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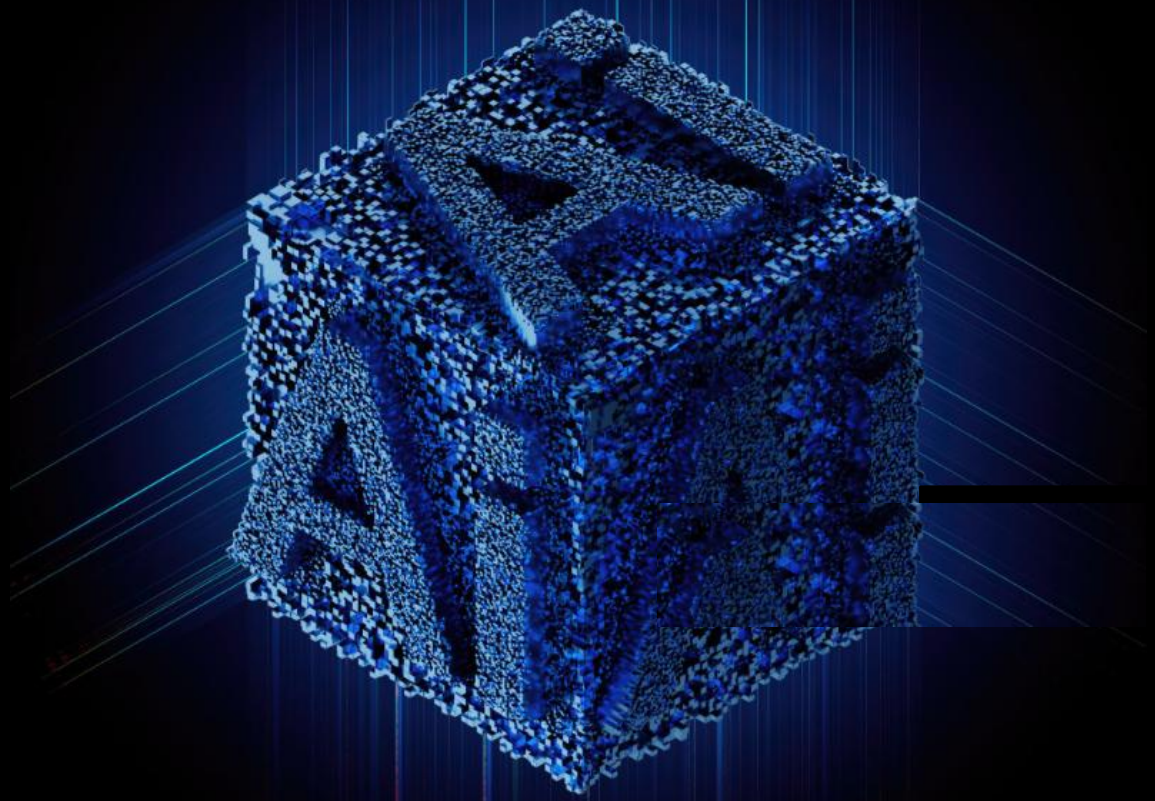
TaLiC Teaching and Learning Innovation Centre

Aligning AI Literacy with Industry: A Multidisciplinary Approach to Future Readiness



HKU-ECNU Joint Workshop 2023

Prof. Cecilia K Y Chan
Director Teaching and Learning Innovation Centre (TALIC)
The University of Hong Kong
31 October 2023

Mentimeter

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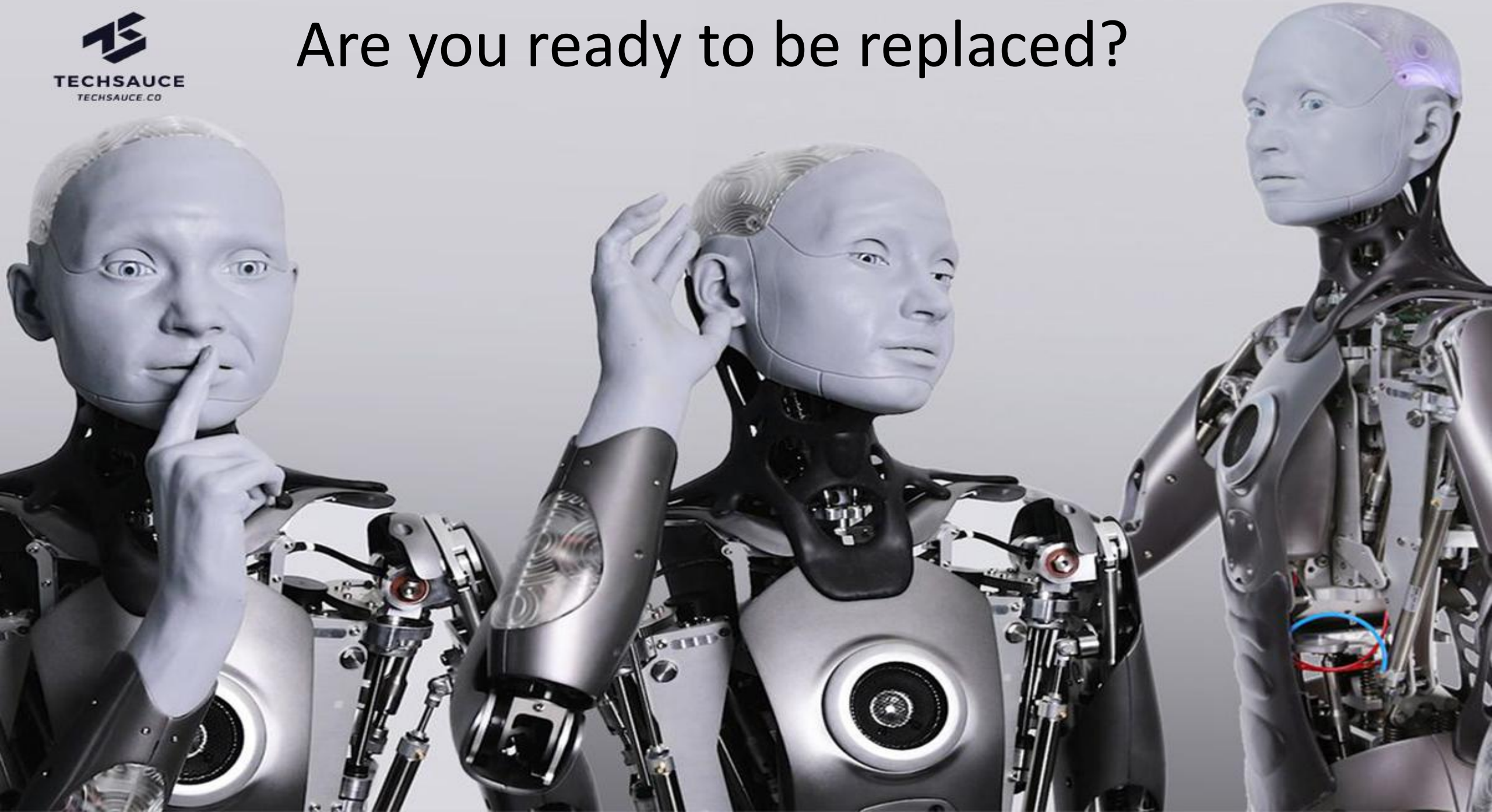
Are you Future Ready?

Are you ready for more unexpected events?

TECHSAUCE
TECHSAUCE.CO

Are you ready to be replaced?



Are you ready to accept new ideas in the new world?

MONEYWATCH ›

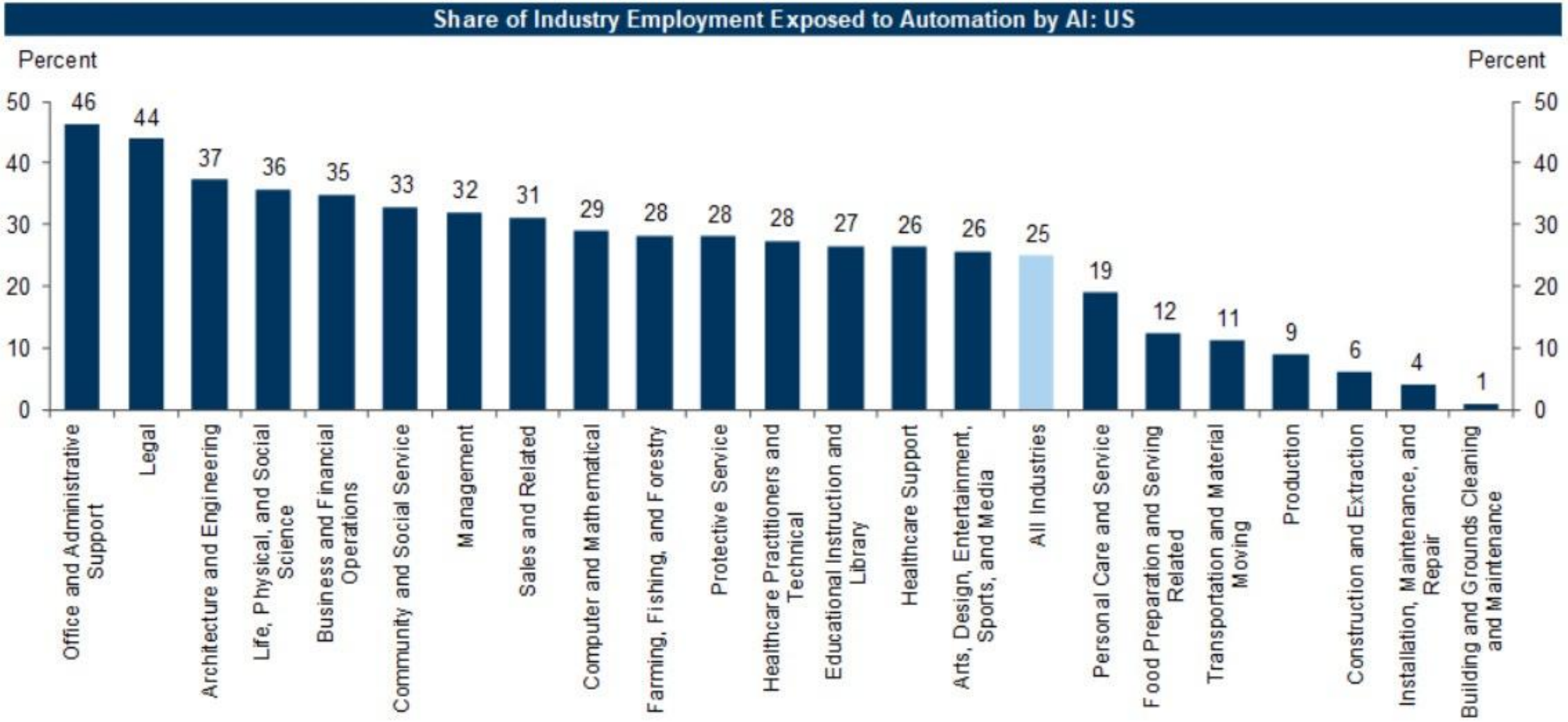
AI ChatGPT is helping CEOs think. Will it also take your job?

MONEY WATCH

BY MEGAN CERULLO

JANUARY 24, 2023 / 5:00 AM / MONEYWATCH

Exhibit 5: One-Fourth of Current Work Tasks Could Be Automated by AI in the US and Europe

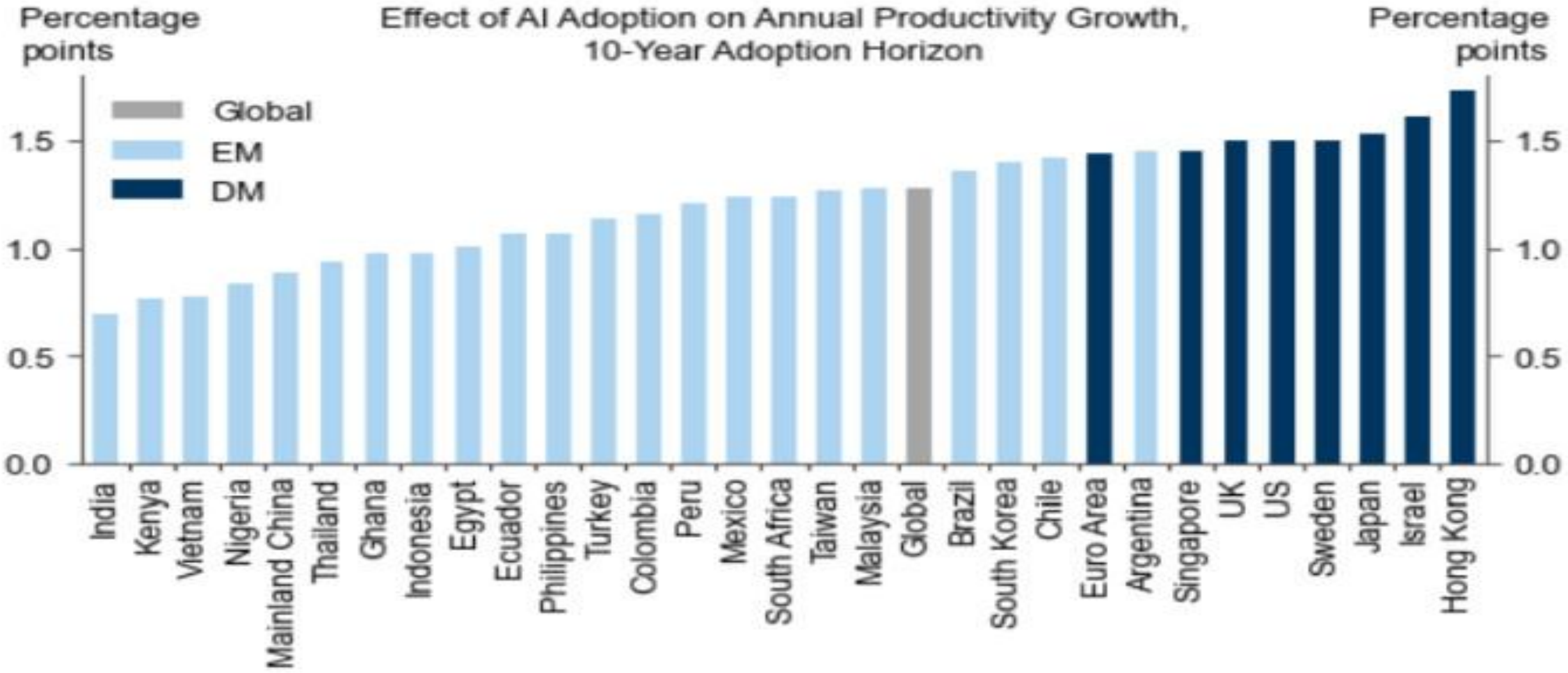


Source: Goldman Sachs Global Investment Research

March 27, 2023

https://www.ft.com/content/50b15701-855a-4788-9a4b-5a0a9ee10561

Exhibit 14: Productivity Growth Boosts Could Be Sizable in Other Countries As Well; We Estimate Widespread AI Adoption Could Boost Global Annual Productivity Growth by 1.4pp Over a 10-Year Period



Source: Goldman Sachs Global Investment Research

March 27, 2023

https://www.ft.com/content/50b15701-855a-4788-9a4b-5a0a9ee10561

What can we do to ensure our students are future ready?

Engineering & Education

- Machine Vision/DSP
- Machine Learning
- Assessment
- 21st Century Skills (Holistic Competencies/Future Readiness Skills)

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AI is here to stay
Is it
A Game Changer?
Or
A Pandora Box?

Well, that kind of depends on our move as human and also our move as educators

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What is AI Literacy?

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So who coined AI literacy?

The exact origin of the term “AI literacy” is unclear.

Authors	Year	Method Used	Level	AI Literacy Studies - Description
Kandlhofer et al.	2016	AI education framework	Kindergarten to University	Proposed an AI education framework targeting various educational levels; emphasis on defining key AI literacy topics with a step-by-step educational approach.
Long and Magerko	2020	Interdisciplinary exploratory review of literature	-	Defined AI literacy and developed a conceptual framework focusing on guidelines for AI literacy development.
Ng et al.	2021	Exploratory review	-	Proposed a multi-dimensional framework for AI literacy focusing on four key aspects, knowing and understanding AI, applying AI, evaluating and creating with AI, and addressing AI ethics and mapped onto Bloom's Taxonomy.
Kong and Zhang	2021	Conceptual framework	Citizens in the digital age	Proposed a three-dimensional framework for AI literacy structured around cognitive, affective, and sociocultural dimensions.
Liu and Xie	2021	Impact study	University students (China)	Presented a framework focusing on three core aspects of AI literacy: Digital Literacy, Computational Thinking, and Programming Ability.
Karaca et al.	2021	Psychometric tool development	Medical Education and Data Science	Introduced the concept of "AI readiness" and developed a psychometric tool to measure medical students' perceived readiness for AI.
Laupichler et al.	2022	Scoping literature review	Higher and Adult Education	Explored AI literacy constructs in higher and adult education, focusing on its definitions, evolution, and practical applications.
Markauskaite et al.	2022	Polylogue discussion	-	Proposed the concept of "AI capabilities," emphasizing a holistic approach that integrates cognitive, humanistic, and social perspectives.
Cetindamar et al.	2022	Scoping review	Organisational and Digital Workplaces	Defined AI literacy in the context of workplaces, detailing four core capabilities: technology-related, work-related, human-machine-related, and learning-related.
Kong et al.	2023	Program evaluation based on a conceptual framework	-	Defined AI literacy and evaluated an AI literacy programme based on a multi-dimensional conceptual framework.

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Definition of AI literacy for Typical Individual

AI literacy for a typical individual is the ability to comprehend, interact with, and make informed decisions regarding AI technologies in daily life. It involves understanding the basic principles of AI, recognizing its applications, and being aware of ethical, social, and privacy implications while responsibly engaging with AI systems.

Chan, CKY, 2023.

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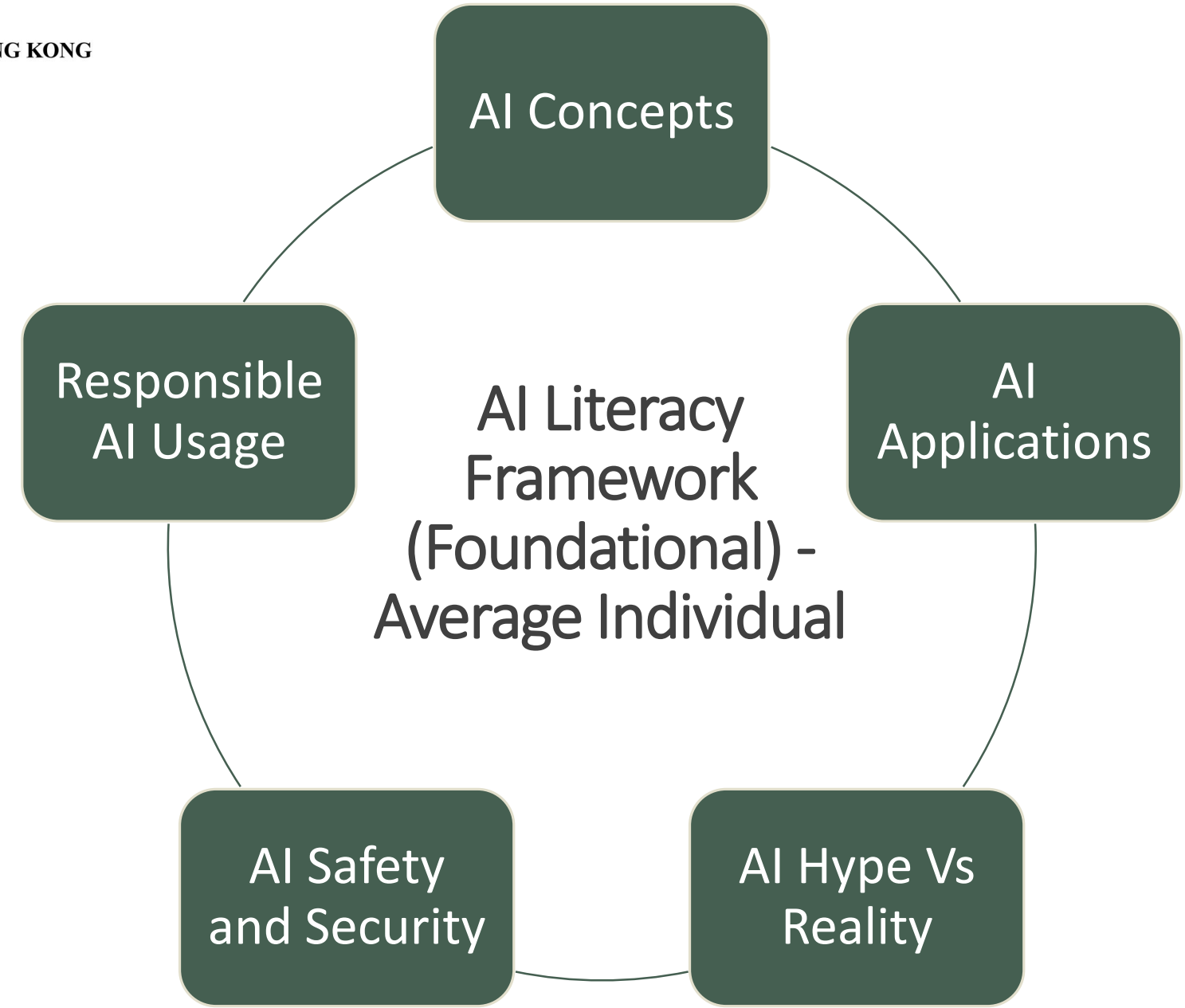

Chan, CKY, 2023

The Dynamic AI Literacy Model (DAIL-M) for Specific Roles

AI Concepts	• Familiarity with basic terminology (e.g., artificial narrow/general/super intelligence, machine learning, machine intelligence and machine consciousness) to facilitate comprehension of how AI systems function.
AI Applications	• Awareness of common AI tools and applications in everyday life, such as virtual assistants, recommendation systems, and facial recognition.
AI Hype Vs. Reality	• Differentiating between the true potentials of AI and 'hype' perpetuated by sensationalist marketing, in order to have realistic expectations of what AI can and cannot do.
AI Safety and Security	• Awareness of potential security risks associated with AI applications, including possible threats to personal data and misuse of technology.
Responsible AI Usage	• Developing a sense of responsibility when using AI applications, understanding that AI systems may have limitations including incorrect information (thus requiring fact-checking), considering ethical implications, and questioning the reliability of AI-generated content.

+

Additional AI Literacy Aspects Relevant to the Role

- High Level of Literacy
- Medium Level of Literacy
- Low Level of Literacy

Chan, CKY, 2023

AI Software Programmer/ A Medical GP

Would they need the same level of AI literacy?

CB INSIGHTS

AI 100

2022

Cross-industry applications

Manufacturing
LANDING AI
INSTRUMENTAL
elementary
fero labs

Warehouse automation
Agility Robotics
nimble
THIRD WAVE AUTOMATION

Sales & contact center
OBSERVE.AI
CRESTA
循环智能 RECURRENT AI

Search
Twelve Labs
YOU
jina

Cybersecurity
OBSIDIAN
CHEQ
Duality

Customer feedback analysis
unit

Location data
SAFEGRAPH

Worker safety & incident prevention
Urbint

Business intelligence
AIBLE
Pecan

Engineering design
NEURAL CONCEPT
Physna

IT & devops automation
harness
cast

Other R&D
sparkcognition
InstaDeep™

Industry-specific applications

Finance & insurance
zeni
Unit21
hazy
EvolutionIQ
feedzai
cervest
TRACTABLE

Retail
Depict
Afresh
nuro
Crossing Minds
cosmose AI
avataar

Healthcare
SWORD HEALTH
ACTIV SURGICAL
Rad AI
OWKIN
Syllable
healx
Insilico Medicine
Whisper
Curai Health
ALIFE

Telecom
DEEPSIG
net Ai

Aerospace & defense
SHIELD AI
MODERN INTELLIGENCE

Government
zencity

Auto
Waabi
Apex.AI
nodar
autox
PHIAR

Agriculture
regrow
IRONOX

Construction
BUILT ROBOTICS
CANVAS

Maritime
BEARING.ai

Gaming
99wp
inworld

Waste management
AMP ROBOTICS

Media
WELLSAID
SURREAL

AI development tools

AI chips
LUMINOUS
GRAPHCORE
UNTETHER AI
SambaNova SYSTEMS
ZM

Data annotation
sama
Snorkel

Synthetic data
gretel

Data de-identification
PRIVATE AI

Data quality & observability
SUPERCONDUCTIVE
Anomalo
MONTE CARLO

Version control & experiment tracking
iterative
neptune.ai
Pachyderm

Model validation & monitoring
LatticeFlow
TROJ.AI
ROBUST INTELLIGENCE
fiddler

ML platforms
anyscale
Unbox
ABACUS.AI
DataRobot

Machine learning deployment
OctoML

Resource optimization
run:ai

Computer vision
ENCORD

Natural language processing
Hugging Face
EXPLOSION
co:here
AI21labs

Note: Companies are private as of 4/29/22

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And what about Higher Education teachers?

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The Dynamic AI Literacy Model (DAIL-M) for University Teachers

- AI Concepts
- AI Applications
- AI Hype Vs. Reality
- AI Safety and Security
- Responsible AI Usage

AI Literacy Framework (Foundational)

+

1.
2.
3.
4.
5.
6.
7.

AI Literacy Specific Elements

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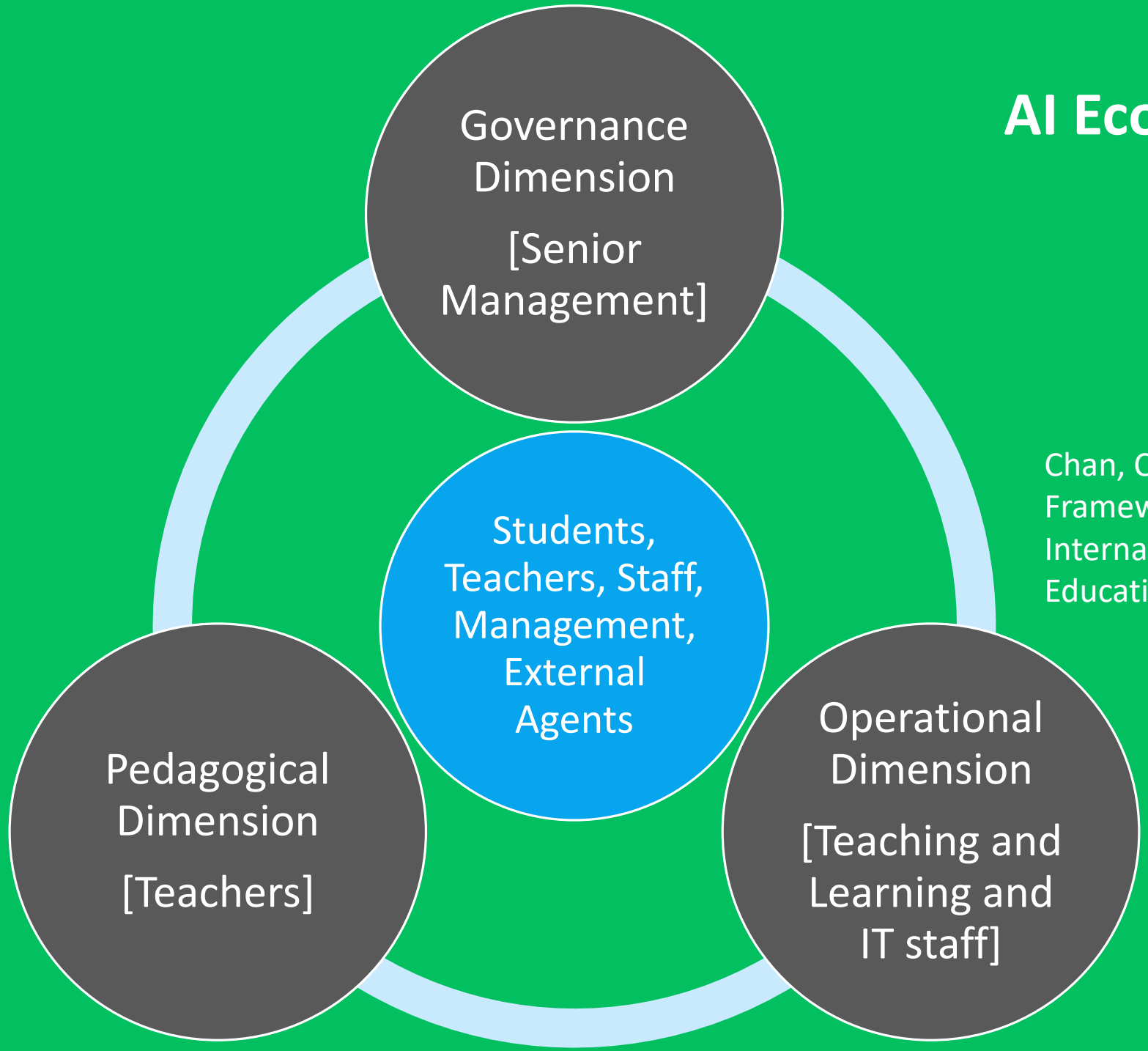
Our Questions on GenAI

1. Are we using it?
2. How should we use it?
3. Are we monitoring our usage?
4. Do we understand how it actually works?
5. Could excessive use lead to reliance on it?
6. Might it replace us?
7. Could it diminish our opportunities to develop generic skills or even human values?
8. Should there be regulation?
9. Would there be constant monitoring of such regulation?

Chan, C.K.Y., & Hu, W. (2023). Students' Voices on Generative AI: Perceptions, Benefits, and Challenges in Higher Education. *International Journal of Educational Technology in Higher Education.* [in press]

SCAN ME

AI Ecological Education Policy Framework



Chan, C.K.Y. (2023). A Comprehensive AI Policy Education Framework for University Teaching and Learning. International Journal of Educational Technology in Higher Education. DOI : 10.1186/s41239-023-00408-3

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Governance Dimension

1. Understanding, identifying, and preventing academic misconduct and ethical dilemmas
2. Addressing governance of AI: data privacy, transparency, accountability, and security
3. Attributing AI technologies
4. Ensuring equity in access to AI technologies

Senior Management

Operational Dimension

1. Monitoring and evaluating AI implementation
2. Providing training and support for teachers, staff, and students in AI literacy

Teaching and Learning and IT staff

Pedagogical Dimension

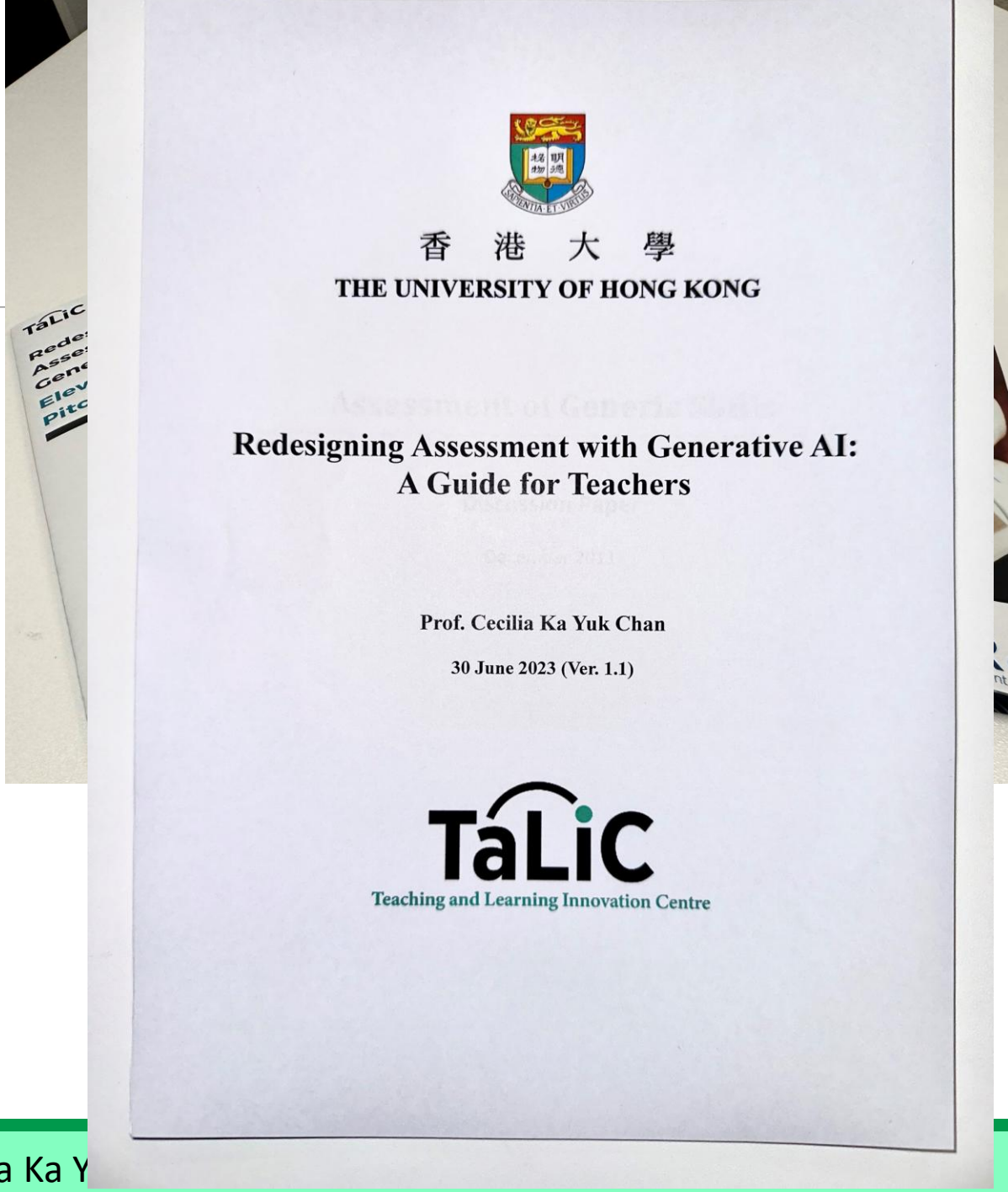
1. Rethinking assessments and examinations
2. Developing student holistic competencies/generic skills
3. Preparing students for the AI-driven workplace
4. Encouraging a balanced approach to AI adoption

Teachers

University Support

Redesigning Assessment with Generative AI: A Guide for Teachers - Five Steps to AI-integrated Assessment Redesign, Attribution to AI, Scenarios for Assessment Redesign

WhatsApp Hotline - Hotline specifically for GenAI Teaching and Learning.



AR@HKU website

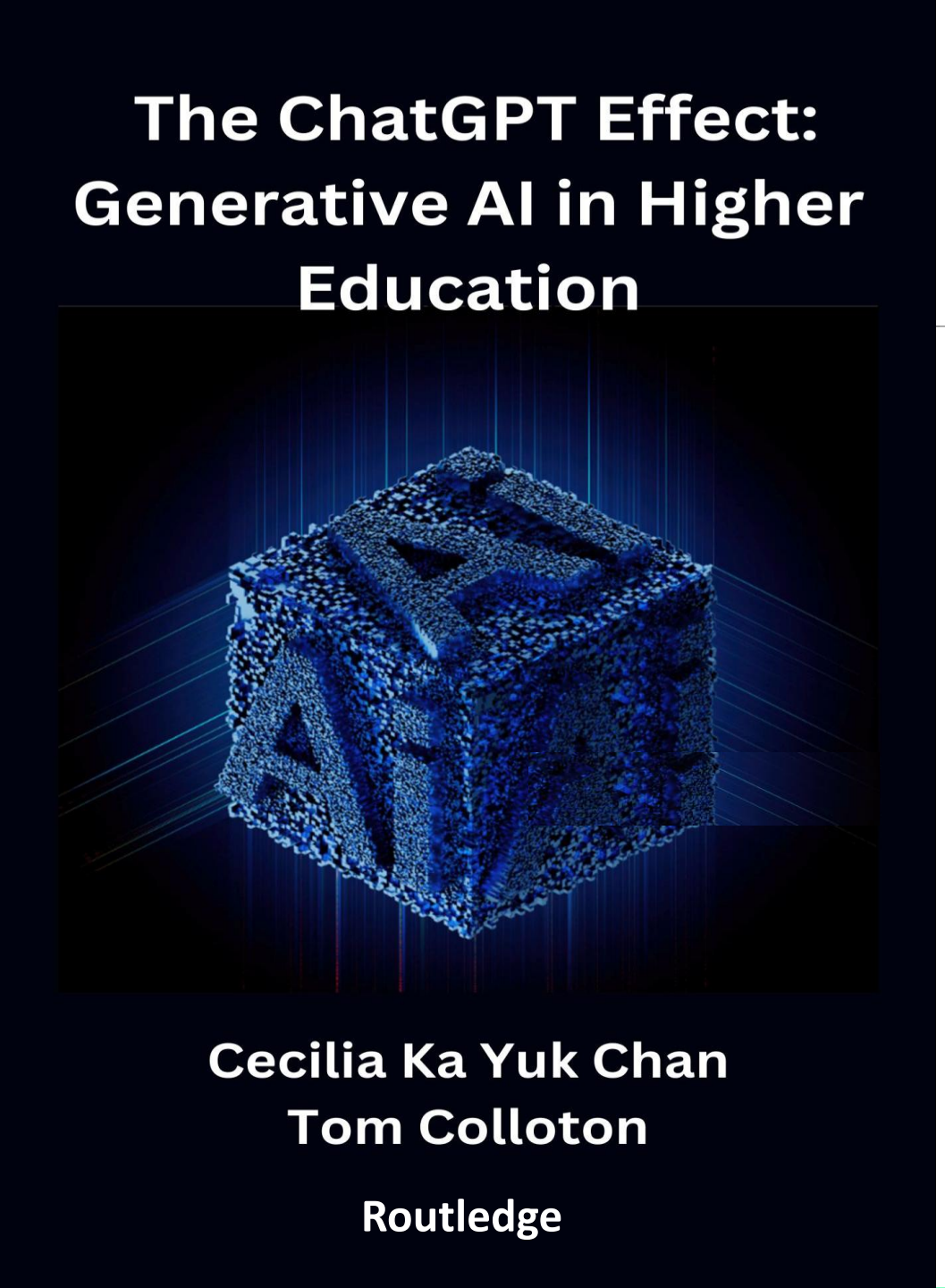
University Support

HKU AI Clinic - The clinic is staffed with colleagues from TALIC and trained students for one-to-one support, including downloading apps or trying out image, text, or video GenAI applications.

AI in Education Website (AIED@HKU) - A dedicated website will be launched around September/October this year to provide additional resources.

AI-Literacy Self-paced Online Course - We have developed an AI literacy course for all HKU students and staff.

Rethinking our pedagogy not just assessment but the learning process



Book: Table of Contents

Ch 1 Introduction to Artificial Intelligence in Higher Education

Ch 2 AI Literacy

Ch 3 Strengths and Weaknesses in Embracing ChatGPT in Curriculum Design

Ch 4 Redesigning Assessment in the AI Era

Ch 5 Developing an AI in Education Policy

Ch 6 Technology Behind GenAI

Ch 7 The Future of Artificial Intelligence in Education

A List of Pedagogies Facilitated by AI-Human Partnership

Teaching	
Function	**Implementation & Example**
Create syllabi	**Implementation**: Use AI to generate a structured syllabus based on course goals. **Example**: For a physics course, AI can generate weekly topics, readings, and assignments tailored to the course objectives.
Produce course documents	**Implementation**: AI tools can auto-generate course outlines, schedules, and reading lists. **Example**: For a history course, generate an outline of topics from ancient to modern history, detailing weekly themes and readings.
Customise lesson planning	**Implementation**: AI can adjust lesson plans based on student feedback or performance. **Example**: If students struggle with photosynthesis, extend the topic by two lessons and include additional resources.
Produce learning outcomes	**Implementation**: Define clear objectives for each lesson using AI analysis of course content. **Example**: For a math module on algebra, the outcome might be "Students can solve linear equations with one unknown."
Develop rubrics	**Implementation**: Design assessment criteria with the help of AI. **Example**: For an essay on Shakespeare, the AI might suggest criteria like clarity of thesis, textual evidence, analysis quality, and grammar.
Develop course materials	**Implementation**: AI tools can curate and create reading materials, videos, and interactive elements. **Example**: For a computer science course, AI could gather relevant articles on emerging technologies and design interactive coding challenges.
Put together references	**Implementation**: AI can scan vast databases to collate a bibliography. **Example**: For a research paper on climate change, the system could pull the most cited and relevant articles from the last decade.

Table 3.13 A list of AI-human partnered pedagogies separated into Teaching, Learning, Research and Administrative categories.

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AI in Education

History has shown us that when technologies are used appropriately and judiciously, they work alongside us to improve our way of living. Whether AI technology is a game-changer for us or a Pandora's box does not matter. What matters is how we can leverage this opportunity while remaining ethical. We need to use our imagination and be Future Ready. The question is, are you ready to move forward with it?

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Thank You

If you wish to contact me for further information

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