The AI Transformation: Skills Needed to Navigate the New Landscape

– Nurturing of talents in the 21st century –

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Future Literary

Futures studies is the systematic, interdisciplinary and holistic study of social/technological advancement, and other environmental trends; often for the purpose of exploring how people will live and work in the future.

Future Studies

Preparing Learners for Success in the 21st Century

VUCA vs BANI

A NEW ACRONYM TO DESCRIBE THE WORLD

Serves to describe the situation of Ambiguity and Complexity

Serves to describe the situation of the Next Generation of Business

揮發性	V	VOLATILITY	←	BRITTLE	B	脆弱性
不確定性	U	UNCERTAINTY	←	ANXIOUS	A	焦慮性
複雜性	C	COMPLEXITY	←	NON-LINEAR	N	非線性
模糊性	A	AMBIGUITY	←	INCOMPREHENSIBLE	I	難理解性

Future World

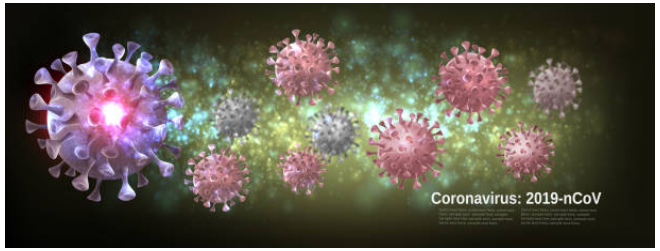
CALVIN

(coined by Haydn Chen)

2024 new acronym for the world of future

The Most Impactful World Events in Recent Years

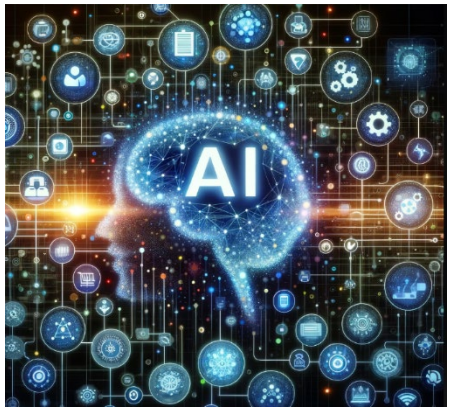
- COVID 19 – 2020



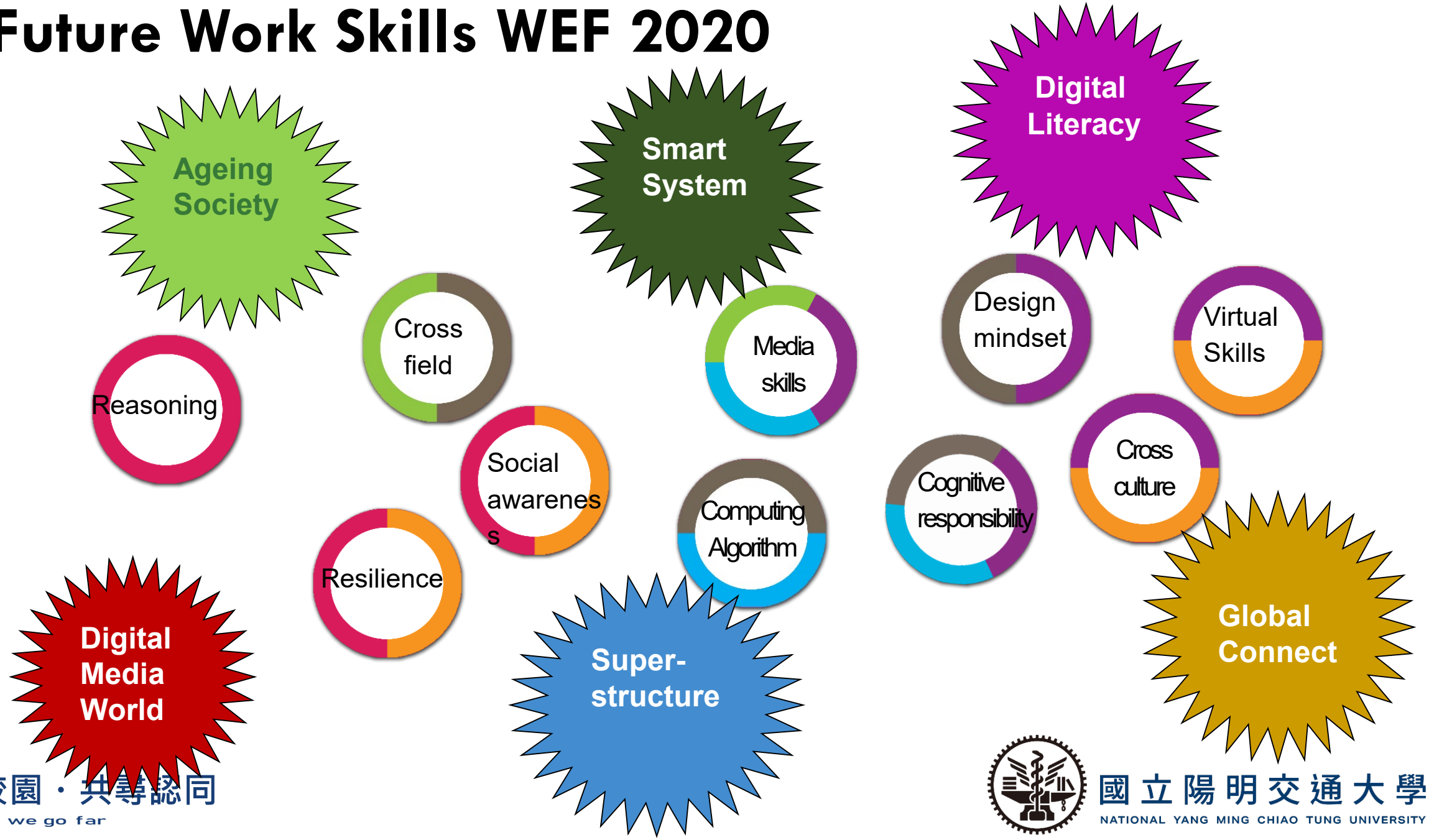
- Ukraine and Russia War - 2022

- Israel – Hamas War - 2023

- Artificial Intelligence (AI) - 2023



Future Work Skills WEF 2020



2025 - Half of the global workforce need re-education to acquire the following working skills (WEF)

6. **Leadership & social influencing impact** 領導和社會影響
7. **Technology mastering** 掌握科技應用素養
8. **Design of technology and software** 設計技能和軟體應用
9. **Positive thinking, adjustability & resilience** 正面思考適應性和韌性
10. **Reflect, determine and solve mindset** 反思決心和思維

Soft Skills

Soft Skills

Soft Skills

Soft Skills

Soft Skills

Soft Skills

Soft Skills

Soft Skills

Soft Skills

Soft Skills

Soft Skills

人本校園・共尋認同

Together we go far

國立陽明交通大學

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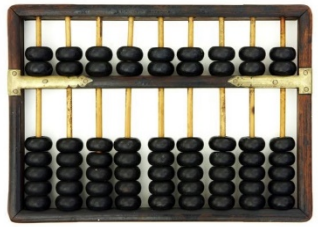
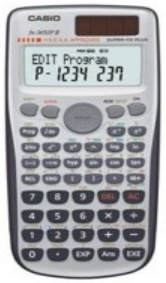
Encountering AI Era, Metaverse !!??



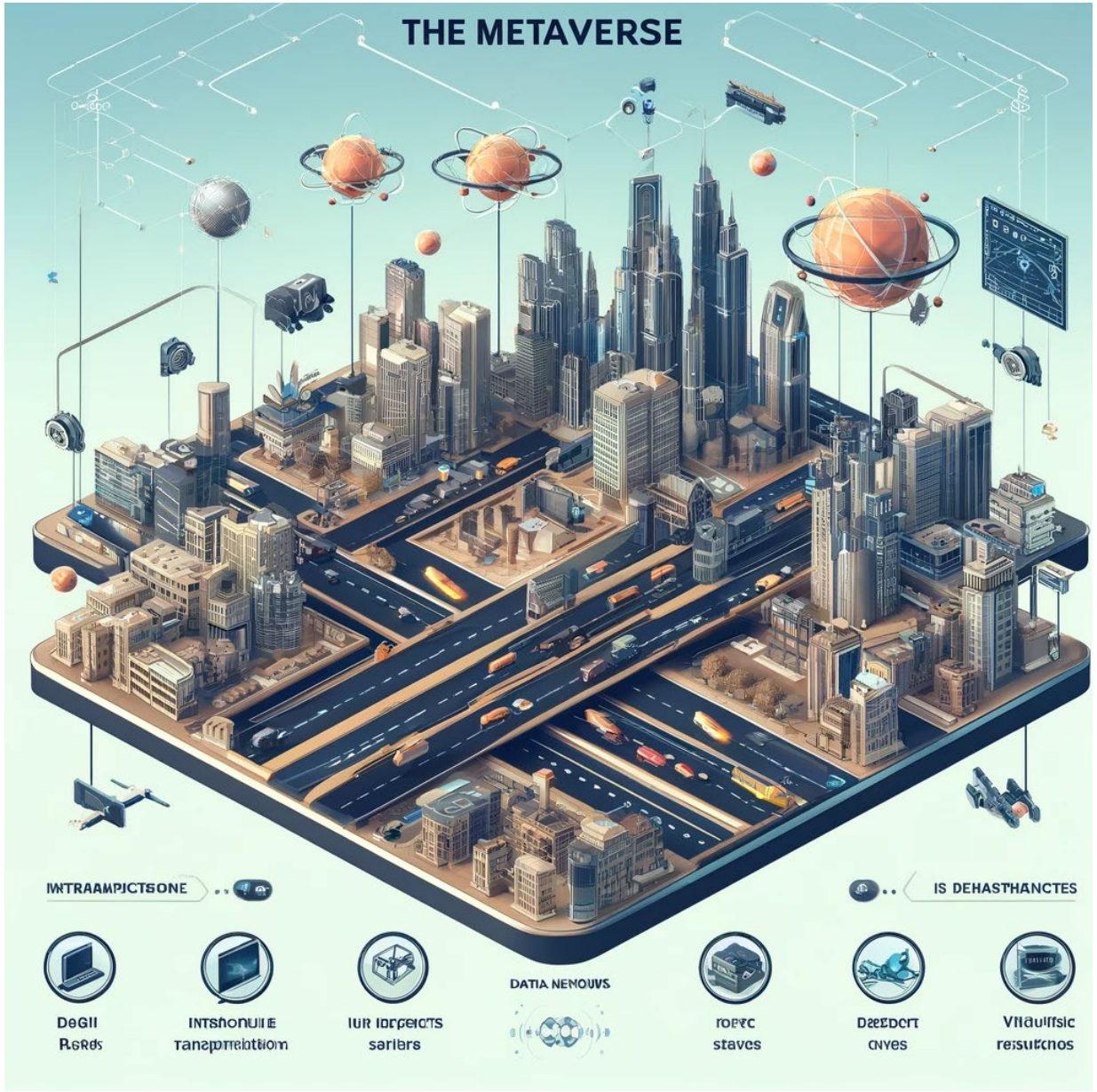
Slide rule (計算尺)

Calculator (計算器)



An infographic, generated by ChatGPT, illustrating the Metaverse as the infrastructure of a city.

It includes elements such as digital roads representing data networks, buildings as servers, public spaces as user interfaces, and virtual reality platforms as transportation systems, all set in a futuristic cityscape. This visual helps depict how users navigate, interact, and experience a virtual world in the Metaverse.



An infographic, generated by ChatGPT, illustrating AI as the inhabitants of a Metaverse city.

It depicts various AI-driven entities like chatbots, virtual assistants, and interactive systems as characters populating the city, performing roles such as service providers, social interactors, operational managers, and creative contributors. This vibrant and dynamic city scene captures the bustling, advanced technological environment of the Metaverse, filled with AI characters interacting and contributing to city life.

A Century of Technological Development: From Quantum Mechanics to AI & Metaverse (1/2)

- **Early 1900s:**
  - Birth of **quantum mechanics**, providing the theoretical foundation for future innovations.
- **1920s:**
  - Discovery **of electronic band structure and band gaps**, key for semiconductor technology.
- **1947- 48:**
  - Invention of **transistors** at Bell Labs in 1947, revolutionizing electronic devices.
  - Introduction of the first **programmed software** by Kilburn in Manchester in 1948, marking the beginning of software development.
- **1950s:**
  - Start **of integrated circuits (IC)**, miniaturizing and enhancing the performance of **e-devices**.
  - Emergence of transistor-based **commercial computers**, setting the stage for the computing revolution.
  - The term **"artificial intelligence (AI)"** was coined by John McCarthy in 1956.
- **1970s:**
  - Advent of personal computers (**PCs**), laptops, tablets, and the **internet**, significantly impacting personal and professional lives.

A Century of Technological Development: From Quantum Mechanics to AI & Metaverse (2/2)

- **1980s:**
  - Introduction of **wireless digital communication**, further connecting the world.
- **1997:**
  - IEEE802.11 **Wi-Fi** 2 Mbps, enabling wireless access to the internet and data transfer.
- **2000 onwards:**
  - Rapid development and adoption of **smartphones, VR (Virtual Reality), AR** (Augmented Reality), XR (Extended Reality), and next-generation **wireless technologies** (5G, 6G).
  - **AI** (Artificial Intelligence), and the concept of the **Metaverse** start gaining traction.
- **2010s:**
  - Advances in computing power and algorithms facilitate significant progress in machine learning and perception.
  - Deep learning methods begin to dominate accuracy benchmarks due to the availability of large data sets.
  - A rise in affordable neural network technologies, spurred by improvements in cloud computing infrastructure and the availability of research tools and datasets.
  - **AI** research accelerates, becoming a central focus for the development of the **future Metaverse**.

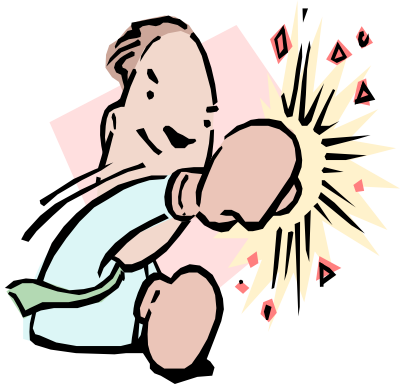
A historical account of Artificial Intelligence (AI)

- **Early 20th Century**: The formalization of logic and the invention of the digital computer in the 1940s by Alan Turing and others set the stage for AI research.
- **1950s - 1960s**: The term "artificial intelligence" was coined by John McCarthy in 1956.
- **1970s - 1980s**: This period focused on rule-based systems and the development of expert systems designed to mimic the decision-making abilities of a human expert.
- **1990s - Early 2000s**: Renewed interest in machine learning emerged, with improvements in algorithms and an increase in computational power. Neural networks began to be used for various applications, setting the stage for the deep learning revolution.
- **2010s - Present**: AI has experienced rapid growth thanks to advances in deep learning, big data, and computational power. AI systems like GPT (Generative Pre-trained Transformer) and image recognition technologies.

30+ AI TOOLS
YOU CAN'T IGNORE FOR 2024

CATEGORY	TOOLS			
AI Bot	ChatGPT	Google Bard	Bing AI	Claude
Video Creation	Runway	HeyGen	Veed.io	Pictory
Images	Midjourney	DALL-E 3	Leonardo.ai	Firefly
Presentation	Beautiful.ai	Slides.ai	Decktopus	Tome
Research	Harpa	Perplexity	ChatPDF	Glasp
Prompt Writing	PromptPal	G-Prompter	Snack Prompt	OctiAI
Productivity	Taskade	Audio Pen	Notion Ai	Xembly
Writing	Wordtune	Grammarly	Jasper Ai	Copy.ai

Don't believe us? See for yourself in a personalized demo for your team.



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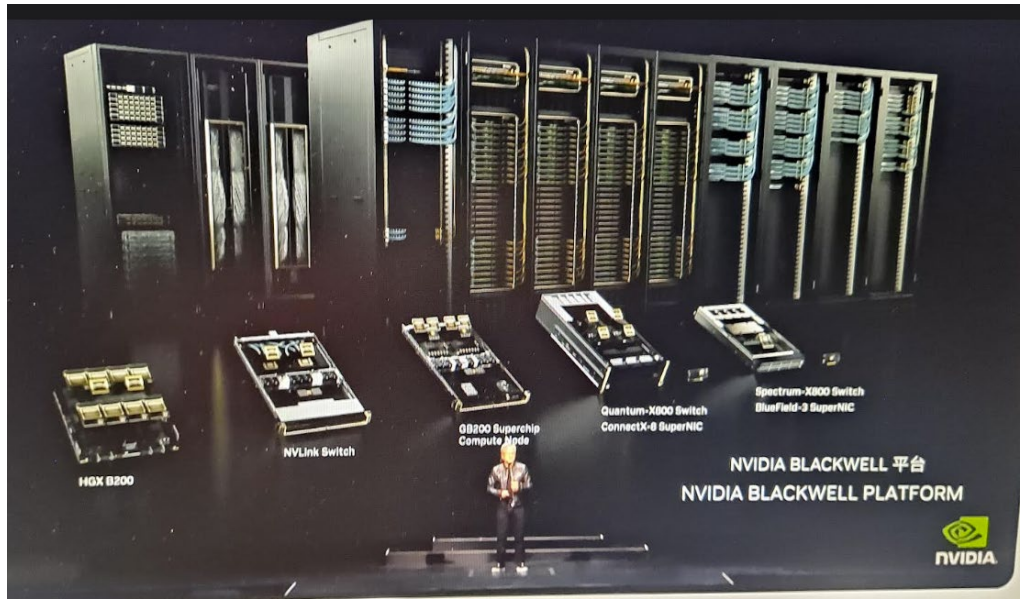
AI could shake up job market by 2030, McKinsey reveals list of sectors that will be impacted

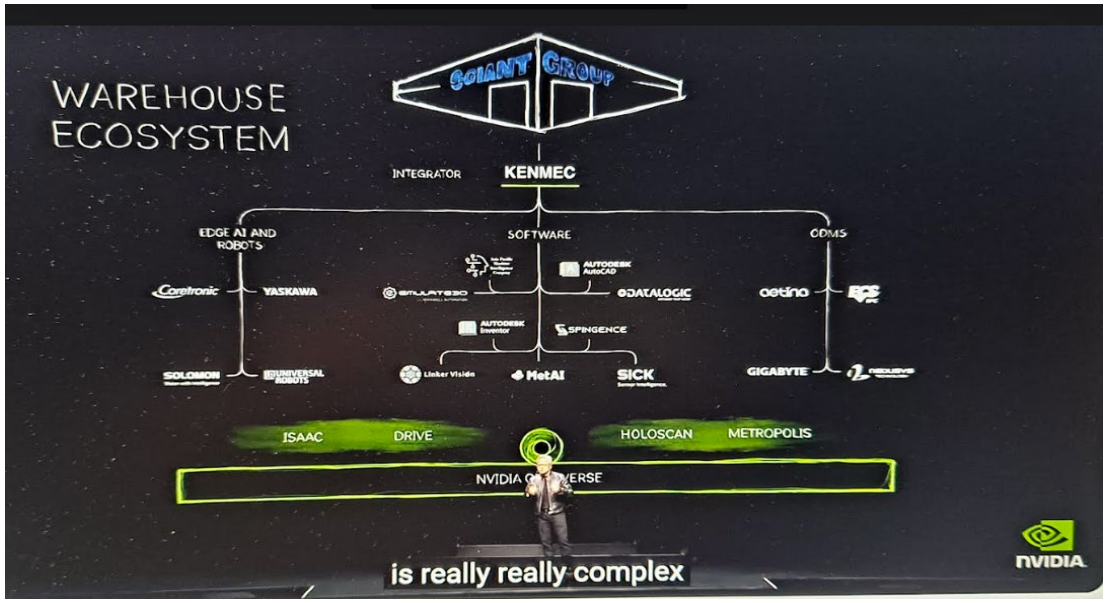
AI is set to cause significant changes in the job market over the next decade. According to a McKinsey report, AI will lead to around 12 million occupational transitions by 2030.

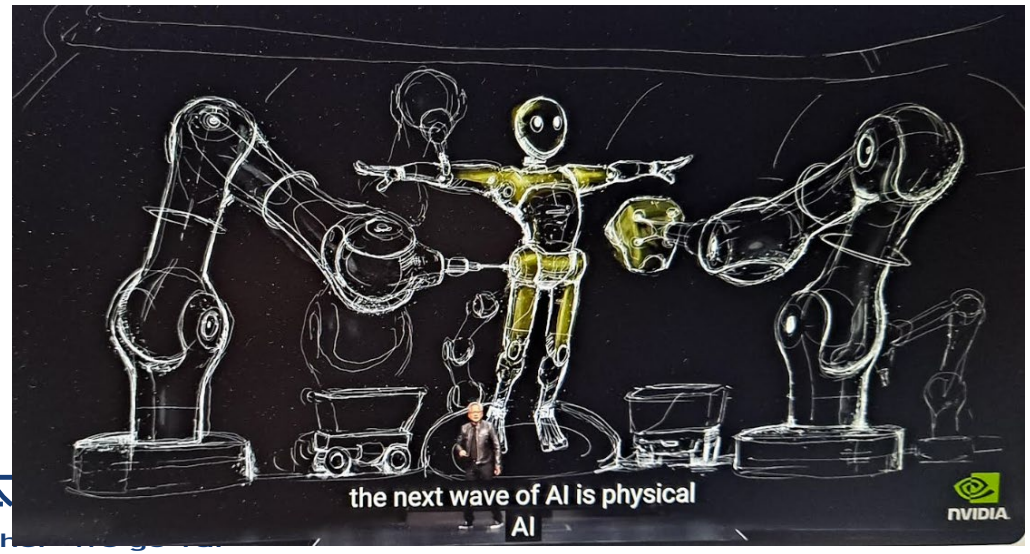
In Short

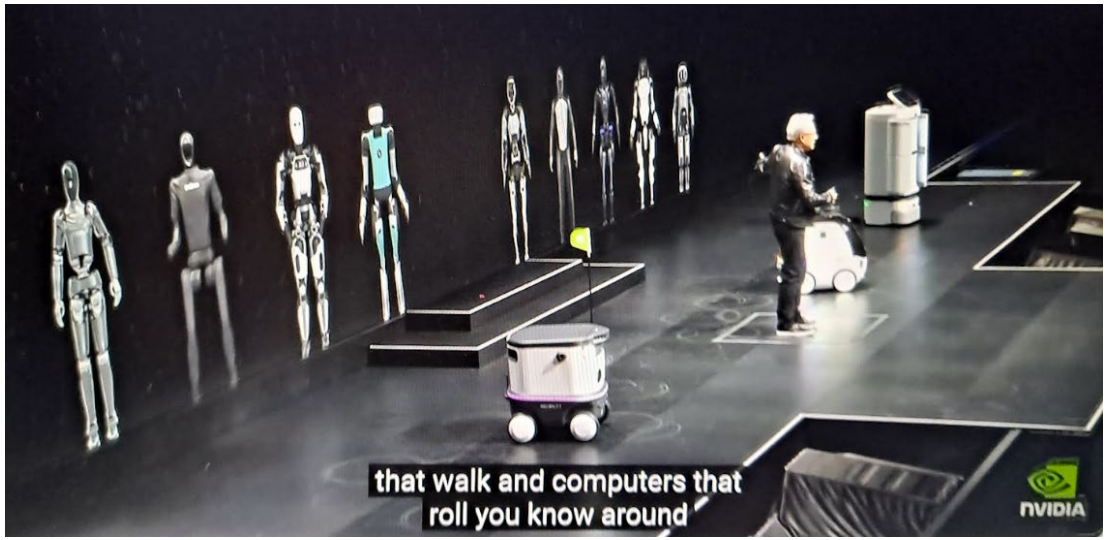
- AI could cause 12 million job transitions by 2030
- Healthcare and STEM sectors are expected to see growth
- 30 percent of tasks will adapt to AI technology changes

Jensen Huang of NVIDIA Keynote at COMPUTEX 2024









Impact of AI and Metaverse on Professionals

- Transformation & Adaption -

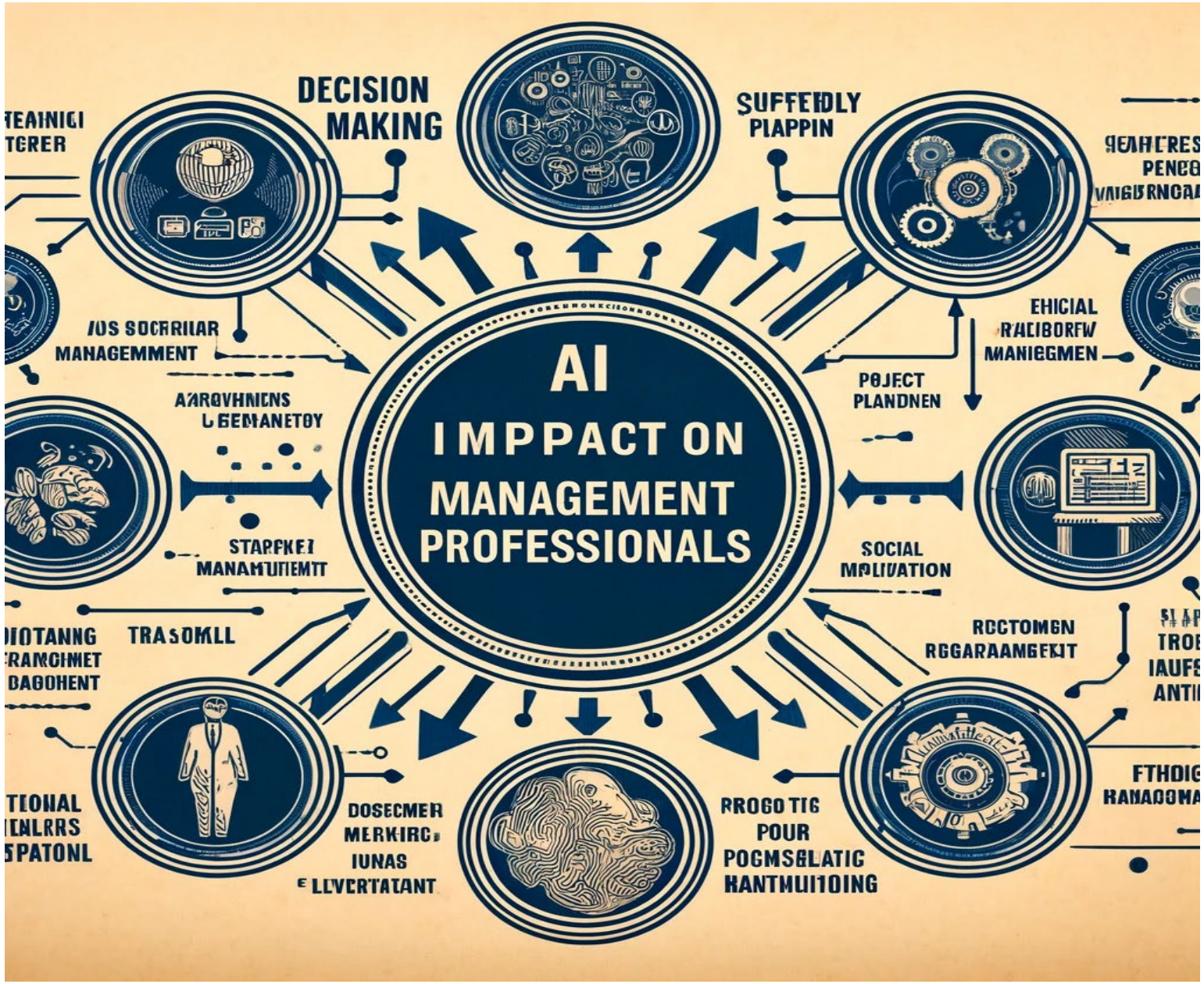
Applications of AI

- Medical AI System
- Powered Fraud Detection
- AI in Manufacturing
- AI in Finance
- AI in Retail
- Autonomous Vehicle
- AI in Energy
- Precision Farming
- AI Music Recommendation
- AI Language Learning
- AI in Education
- AI Cybersecurity
- AI in Biodiversity
- AI Legal Research
- AI Social Media Feed
- AI in Telecommunications
- AI in Smart City
- AI in Defense
- AI Mars Rover
- ……

AI Impact on Management Professionals

Key areas of impact and the need for adaptation and skill acquisition:

- *Decision Making*
- *Automation*
- *Human Resource Management*
- *Marketing*
- *Supply Chain Management*
- *Financial Management*
- *Project Management*
- *Strategic Planning*
- *Customer Relationship Management (CRM)*
- *Ethical and Social Implications*



AI Impact on Legal Professions

Most likely to be replaced:

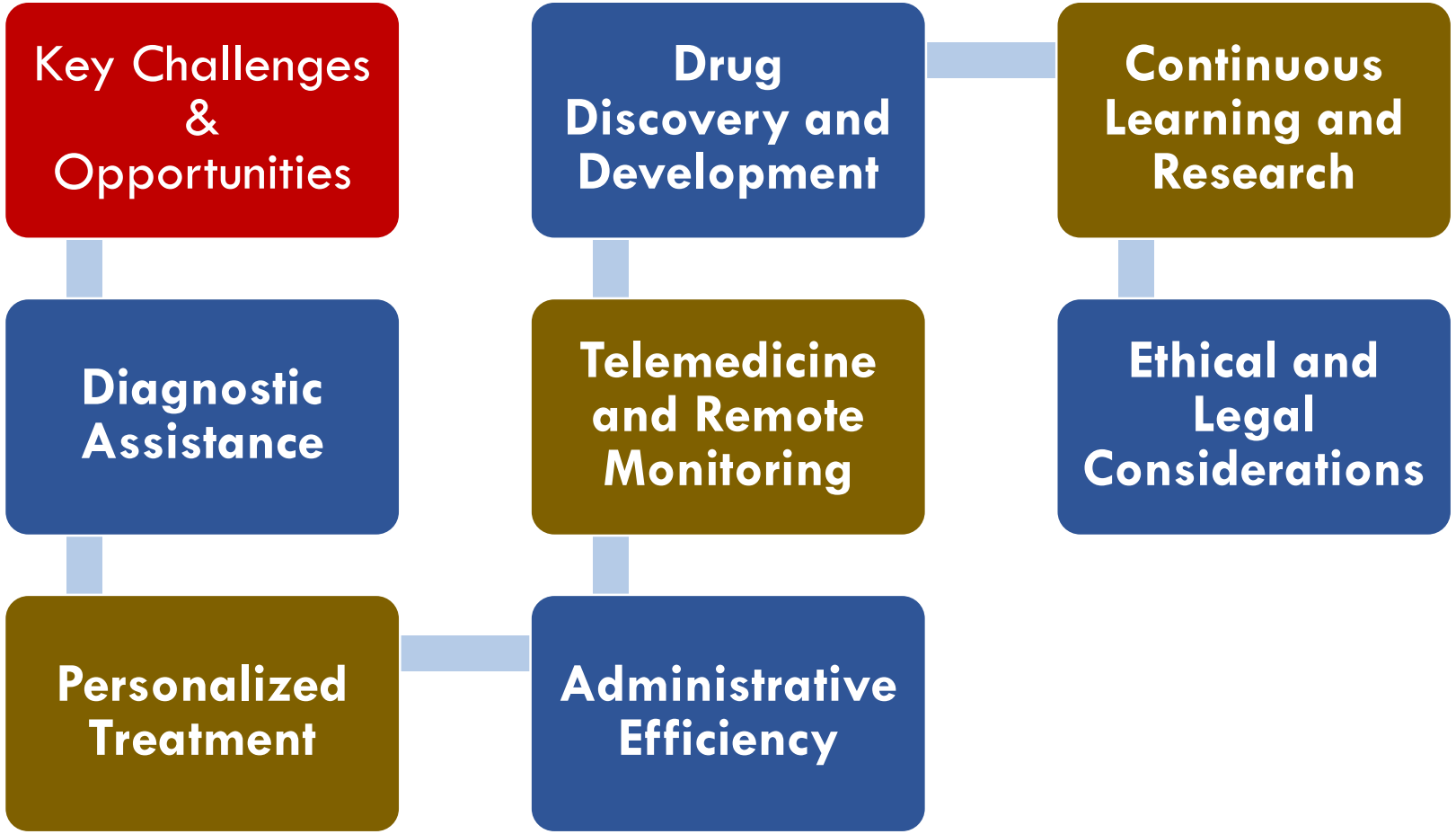
- Document Review and Due Diligence
- Legal Research
- Contract Analysis
- Basic Legal Drafting

Least likely to be replaced:

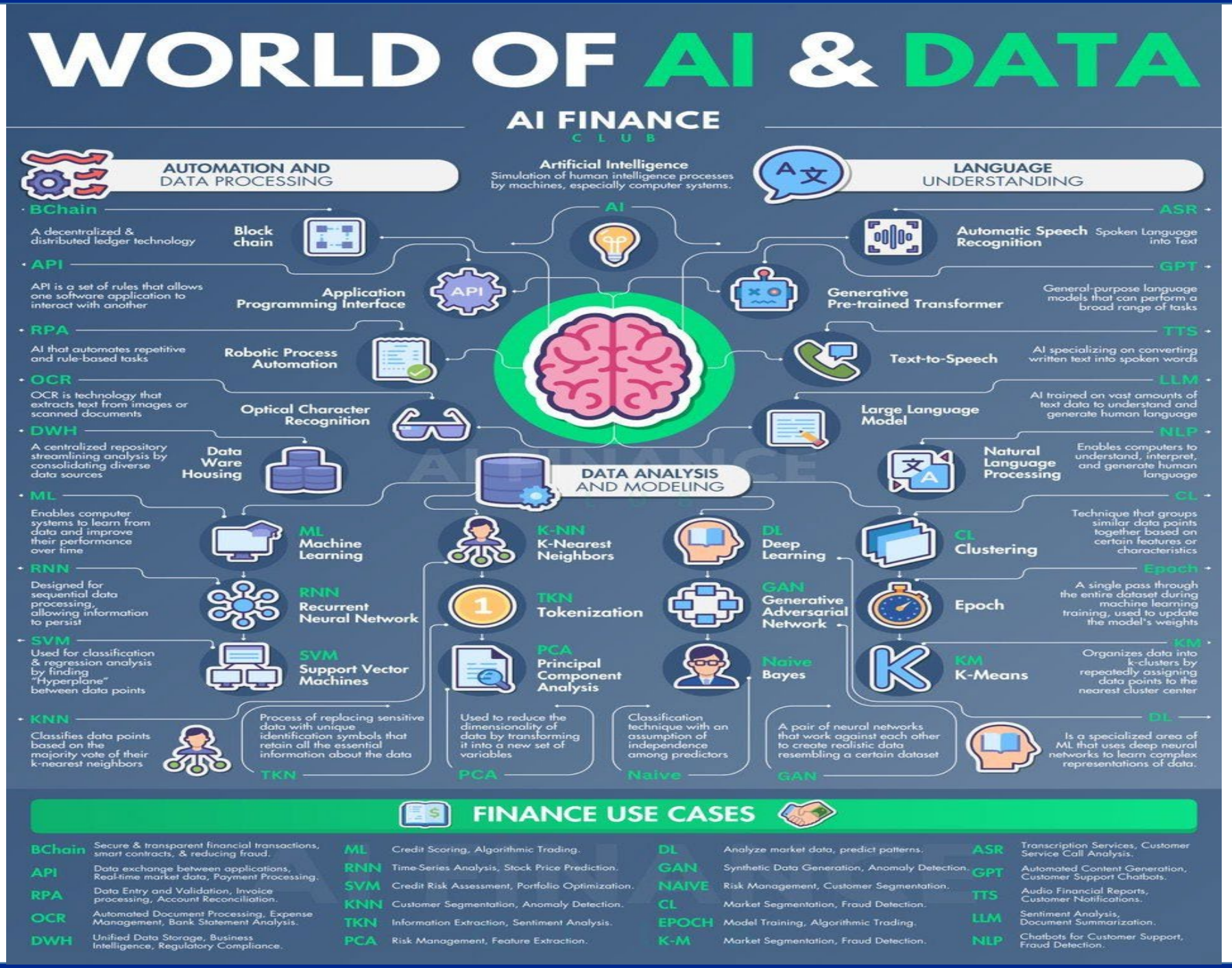
- Trial Lawyers and Litigator
- Negotiators and Mediators
- Legal Strategists and Advisors
- Specialized Legal Consultants

AI Impact on Medical Professionals

AI's ability to **automate routine** tasks, such as analyzing medical images or managing large datasets, allows medical professionals to focus on more complex and nuanced aspects of patient care. However, this shift may lead to **changes in job responsibilities** and a **reduced demand** for certain technical roles.



AI Impact on Finance Professionals

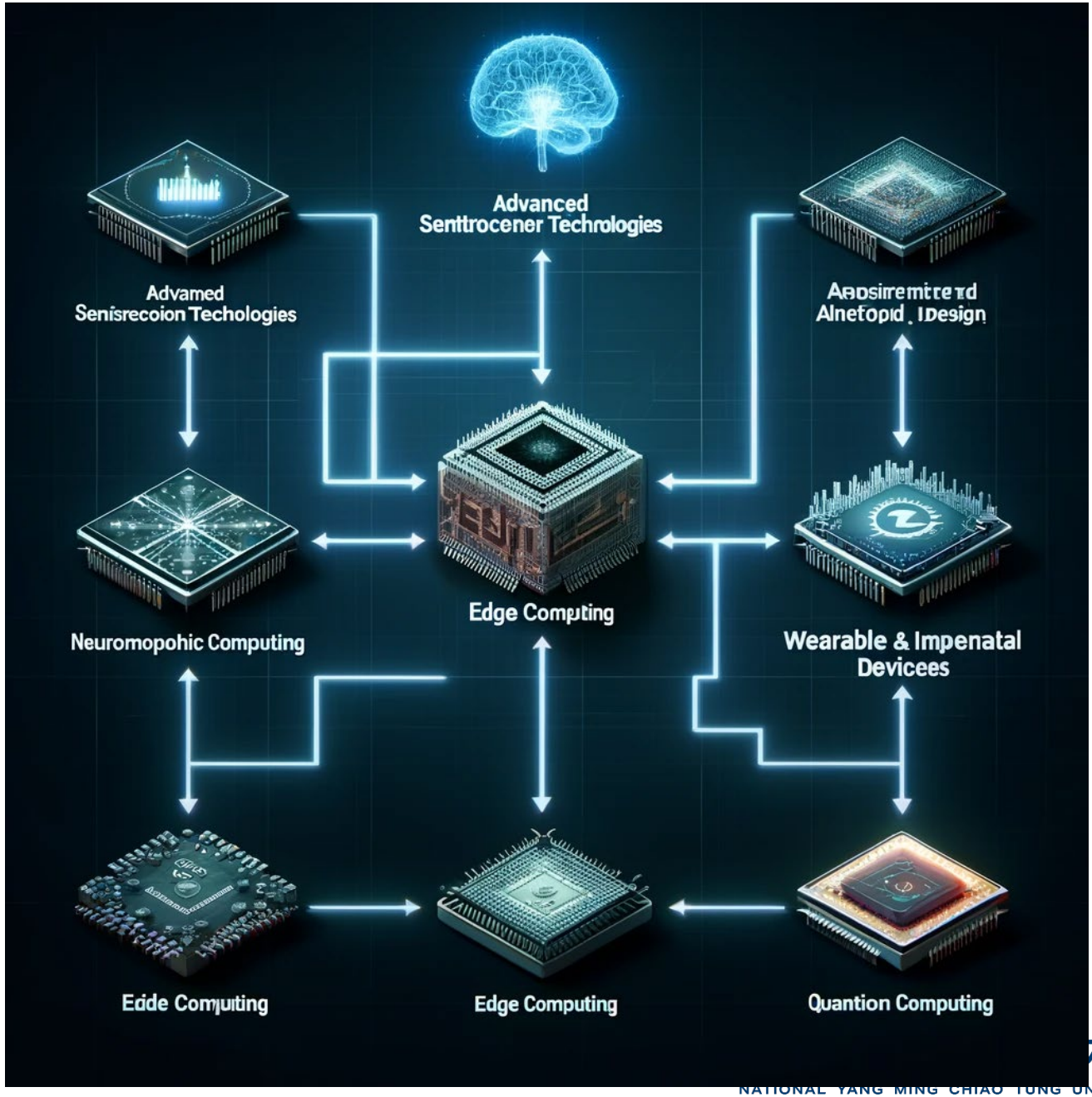


AI Impact on Microelectronics

(Generated by ChatGPT)

A list of the key points here:

- Advanced Semiconductor Technologies
- Integrated Circuits (IC) Design
- Edge Computing
- Neuromorphic Computing
- 3D Packaging and Integration
- Wearable and Implantable Devices
- Quantum Computing



AI Impact on Computer Science Professionals

This illustration highlights the dynamic and innovative environment where diverse professionals are engaged in coding, programming, and collaborative discussions, supported by AI-driven tools and automation. This image captures both the technical and collaborative aspects of their work in an AI-enhanced setting.

Skills Required for Computer Science Professionals in the AI Era

Hard and Specialized Skills

- Technical Skills
  - Machine Learning
  - Deep Learning
  - Natural Language Processing (NLP)
  - Data Science
  - Programming
- Interdisciplinary Knowledge:
  - Mathematics and Statistics
  - Domain-Specific Expertise

Soft Skills

- Work Efficiency and Productivity
- Innovation and Research
- Ethical and Social Implications
- Continuous Learning and Adaptation
- Communication and Interpersonal Skills
- Global Perspective
- Passion and Enthusiasm

Soft Skills

Soft Skills

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人本校園・共尋認同

Together we go far

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What are Soft Skills?

LinkedIn Learning

The Six C's | 21st Century Lifelong Skills

TIME TO KNOW
www.timtoknow.com

Critical Thinking-and-Doing

Component Skills

Problem-solving, Research, Analysis, Project Management, etc.

思辨力

Creativity

Component Skills

New knowledge creation, "Best Fit" Design Solutions, Artful Storytelling, etc.

創新力

Collaboration

Component Skills

Cooperation, Compromise, Consensus, Community-building, etc.

團隊力

Communication

Component Skills

Crafting Messages and Using Media Effectively.

溝通力

Computer Literacy

Component Skills

Effective use of Electronic Information and Knowledge Tools.

資訊力

Career and Learning Self-Reliance

Component Skills

Managing Change, Lifelong Learning and Career Redefinition.

終身/自主學習

Macro-View of Soft Skills 以大面向看軟實力:

- ✓ Behavior 行為
- ✓ Expression 表現
- ✓ Attitude 態度
- ✓ Character 品格
- ✓ Values 價值
- ✓ Expectation 嚮往
- ✓ Culture 文化
- ✓ Mechanism 機制
- ✓ Policies 政策
- ✓ Organization 組織
- ✓ Products 產品
- ✓ Labor 勞務
- ✓ Infrastructure 建設
- ✓ Power/Strength國力

Micro-Practices of Soft Skills 以小面向看軟實力:

- **Loving, forgiving, respective, sincere attitude**
  一種愛心、包容、尊重、認真的態度
- **Equal, embracing, law-abiding, humanistic mindset**
  一種平等、博愛、守法、具人文關懷的精神
- **Open, innovative, positive, active-learning motivation**
  一種開放、創新、積極、好學的動力
- **Character, values, practices, attitude being gracious & elegant**
  一種品格、價值、行為、態度的典雅

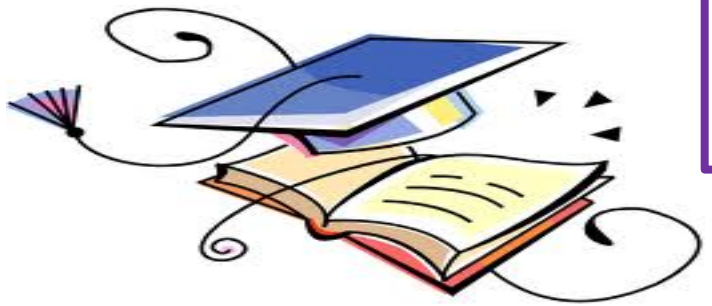
How to nurture Soft Skills?

Diverse Ways to Learn

✓Courses & Training	課程訓練
✓Learning by Doing	做中學習
✓Learning how to Learn	學會學習
✓Explore Learning	探索教育
✓Healthy Living	健康生活
✓Culture Engagement	文化參與
✓Global Experience	國際經歷

✓ Activities	活動參與
✓ Self-learning	自我學習
✓ Lifelong learning	終身學習
✓ Team work	團隊合作
✓ Communication	溝通協調
✓ Lead and serve	領導服務
✓ Civic responsibility	公民責任

Everywhere is a Classroom
處處是教室



Everyone is a Teacher
人人是老師

Key Elements of Nurturing Soft Skills

- Is the Mean, not the End 是過程而非目的
- Is Sustainable, not Instant 是永續而非速成
- Is the Whole, not the Parts 是整體而非片段
- Is Inner Growth, not Superficial 是內化而非外現
- Is what one Does, not Knows 是我行而非我知
- Is Spiritual Sublimation, not Solidification 是昇華而非固化
- Is Self, not Pretentious 是自我而非矯情


Interpersonal, Scope, Cooperation,
International Exchange
Equip special skills, Resilience
Attentive Discipline Learning
Interpersonal, Scope, Responsibility,
Social Civil
Develop broad interest
Extra - Curriculum, General Ed
Starting Now
Communicate, Co-op, Problem-solving, Resilience
Intern-ship
Communicate, Cooperation, Team
Clubs
Communicate, Co-op, Problem-solving, Resilience
Service Learning
Cross discipline Perseverance,
Work Study
Major & Minors
Interpersonal, Co-op, Problem-solving
University Lived and learned!

Purposes of Learning

Universities, Companies, Life-long Learning, Society Responsibilities

Goals of education

Should the useful in life, or should virtue, or should the higher knowledge be the aim of our training? - *Aristotle*

The goal of education is to produce educated and civilized person.

培養一個有教養和有教育的人

This requires an integration of learning of hard and soft skills.

University Must Provide Students with Whole Person Education Programs

- **Hard Skills (Specialty Learning)**
  - Specific knowledge, techniques, theories, training etc. in a given specialized discipline/major
- **Soft Skills (Liberal Arts Learning)**
  - Other abilities and practices, virtues and attitude as outlined

Smart Power = Hard Skills + Soft Skills

4 Important Components of Education

Virtual Learning & Hybrid Learning

The Evolution Approach of Education Industry

Demand-driven approach

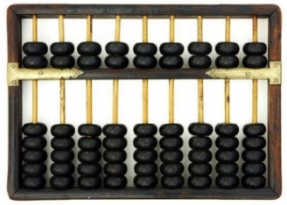
- Education-oriented

Creativity-driven approach

- Vision, ideology, insight, curiosity .

Hi-Tech-driven approach

- Hi-Tech-lead



Slide rule (計算尺)

Calculator (計算器)

Internet, WiFi, 5G. LLM, Machine Learning, AI...

Hybrid Leaning

混成式複合性學習

Combines virtual learning with real-person interactions

Some Advantages in Virtual Learning

- Flexibility
- Collaboration
- Accessibility
- Diverse Learning Resources
- Personalization
- Data-Driven Insights
- Scalability
- Global Perspective
- Cost-Effectiveness
- Continuous Learning

Enhancing Communication Skills in a Virtual Environment

在虛擬環境中強化溝通技巧

- Active Listening Exercises
- Nonverbal Communication Awareness
- Virtual Role-Playing Scenarios
- Virtual Communication Training
- Utilize Breakout Rooms
- Feedback and Reflection

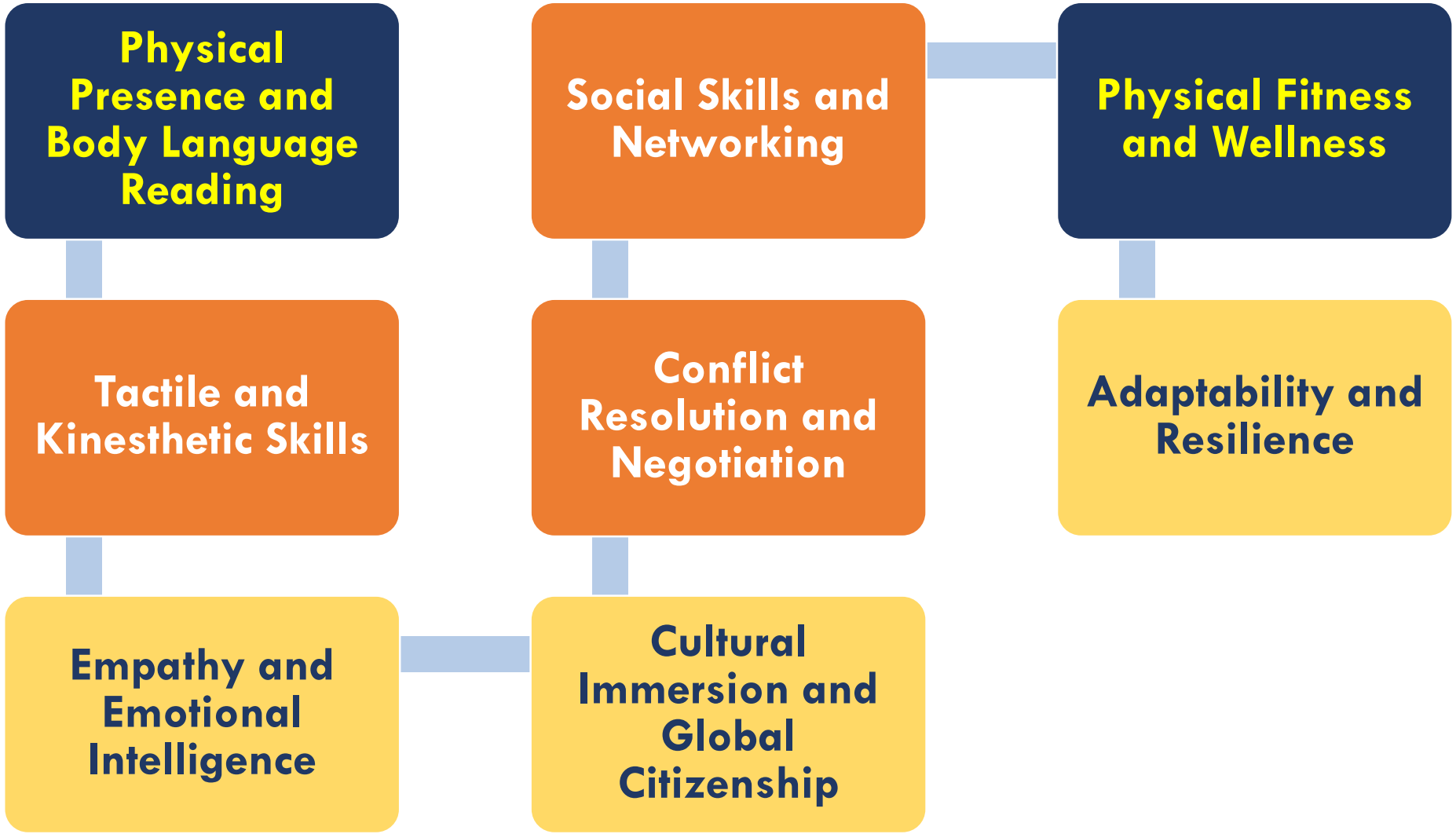
Nurturing Practical Skills in Virtual Environments

在虛擬環境中培育實務技能

- Virtual Laboratories and Simulations
- Virtual Field Trips
- Interactive Virtual Workshops
- Gamification and Serious Games
- Remote Internships
- Project-Based Learning
- Digital Maker Spaces
- Peer-to-Peer Learning Networks
- Coding Environment
- Digital Art and Design Tools

Challenges in Virtual Learning

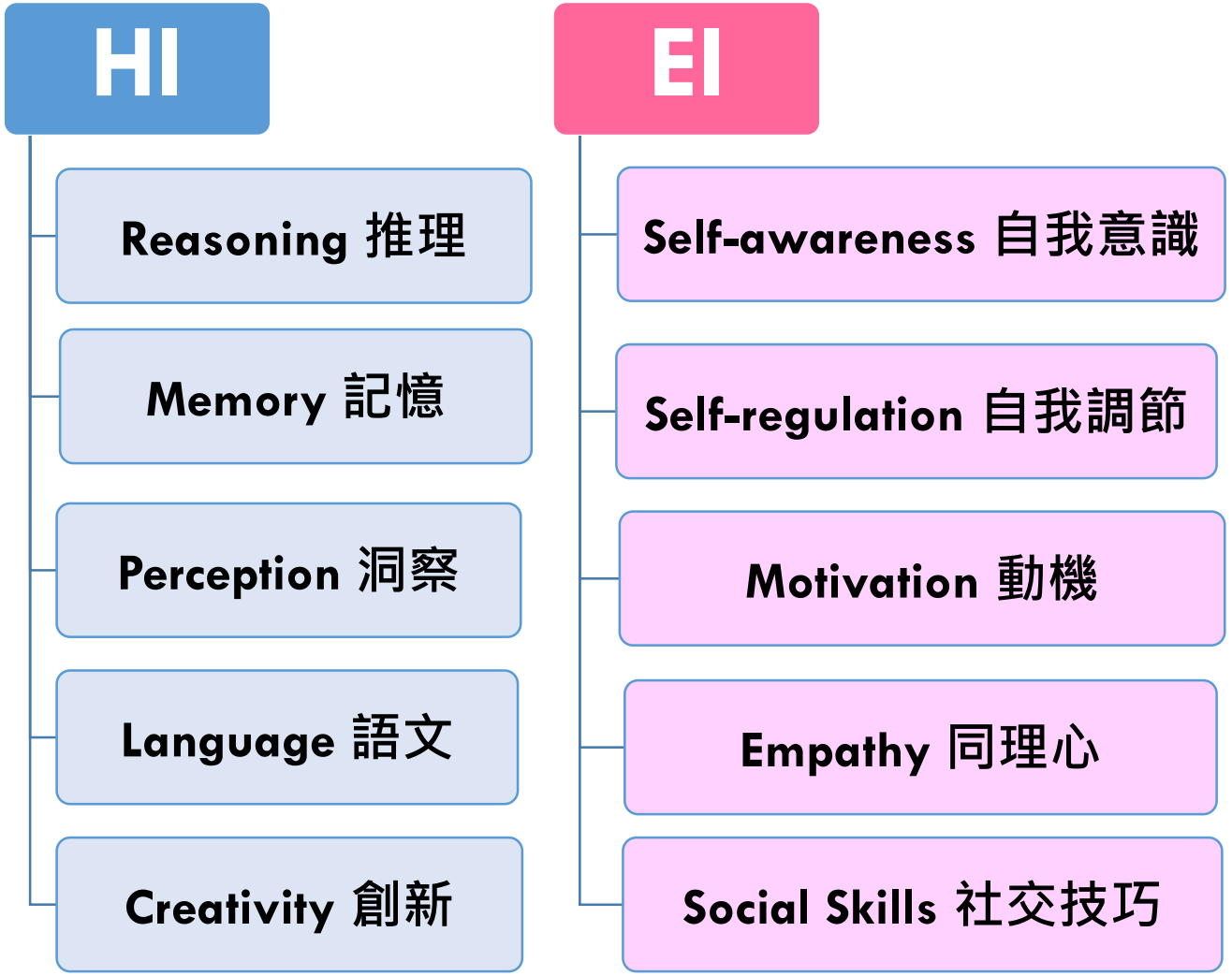
虛擬學習的挑戰



Human Intelligence (HI) & Emotion Intelligence (EI)

In the AI era, HI and EI become even more important. They complement AI by providing creativity, empathy, and ethical considerations that AI lacks. Human judgment is crucial for interpreting AI-generated insights, managing change, and building trust in technology.

EI is the least likely HI to be replaced by AI.



Learning of EI in the Virtual Environment

Emotional Intelligence Apps

- **Mood Meter:**
  - Developed by the Yale Center for Emotional Intelligence
- **Headspace:**
  - Headspace offers guided meditations and mindfulness exercises

Online Courses and Workshops

- **Coursera and LinkedIn Learning:**
  - offer courses on emotional intelligence
- **Mind Tools:**
  - Provides a range of resources and articles

Virtual Reality (VR) Simulations

- **Mursion:**
  - Offers VR simulations for practicing interpersonal skills
- **Ovation:**
  - A VR public speaking training tool

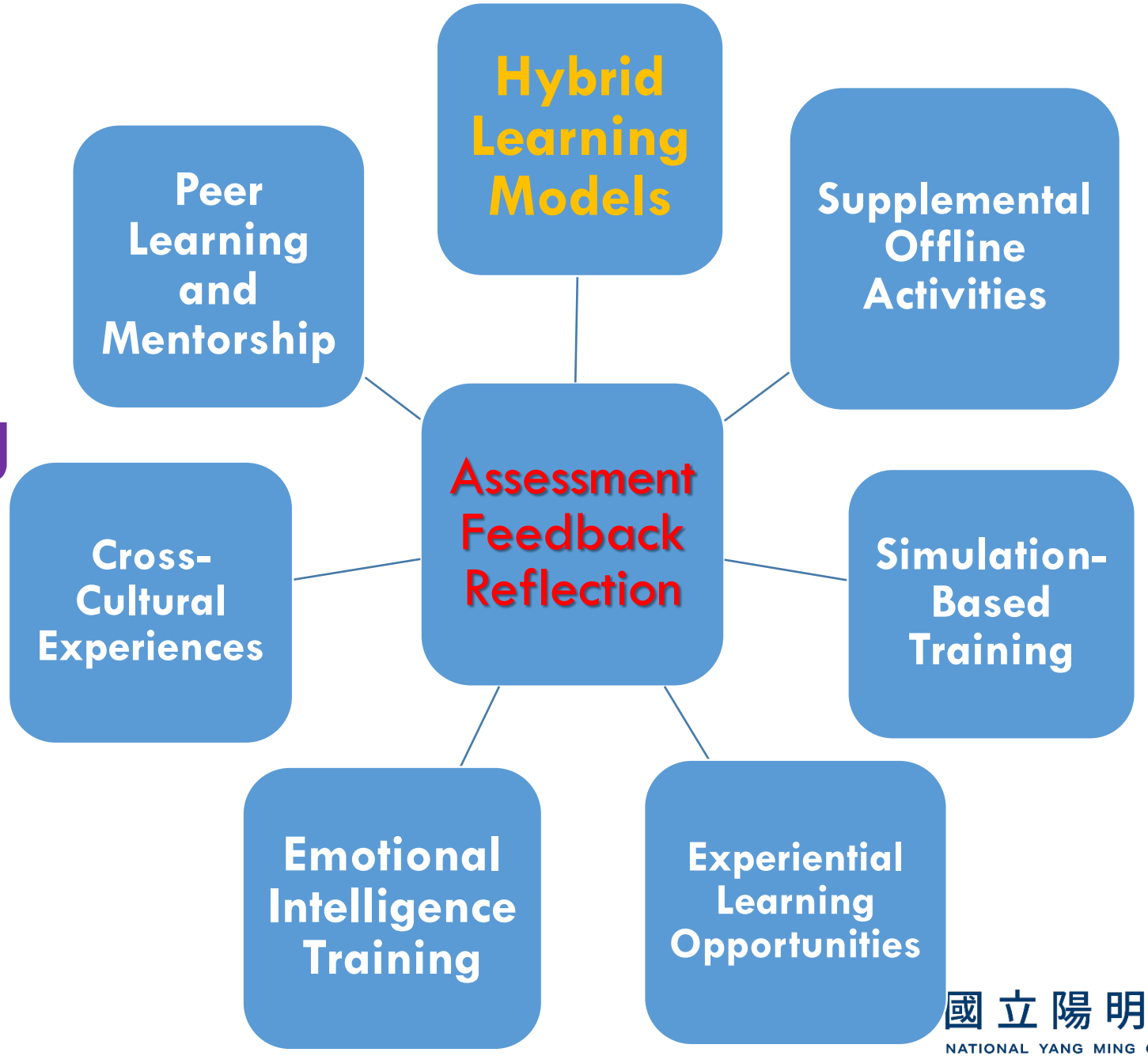
Online Therapy and Coaching Platforms

- **BetterHelp and Talkspace:**
  - Provide access to therapists and counselors
- **Coach.me:**
  - Offers coaching services focused on various personal development

Interactive Online Games and Activities

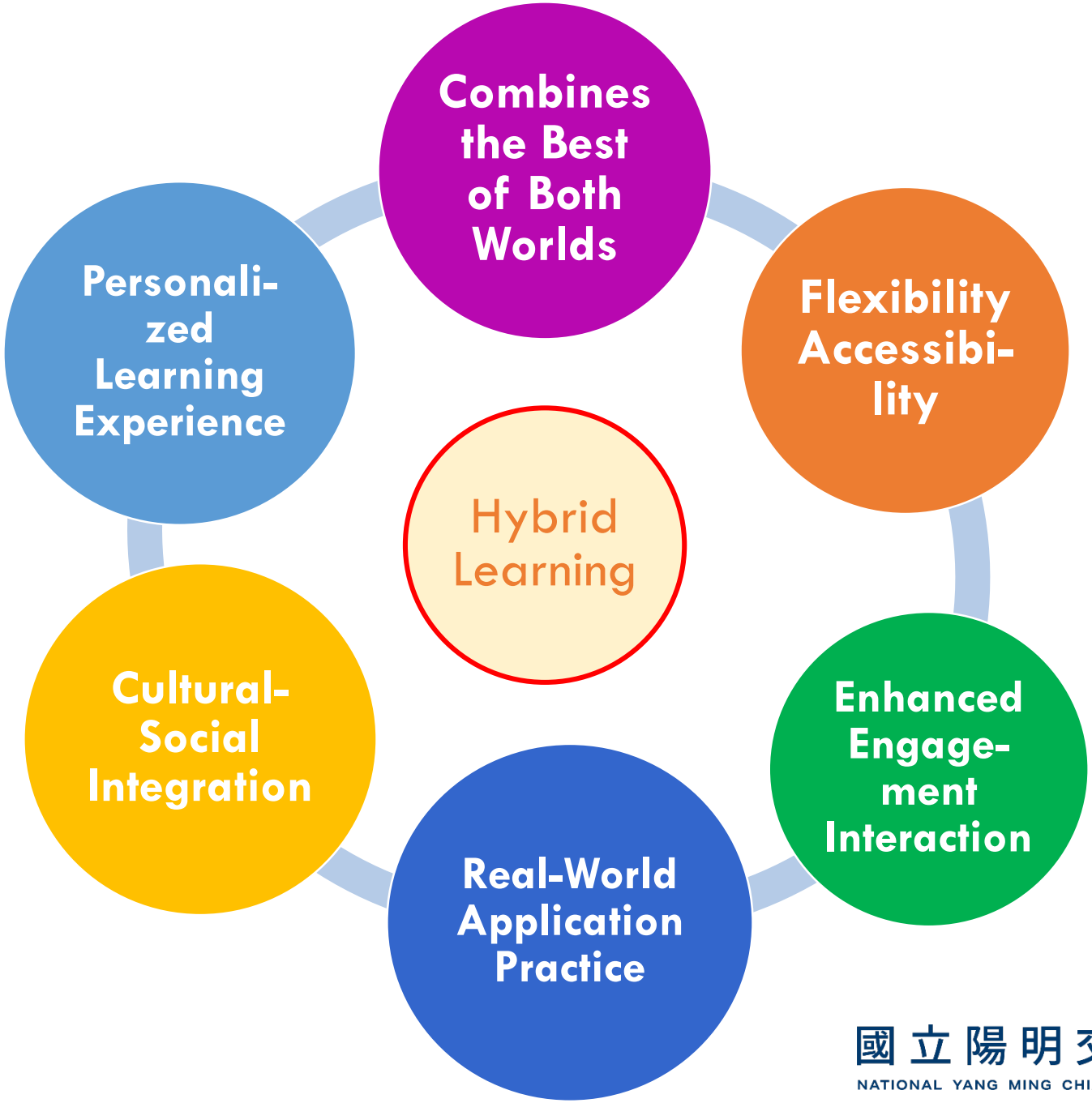
- **EQ-i 2.0:**
  - An online assessment tool that measures emotional intelligence
- **Role-playing games (RPGs):**
  - Provide scenarios where players must navigate social interactions

Methods to Address VR Learning Challenges



Advantages of a Hybrid Learning Model

Hybrid :
Combining both in-person and virtual experiences



Conclusions

Future World

CALVIN

(coined by Haydn Chen)

2024 new acronym for the world of future

Navigating effectively in the future world of

CALVIN

requires a diverse set of skills and approaches

Advices to Students and Teachers of All Disciplines

Navigate in the AI era

Overall Strategies for Soft Skills Development in the AI Era

Overall Strategies

綜合策略

- Emphasize Emotional/Human Intelligence (HI) 強化情緒/人類智能
- Utilize Virtual Reality (VR) and Simulations 善用虛擬模擬工具
- Adapt to Remote Work Dynamics 適應異地工作實況
- Personalize Learning Experiences 客製化個人學習歷程
- Integrate Soft Skills with Technical Training 融合軟實力的技能培訓
- Emphasize Continuous Learning 強調終身學習

Conclusion

Education is to cultivate both professional hard skills and broad-based soft skills.

The effects of AI and the Metaverse is complex and multifaceted

The mass of unknowns in the CALVIN future world will inevitably redefine the essence, content, and teaching methods of general and continuous education.

The future lifestyle and socio-cultural patterns will blend virtual and real elements into a hybrid learning environment.

The digital transformation of education enhances teaching and learning, yet hindering learning of soft skills.


Thank you
Education of the young minds
for the future lies in the hands
of the teachers of presence ....