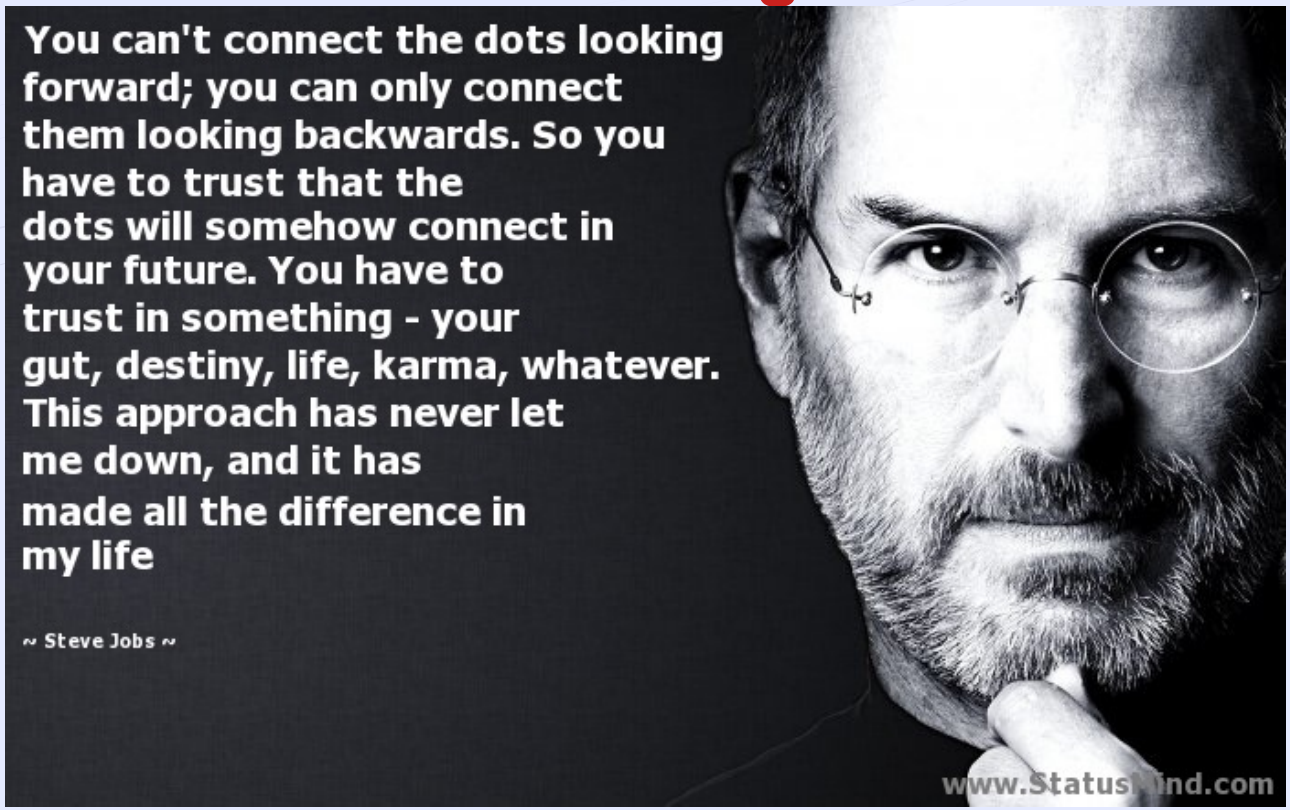
Incorporating Future Skills in the Curriculum



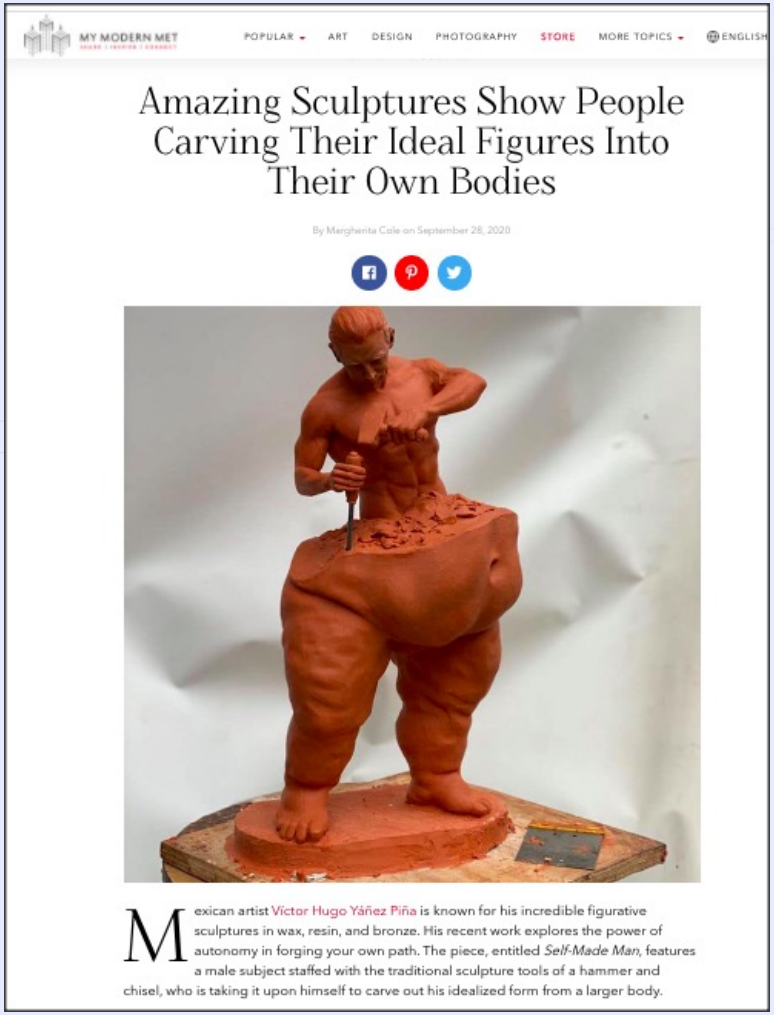




Innovation => Connecting the Dots in the Past



http://statusmind.com/life-quotes-844/



MY MODERN MET

POPULAR ART DESIGN PHOTOGRAPHY STORE MORE TOPICS ENGLISH

Amazing Sculptures Show People Carving Their Ideal Figures Into Their Own Bodies

By Margherita Cole on September 28, 2020

Mexican artist Víctor Hugo Yáñez Piña is known for his incredible figurative sculptures in wax, resin, and bronze. His recent work explores the power of autonomy in forging your own path. The piece, entitled *Self-Made Man*, features a male subject staffed with the traditional sculpture tools of a hammer and chisel, who is taking it upon himself to carve out his idealized form from a larger body.

We can only cause innovations from what we already have!

https://mymodernmet.com/victor-hugo-yanez-pina-sculptures/?fbclid=IwAR0W6UzIiKtNm05esgysXm7J9Shpq3goJiZtUZDTTNb_mkGhYIF_W58jZpA

http://coil.suny.edu/homeA

Image source: www.uvic.ca/hsd/nursing/assets/images/photos/international/globe.jpg

Learning Environment

Learning Opportunities

Global Learning

COIL (Collaboration Online International Learning)

COIL is a method which two classes (or more) from different universities (and possibly from different countries) can work on a same project together, or simply create an opportunity to have intercultural/international communication with the ICT enhanced tools. Various tools available in Web 2.0 era are used in order to enable this kind of connection among them. Kansai University is interested in formally adopting this kind of activities as institutionally encouraged / promoted endeavor as a part of globalization/internationalization act for us. KU is going to have its 130th anniversary year very soon (2017), and it wants to include the development of Kansai COIL platform with overseas network by then.

COIL has begun in SUNY, USA. More information can be found in their homepage, and some relevant parts are cut

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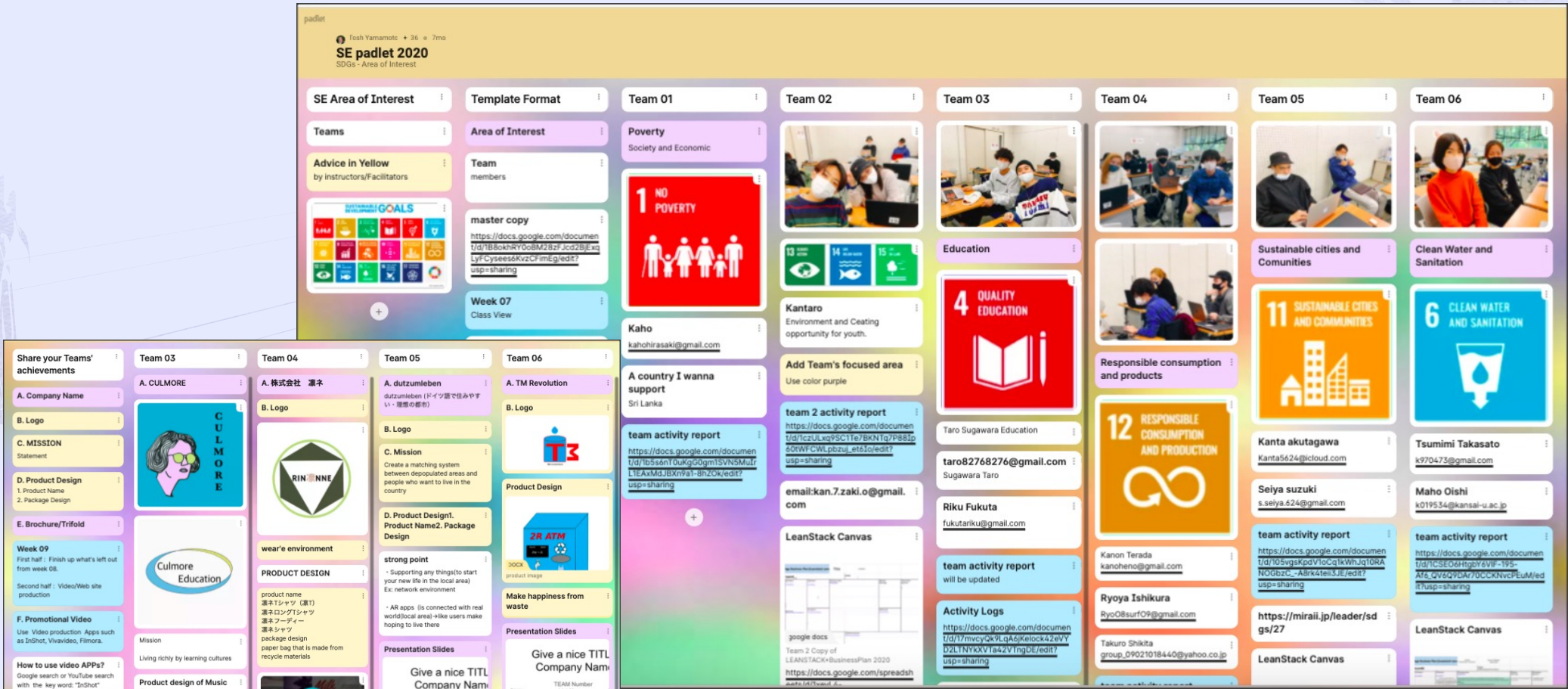
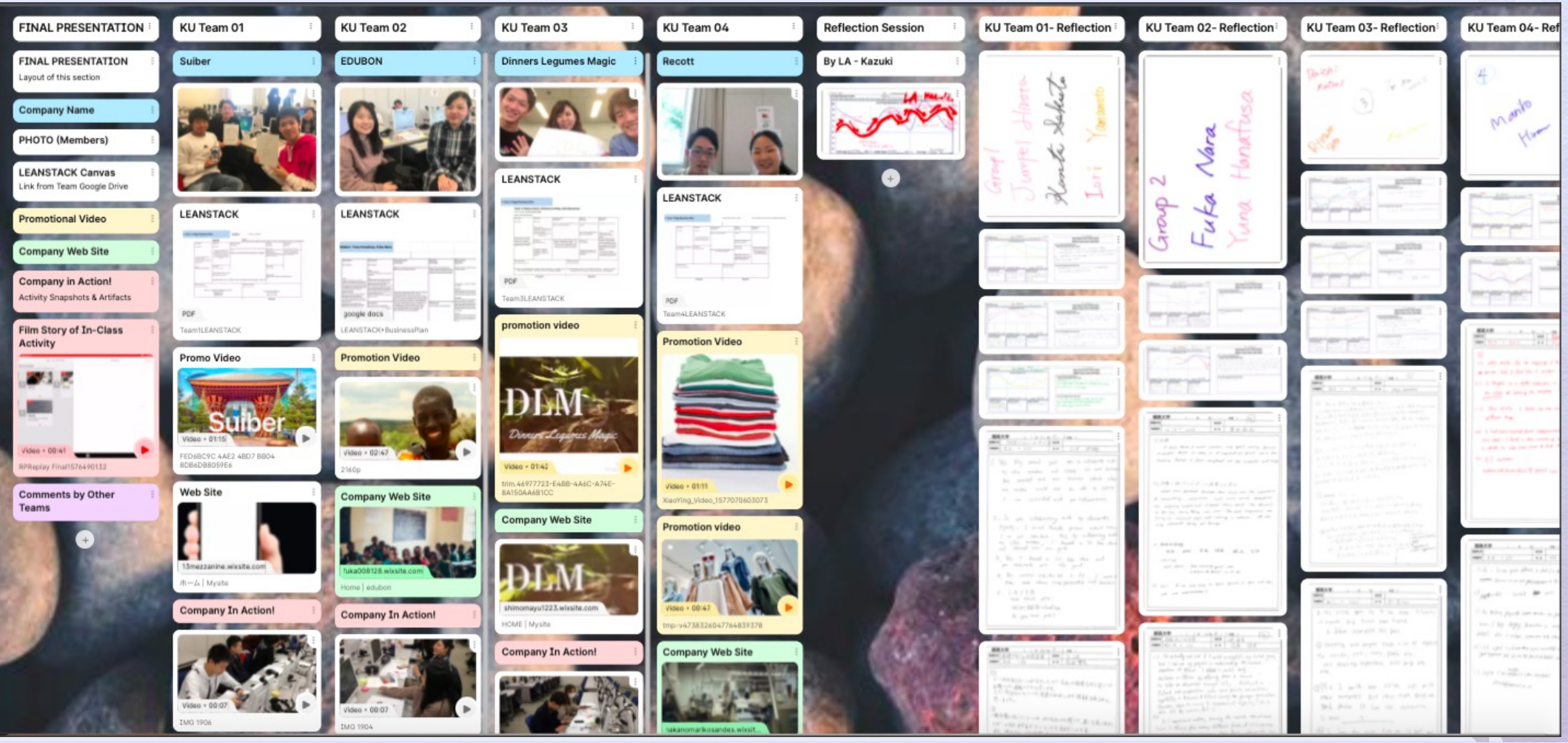


SDGs as the realm of global learning

Padlet opens up many possibilities for COIL-based Learning with Meta-Cognitive Reflection!



2020 and beyond … NYP Course Contents

Active Learning – PBL (Global Learning)

Showcase::Realm of Learning:: SDGs

Image source: http://3.bp.blogspot.com/-u8-XC12wqNA/Um_dD9XzE-I/AAAAAAAAAm4/fPBDXl5Omfc/s1600/148109611.jpg

Learning Opportunities

Industrial/Business Coalition/Partnership

Design your Ideas! In the fall semester, a total of 67 students and learning assistants (LA) will participate in business design and industrial design as a part of the class ”Design Ideas!", run by Professor Toshiyuki Yamamoto, Division of Promotion of Educational Development.

This program aims at fostering communication skills in teams to come up with innovative products, which can be marketable as the Kansai University brand. Based on the

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Collaborative Online International Learning

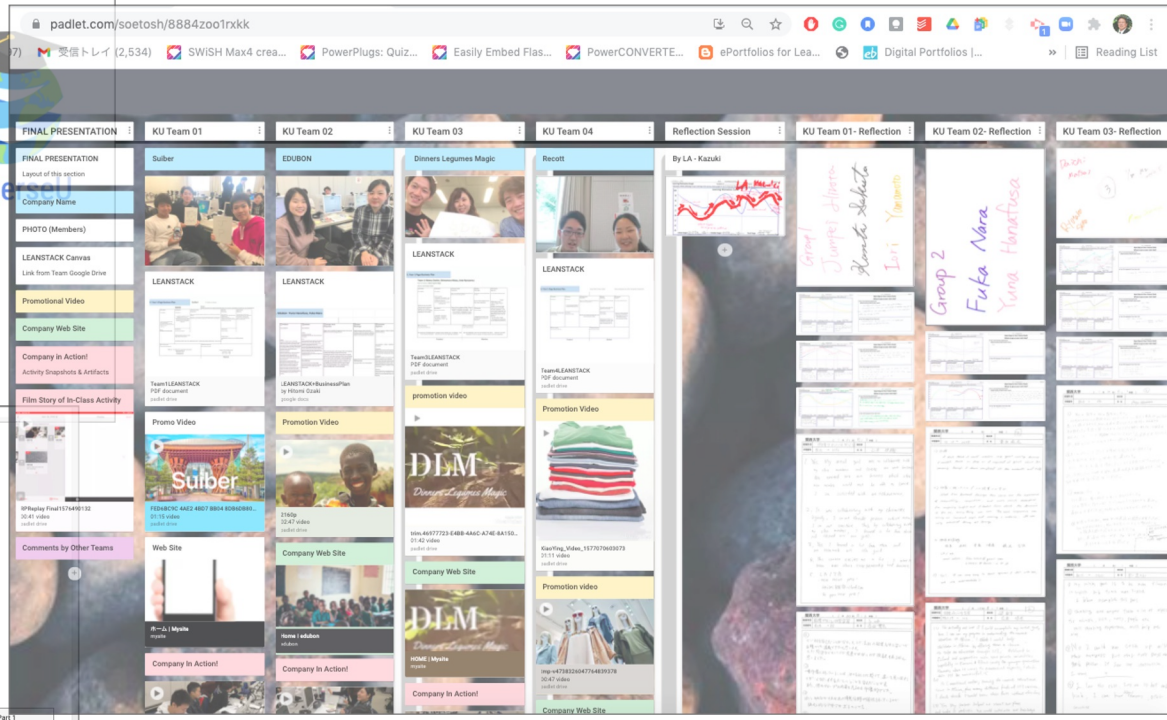
Social Entrepreneurship

Kansai U – NYP, Singapore - Texas A & M

ImmerseU

Connecting the world. Brought to you by IIGE & Class2Class.

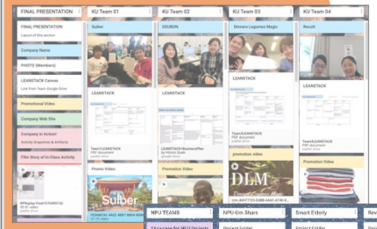
CLASS 2 CLASS

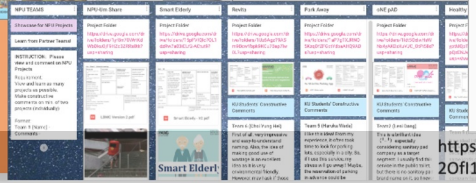


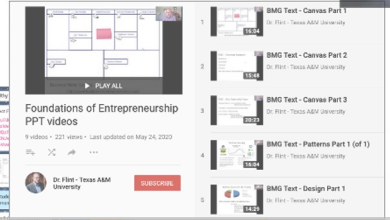
- Social Entrepreneurship

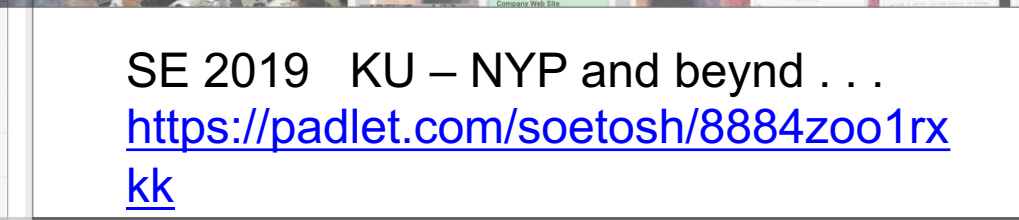
  KU – Singapore NYP – USA Texas A & M
- Period: June – Sept
  - Texas A&M Summer Term 6 Teams (End of May ～)
  - Nangyang Polytech(NYP) 20 Teams (April 20th ～)
  - Kansai University 1~2 Teams (April 20th ～)
- Students: =>Study Abroad

Course Contents









https://www.youtube.com/playlist?list=PLD3_vtr_3D52l2Ofl1_CKOtkKlrfxbBa9

SE 2019 KU – NYP and beynd . . .

https://padlet.com/soetosh/8884zoo1rxkk

Collaborative Online International Learning

ImmerseU

Social Entrepreneurship

Kansai U – NYP, Singapore - Texas A & M

ImmerseU

Connecting the world. Brought to you by IIGE & Class2Class.

INSTITUTE FOR INNOVATIVE GLOBAL EDUCATION
KANSAI UNIVERSITY | OSAKA, JAPAN

CLASS 2 CLASS

Course Contents

- Social Entrepreneurship

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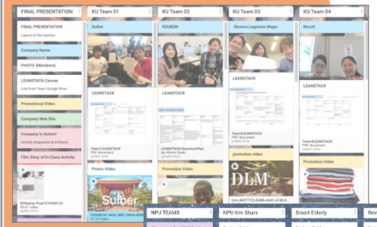

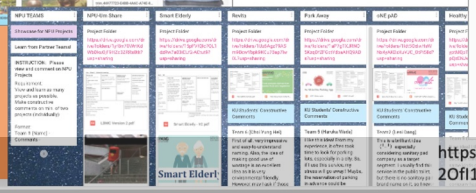

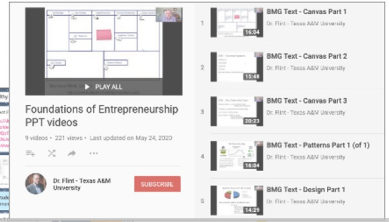

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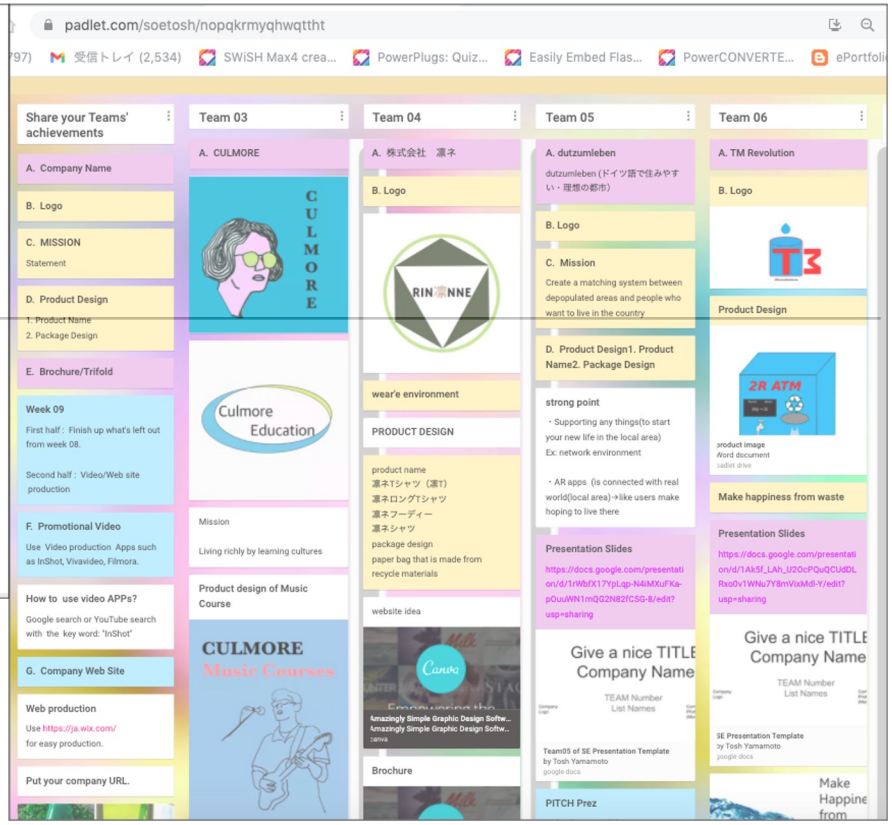

SE 2020 and beyond… KU – NYP
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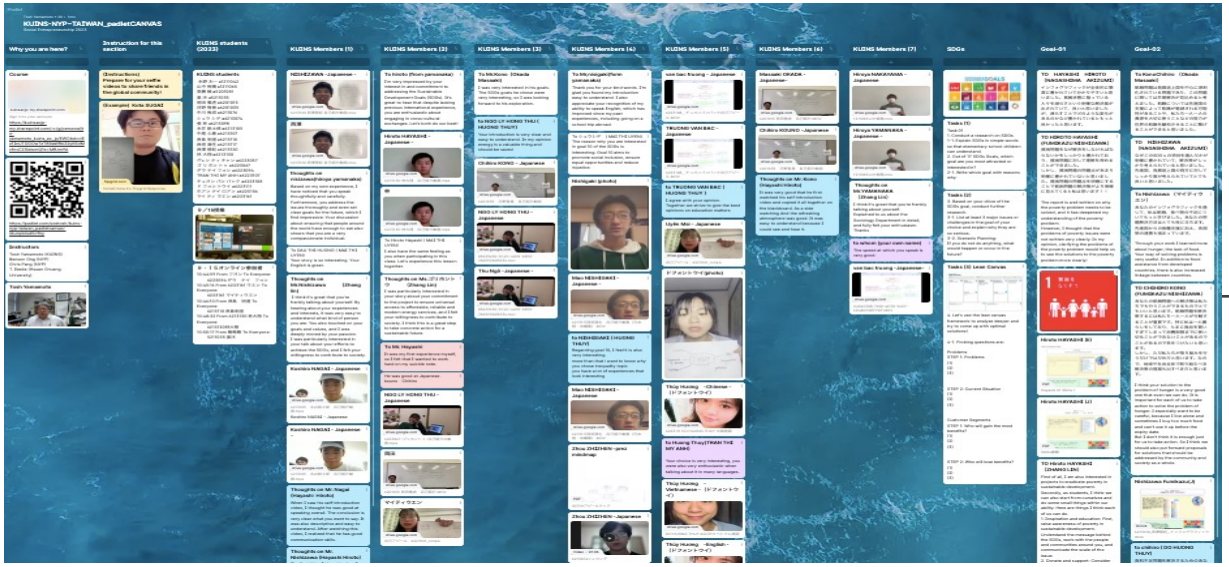

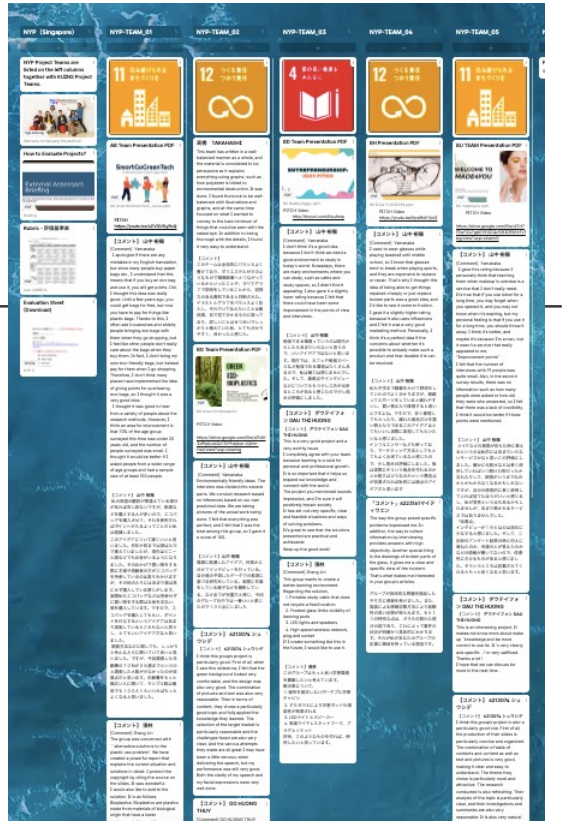

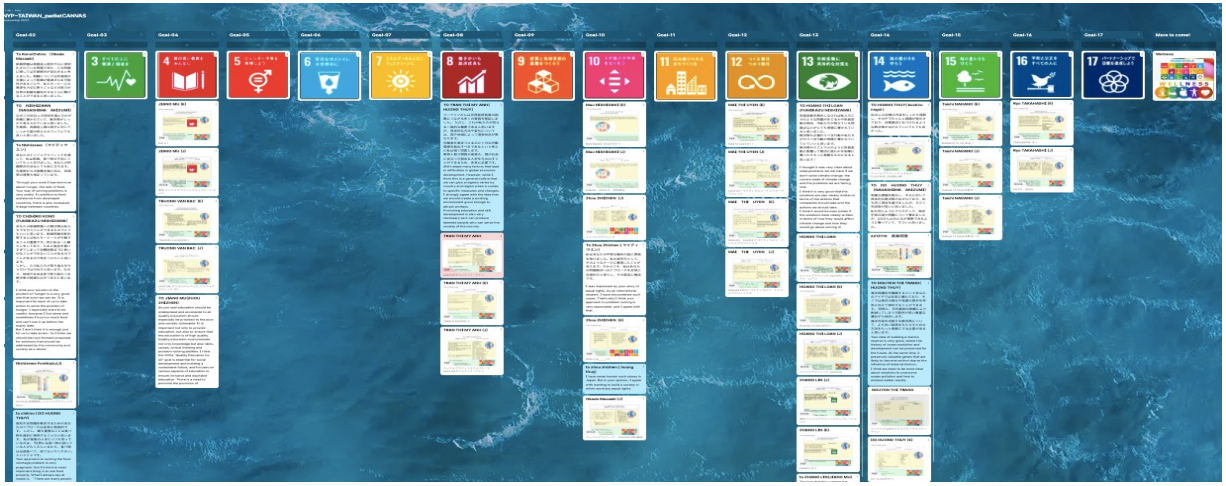

SE KUIS-NYP-Taiwan and beyond…
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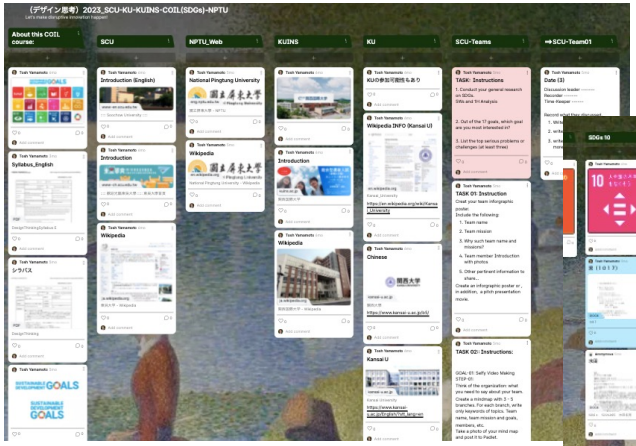
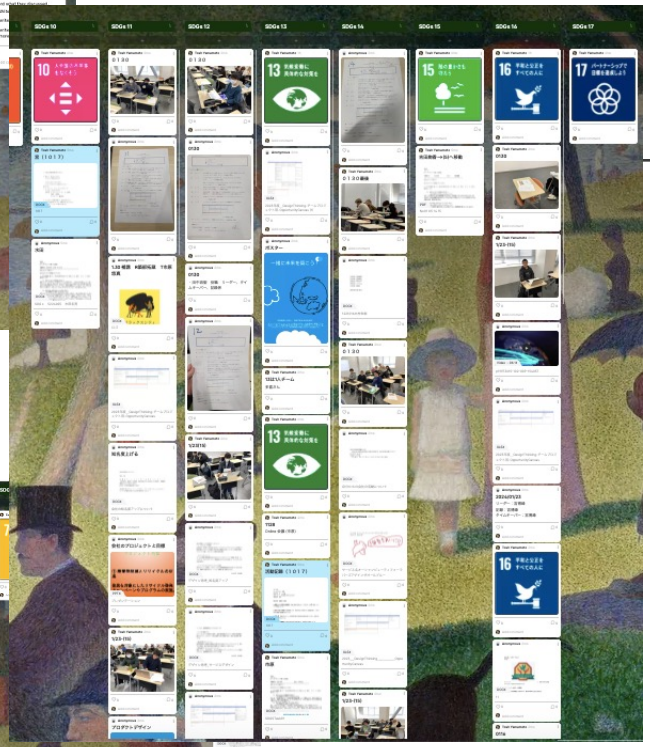
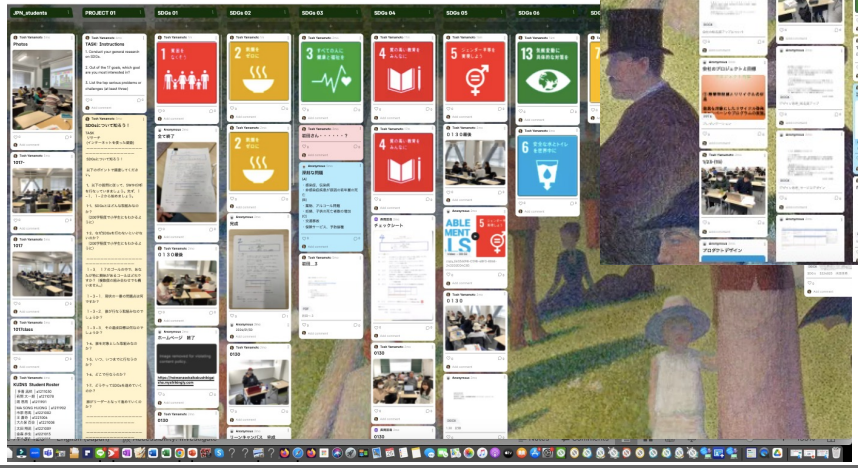
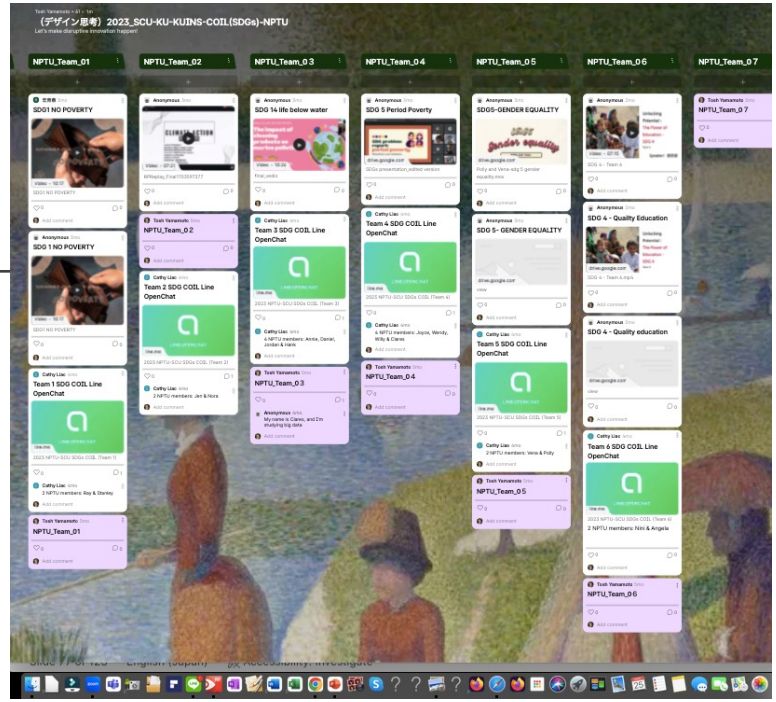


SCU　東呉大學







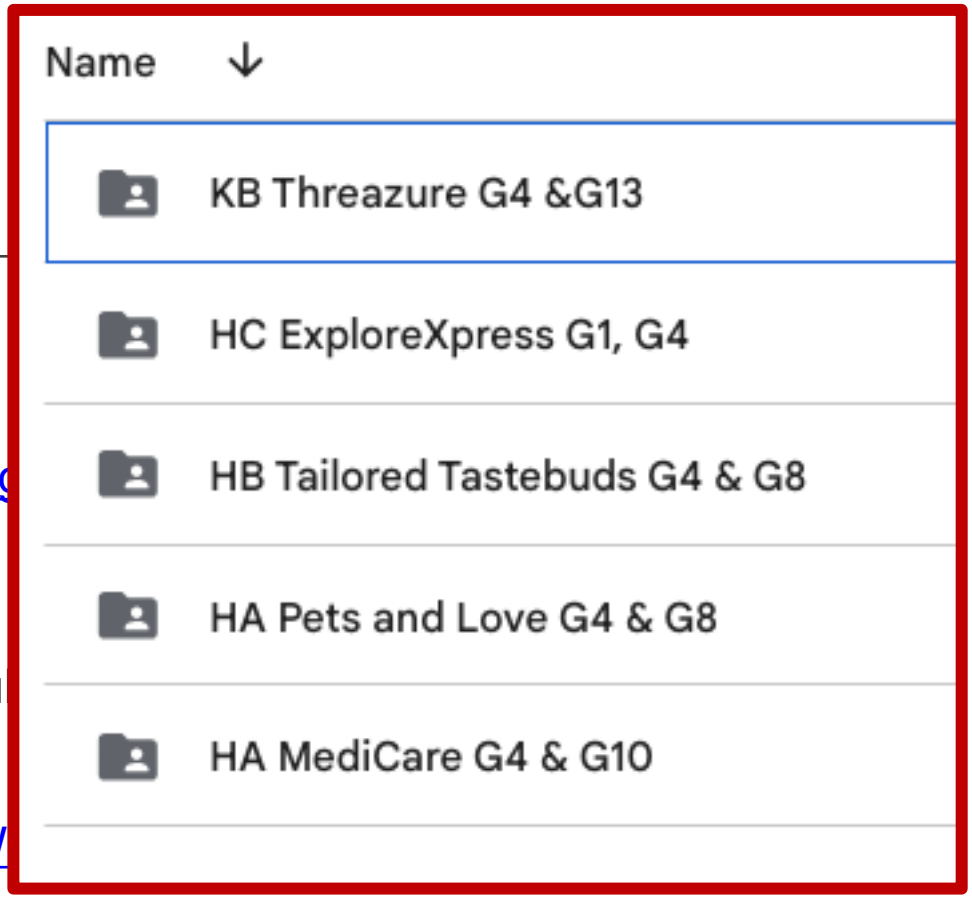
National Pintung University

SE KUIS-NYP-Taiwan and beyond…

https://padlet.com/soetosh/2023_scu-ku-kuins-coil-sdgs-nptu-pd34xtq33ae07q0g

Pitches

- access to five videos via this link: https://drive.g
  bv7SFOoYHPgMstYa0gnmbhLx0gqCRc
-
- You will be assessing 5 pitches assessment ru
-
- Assessment link: https://forms.office.com/r/SW



Learning Opportunities

Authentic Learning

Global Learning

Regional Coalition/Partnership

Industrial/Business Coalition/Partnership

Social Entrepreneurship

KUISs

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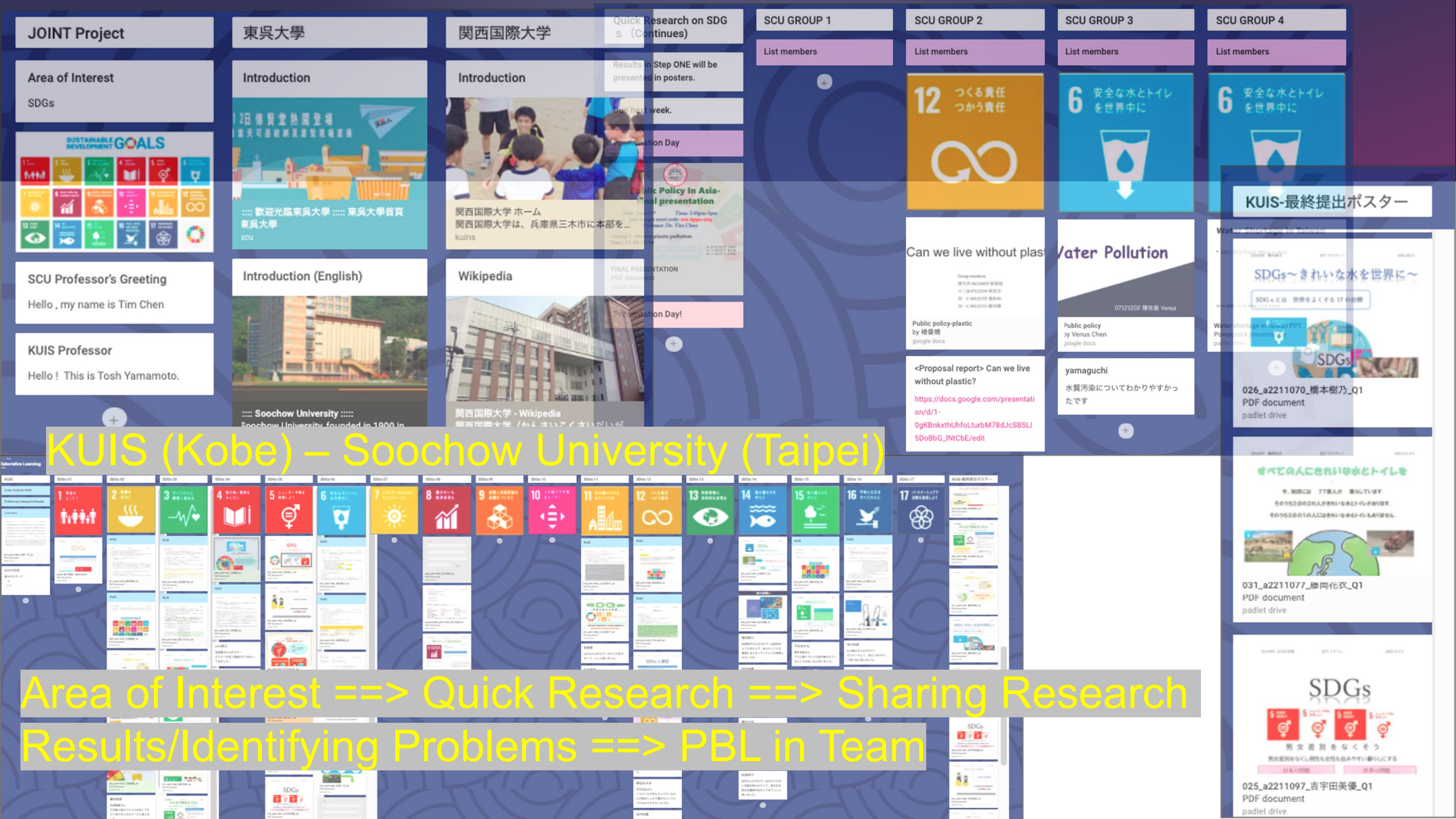
COIL → Collaborative Online Global & Tesseractive© Learning

Image of Learning compared to bridge building in Rome.
Snapshots for the learning process as well as the development flow of the learning set by the learner.

PBL → Social Entrepreneurship

シューシュタルの遺跡より

From Google



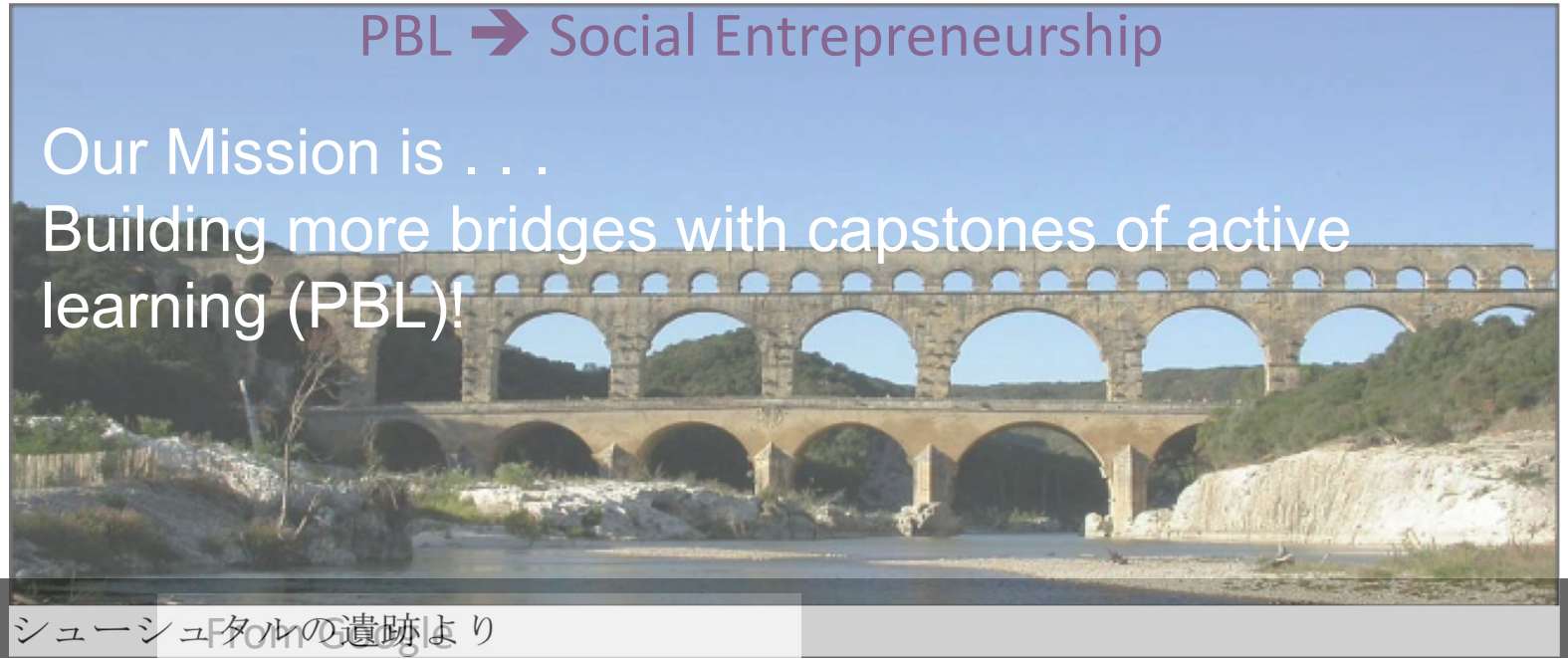
KUIS (Kobe) – Soochow University (Taipei)

Area of Interest ==> Quick Research ==> Sharing Research Results/Identifying Problems ==> PBL in Team

Regional Development (PBL) Involving High School Students

COIL → Collaborative Online Global & PBL Learning

Image of Learning compared to bridge building in Rome.
Snapshots for the learning process as well as the development flow of the learning set by the learner.



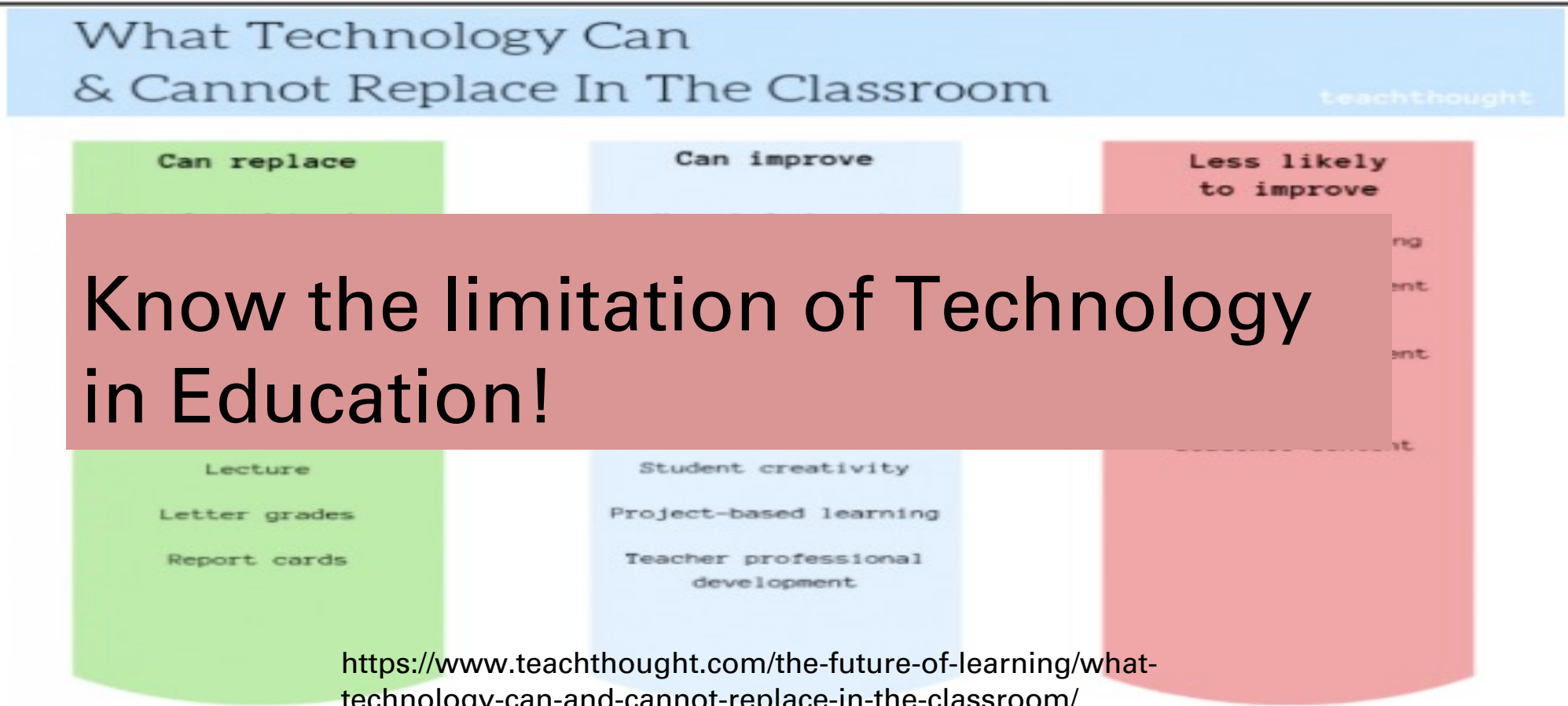
シューシュタルの遺跡より

What are the main challenges to designing authentic assessments?

- Professional Development
  - From Full-time researchers to Future Education Designer
  - Teaching ➔ Learning : Pedagogy to Andragogy
  - Passive Learning to Active Learning (AGILE Learning)
- Instructor Mindset
  - Future Design in Education
  - Be responsible for raising future generations with Future Skills
  - Future generation must face Singularity (2045): Freshmen today will be almost 50 years old!

What Technology Can & Cannot Replace In The Classroom

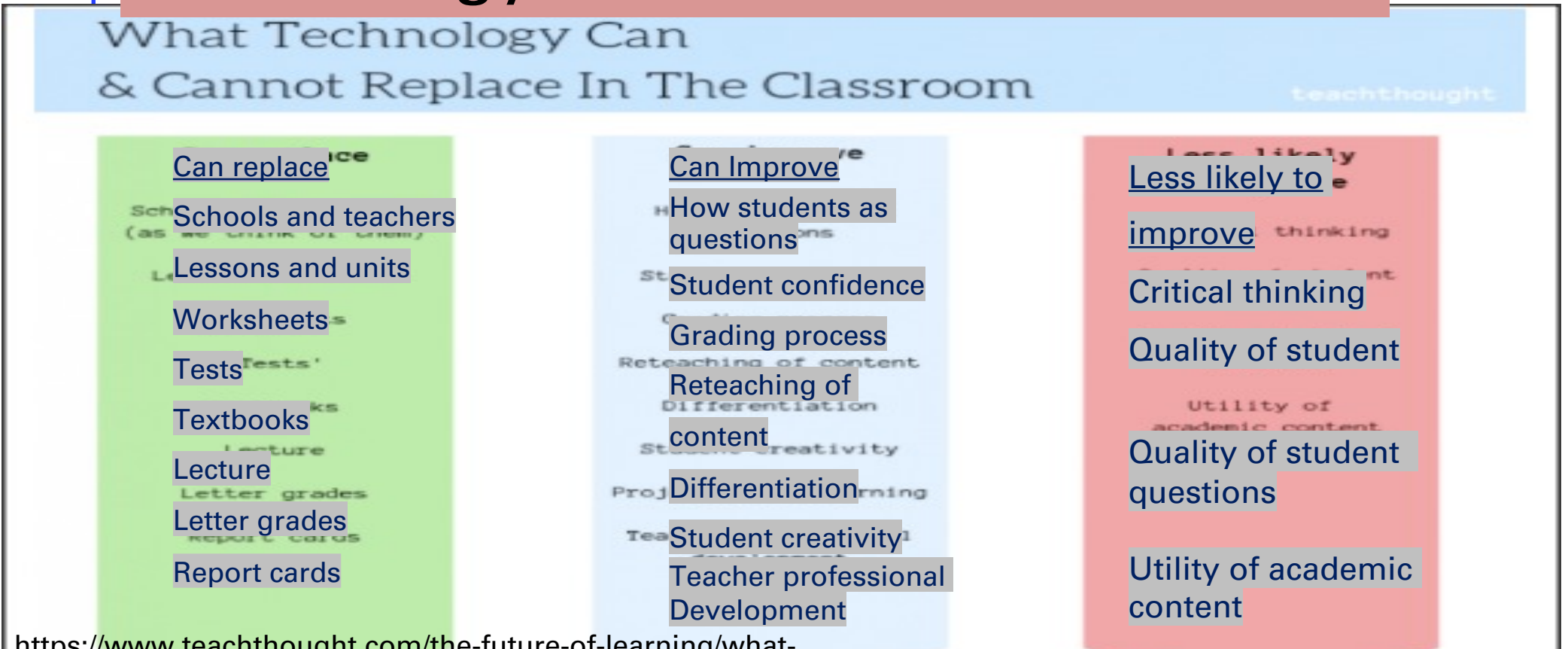
by Terry Heick — October 16, 2019 in The Future Of Learning 12 min read



Know the limitation of Technology in Education!

https://www.teachthought.com/the-future-of-learning/what-technology-can-and-cannot-replace-in-the-classroom/

Learning the limitation of Technology in Education



https://www.teachthought.com/the-future-of-learning/what-

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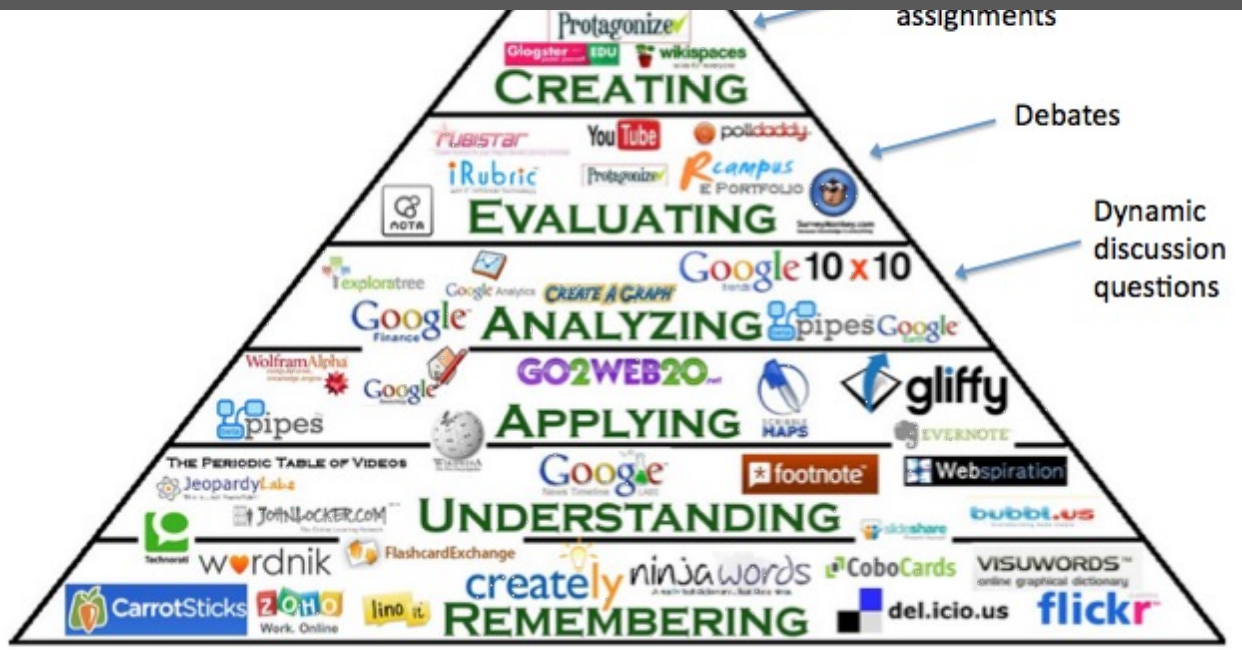
The Future, Better Life, Transcendency

http://catlintucker.com/wp-content/uploads/2012/04/Blooms-with-

Bloom's taxonomy: Learner's Activities



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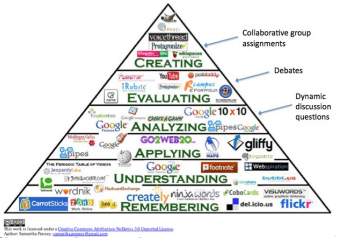
Author: Samantha Penney, samantha.penney@gmail.com



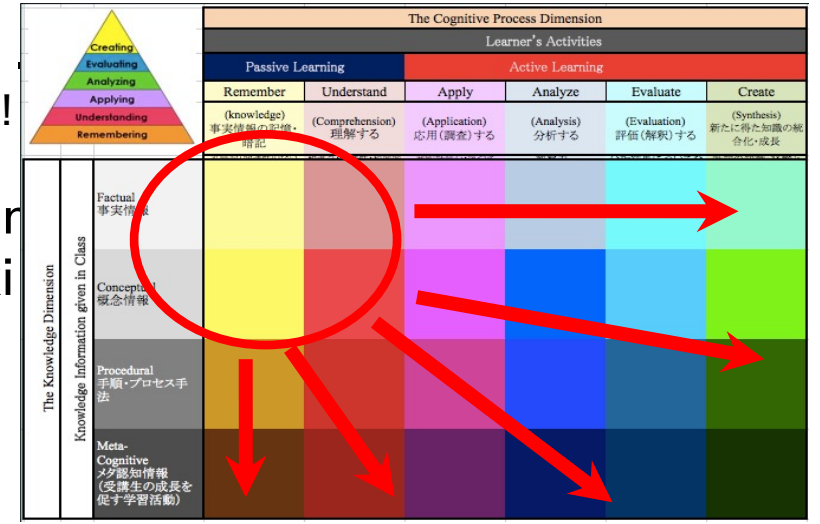
			The Cognitive Process Dimension					
			Learner's Activities					
			Passive Learning		Active Learning			
			Remember	Understand	Apply	Analyze	Evaluate	Create
			(knowledge) 事実情報の記憶・暗記	(Comprehension) 理解する	(Application) 応用(調査)する	(Analysis) 分析する	(Evaluation) 評価(解釈)する	(Synthesis) 新たに得た知識の統合化・成長
The Knowledge Dimension	Knowledge Information given in Class	Factual 事実情報						
		Conceptual 概念情報						
		Procedural 手順・プロセス手法						
		Meta-Cognitive メタ認知情報 (受講生の成長を促す学習活動)						

How can educators measure the success of assessment design and what role if any does student feedback play in this process?

- Authentic Assessment in the traditional education paradaigm ➔will lead nowhere!

New Education Normal choreographed around ICT is a must!

- Need for Innovative Future Educator
  - Bloom's taxonomy Matrix and beyond . . .
    - From the top left corner to the entire matrix!
  - In order to set the realm of authentic learning & associated learning assessmer
    Learning Tools to enhance the Future Ski (e.g. Critical Thinking) must be applied in AGILE Learning!



We have viewed:

Outline

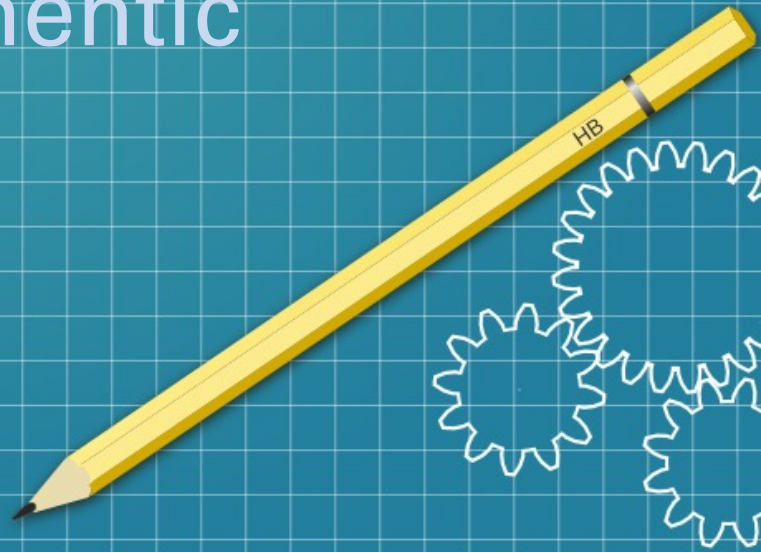
Education Informatics
in the New Normal

- (i) Be Authentic! - Facts around Education
- (ii) Journey to Authentic Education
- (iii) Future Skills
- (iv) Authentic Learning (Showcases)

Focus Today

We will focus on the Innovative and Authentic Learning

to-yamamoto@kuins.ac.jp
soetosh@gmail.com



MIRROR

Active Learner

Visualization of Learning Mind

Assumption:
The MIRROR of the Learning Mind ➔ The Learner's Writing about Learning in Process (Goal Setting, Learning Anxiety, Reflectionon, etc.)

DATA SCIENCE APPROACH

Image rource https://www.searchenginejournal.com/data-science-seo/339277/#close

https://www.searchenginejournal.com/data-science-seo/339277/#close

Thank you very much!

End of Tosh & Dr. Hayashi' Presentation

Join US!
Our Team Solicits Global COIL Team Members!

to-yamamoto@kuins.ac.jp
soetosh@gmail.com

Outline : Schedule (14:00 – 17:30)

[14:00 – 15:30] - FOCUS: K-12 STEAM

(1) the general overview of the education paradigm presented by Tosh and Dr. Hayashi

(2) Innovative approach of K-12 STEAM cases by Juling'Shih's graduate student, Jenny Tsai, and possibly Cathy (National Pingtung University).

If time allows, we will move forward and get into (3) the turf of EMI and writing enhanced with AI by Prof. RuShan Chen and Prof. Peggy Tsai.

COFFEE BREAK (the poster area)

[16:00 – 17:30]] - FOCUS: K-12 STEAM and beyond & Higher Education

For the second half, the workshop focuses on:

(3) EMI and AI enhanced global collaboration.

Prof. RuShan Chen and Prof. Peggy Tsai are the expertise in this area. EMI and AI enhanced learning will be presented here. Peggy's presentation on AI-enhanced learning and RuShan's COIL-based EMI writing courses are elaborated. Also, on-going projects like ours will be given here.

Prof. Chris Pang may share his view on educational use of AI in the future of education.

(4) Also, on-going projects like ours will be given here. COIL-based entrepreneurship in the realm of SDGs. If Benson is available, he shares his experience in COIL-based Social Entrepreneurship with Kansai University and KUIS.

(5) Dr. Hayashi will present our recent development from the light of Data Science and the cyber physical learning environment for authentic learning.

And at the end, we will have an open discussion at the end to wrap up.

Go to (2) Jenny Tsai Presentation

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Go to (5) Ysasuhiro Hayashi Presentation