

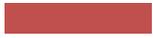
# AI in Education: Quagmire or Watershed



Ollscoil Chathair  
Bhaile Átha Cliath  
Dublin City University

OCCE conference – Feb. 2024

Prof. Deirdre Butler



***"Education is the  
most powerful  
weapon which you  
can use to change  
the world."***

*Nelson Mandela*

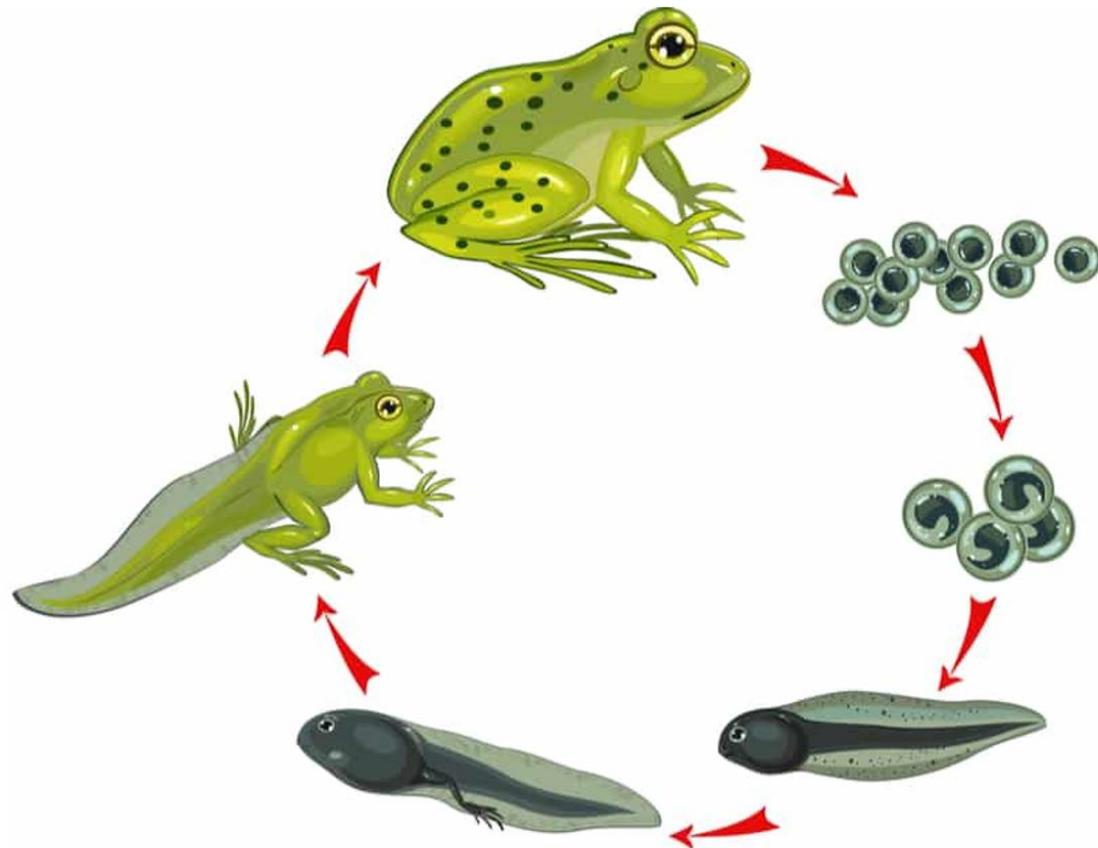
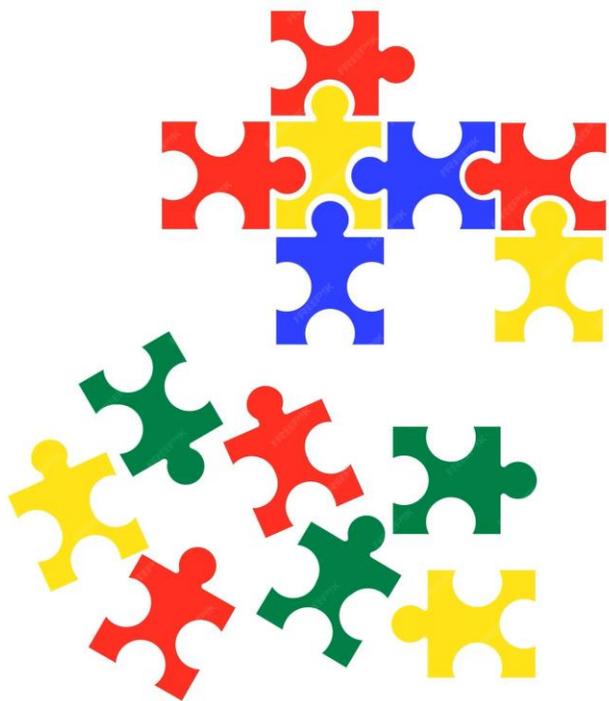
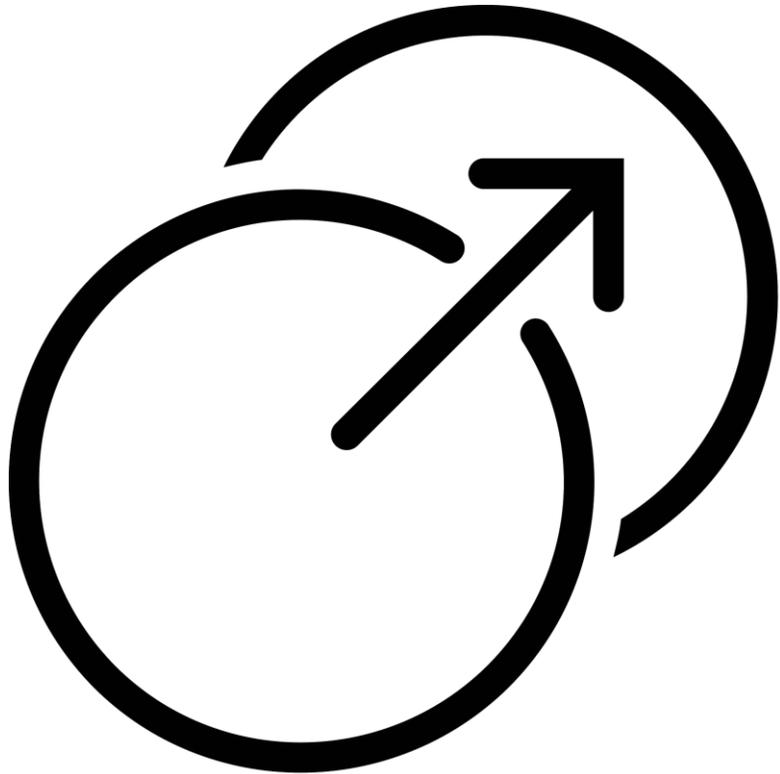
---

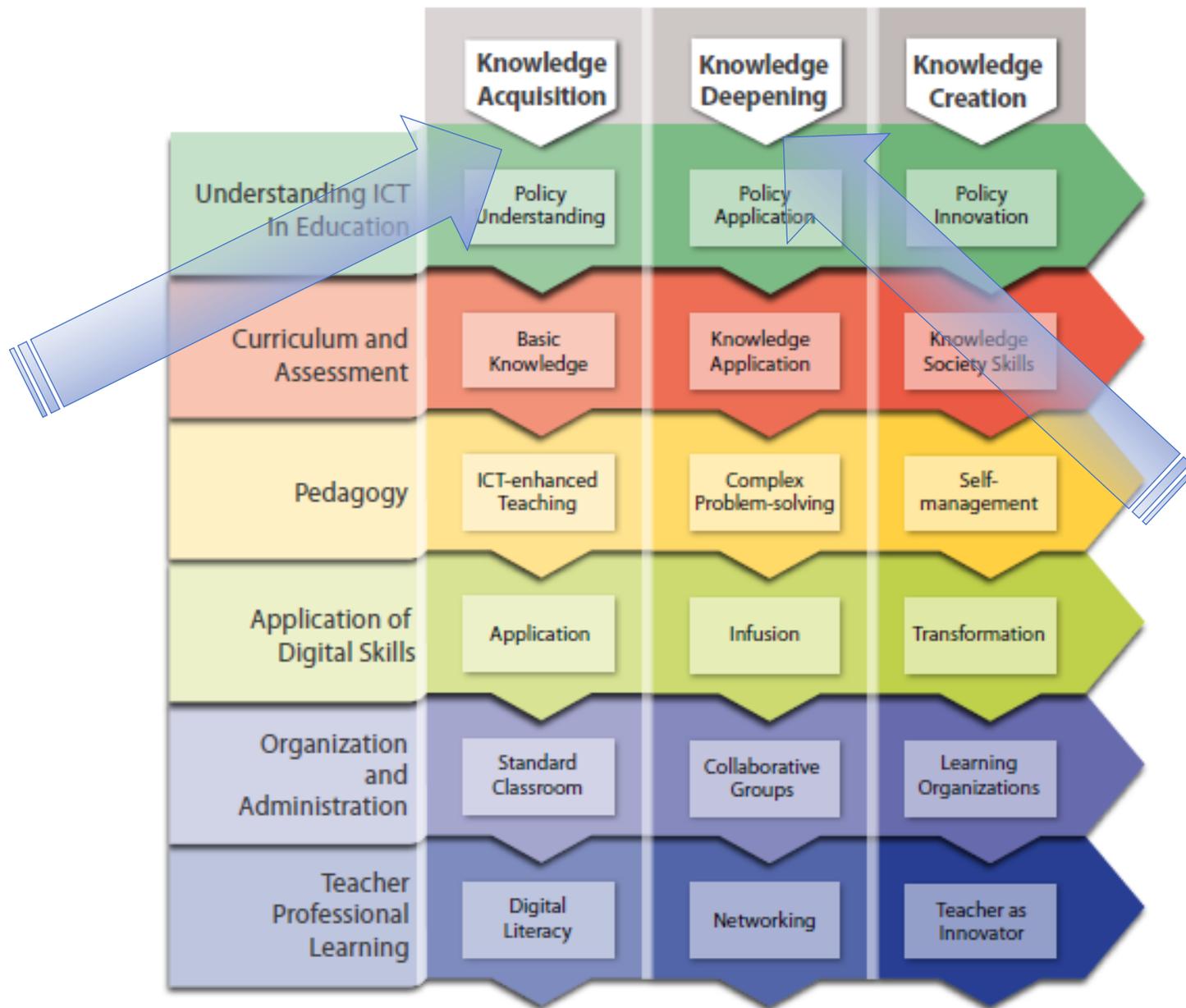
# How much has school changed?

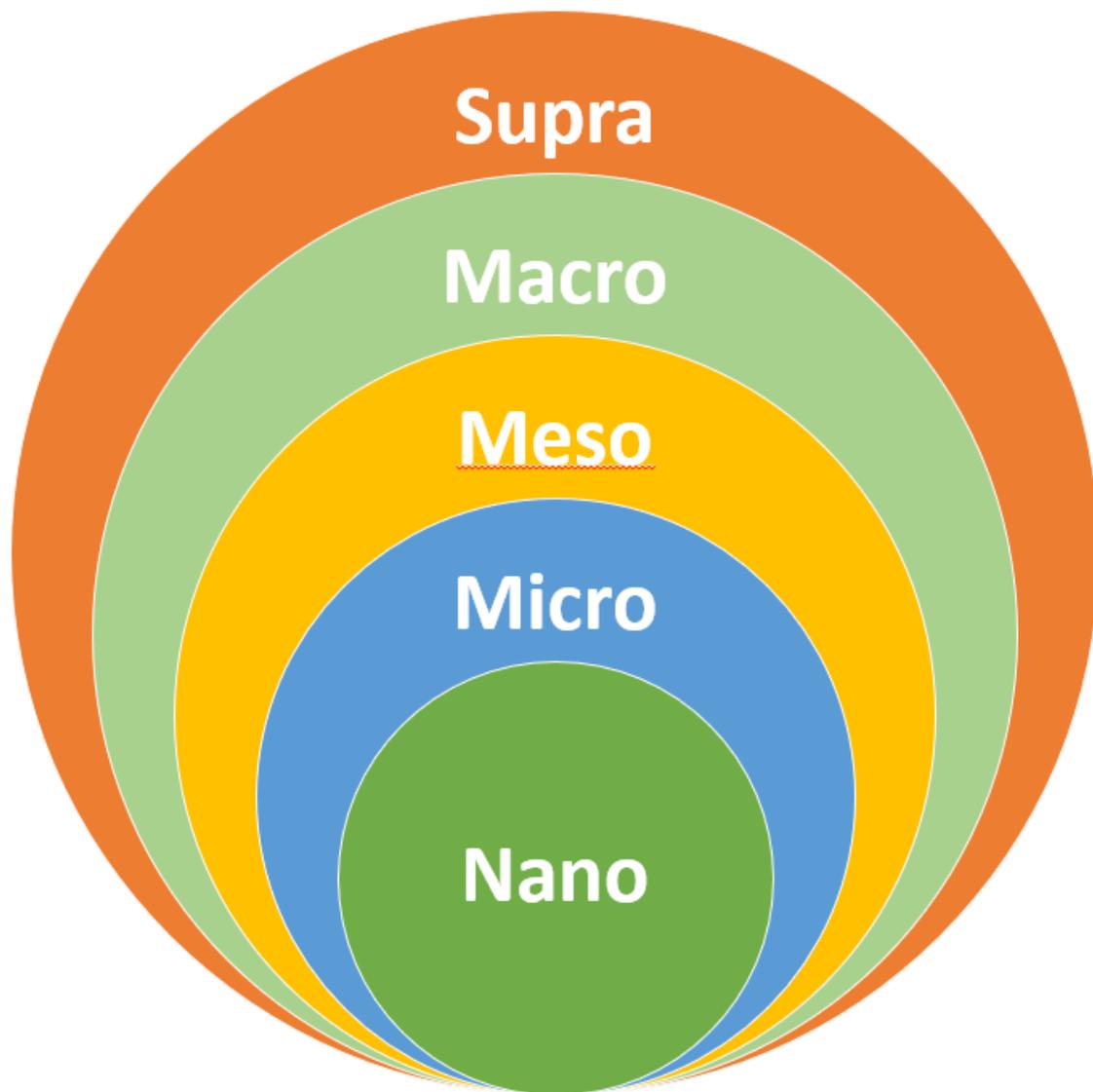
---

- Why should I go to school?
- How will it support my learning?
- How will it prepare me for life









Site of activity	Examples of activity	Examples of actors
Supra	Transnational curricular discourse generation, policy borrowing and lending; policy learning	OECD; World Bank; UNESCO; EU
Macro	Development of curriculum policy frameworks; legislation to establish agencies and infrastructure	National governments, curriculum agencies
Meso	Production of guidance; leadership of and support for curriculum making; production of resources	National governments; curriculum agencies; district authorities; textbook publishers; curriculum brokers; subject-area counsellors
Micro	School level curriculum making: programme design; lesson-planning	Principals; senior leaders; middle leaders; teachers
Nano	Curriculum making in classrooms and other learning spaces: pedagogic interactions; curriculum events	Teachers; students

Table 2: Sites of curriculum making

Priestley, M., Philippou, S., Alvunger, D. & Soini, T. (2021). Curriculum Making: A conceptual framing. In: M. Priestley, D. Alvunger, S. Philippou. & T. Soini, *Curriculum making in Europe: policy and practice within and across diverse contexts*. Bingley: Emerald.

2022



**ChatGPT**

Three AI-generated cards are displayed in a carousel. The first card on the left features a retro-style poster with a guitar and a yin-yang symbol, surrounded by leaves. The middle card shows a table with various types of trees, organized by habitat. The third card on the right contains a Python script for a binary search algorithm.

Create a poster for an outdoor music festival, retro style, no text

Organize the world's tallest trees into a table by habitat

Write a Python script to perform Binary search

Copilot uses AI. Check for mistakes. [Terms](#) | [Privacy](#) | [FAQs](#)

Choose a conversation style

More Creative **More Balanced** More Precise



Ask me anything...



0/2000





## PL-AI

f Share

🐦 Tweet

✉ Email

Civic Theatre introduces PL-AI, the experimental stage-show where an artificial intelligence-generated script for an original play is instantly created from audience prompts, and staged 'impromptu' by Actors. The show is FREE but ticketed, on a strictly limited basis.

PL-AI puts the audience in control of the creative process. Through a moderator, the audience suggests a plays genre, key plot points, and other details, which are then fed into an AI system. The computer immediately generates a script on the spot, which is then performed impromptu by highly skilled actors.

The show in turn offers the audience a deeper understanding of story-arcs and the traditional process of play development. To participate in the show, the audience will be moderated by a host who will invite them to suggest a plays genre, key plot points, and other details. These suggestions will be fed into ChatGPT, which will analyse and generate a script in real-time. The actors will then perform the play live, using their skills and instincts to bring the script to life on stage.



### EVENT DETAILS

#### DATE & TIME:

9 March // 7pm

#### LOCATION:

Main Space

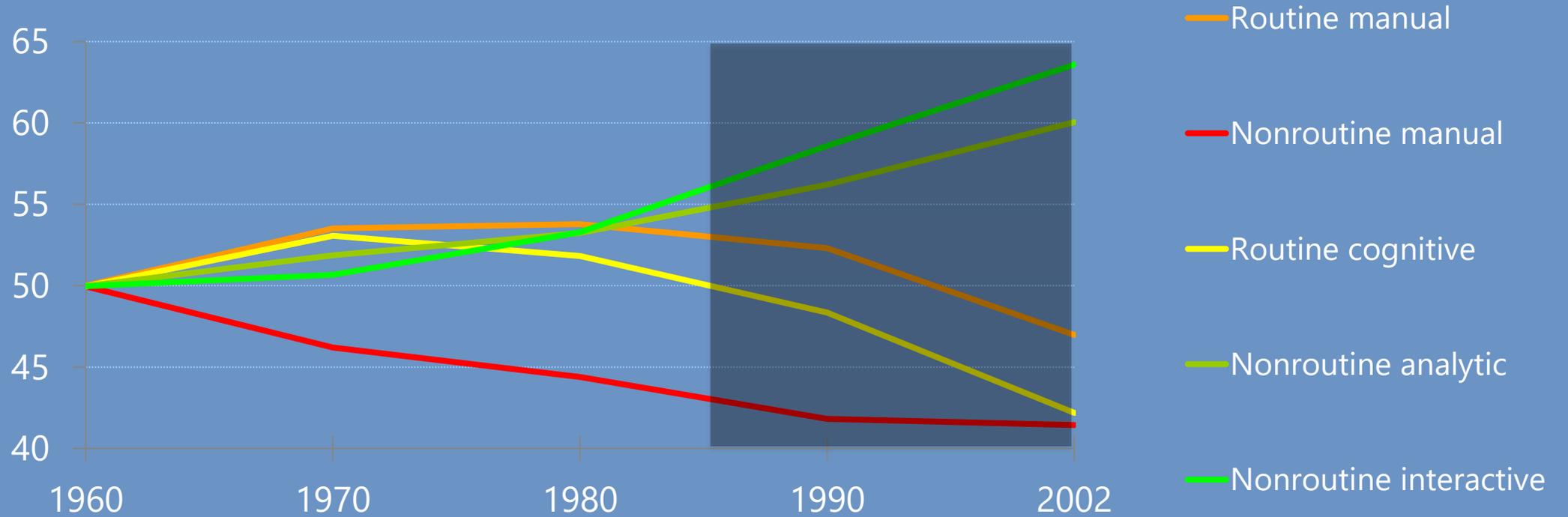
#### TICKETS:

Free Ticketed Event, Booking Required

[BOOK NOW](#)

# How the demand for skills has changed

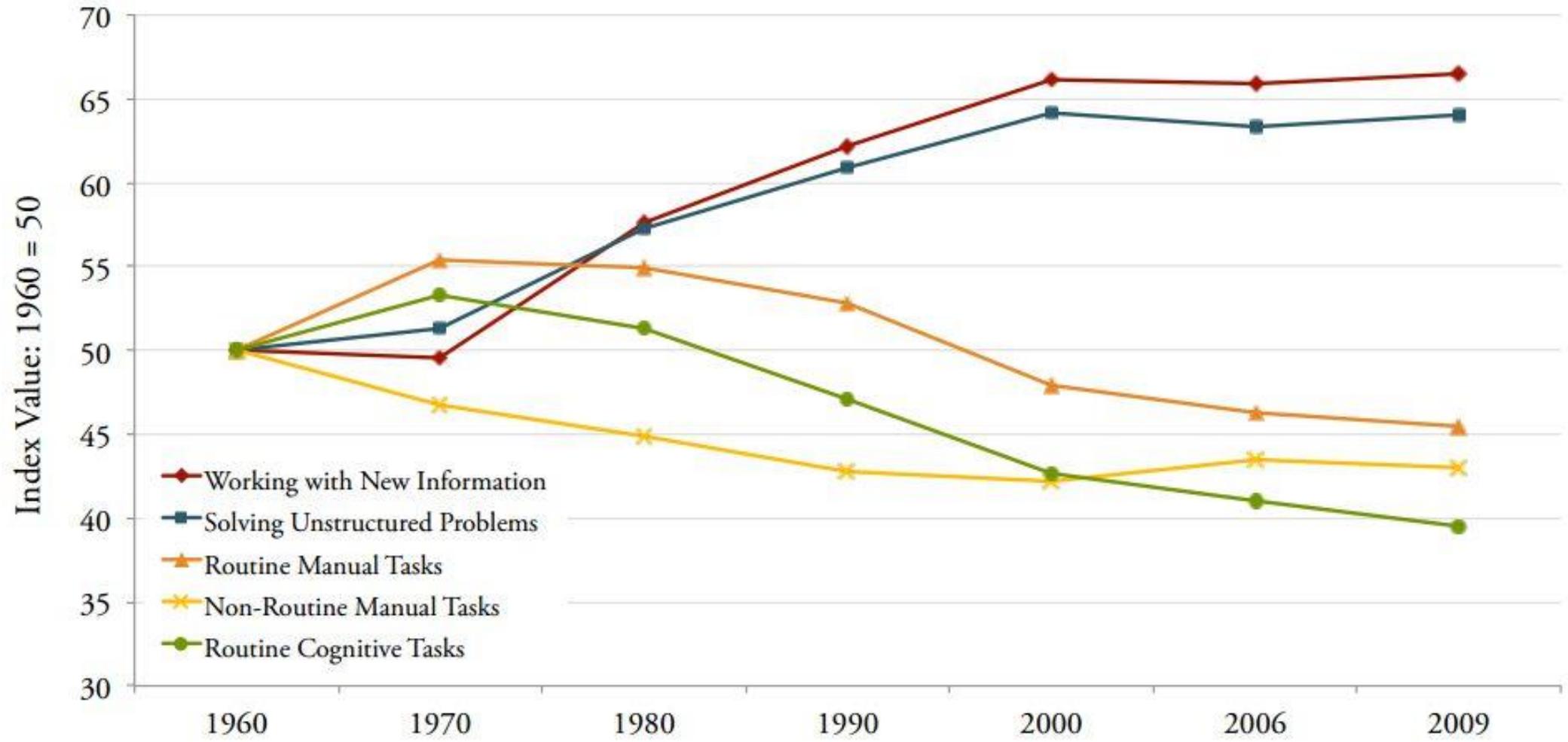
Economy-wide measures of routine and non-routine task input (US)



(Levy and Murnane)

**Critical Thinking**  
**Complex Communication**

Figure 3: Index of Changing Work Tasks in the U.S. Economy 1960-2009<sup>21</sup>



# Top 10 skills

## in 2025

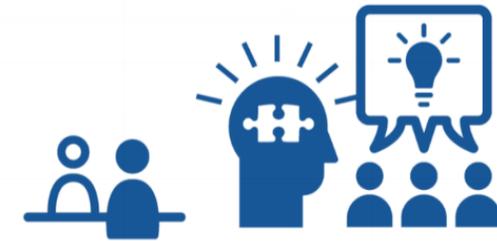
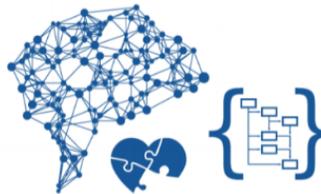
1. Analytical thinking and innovation
2. Active learning and learning strategies
3. Complex problem-solving
4. Critical thinking and analysis
5. Creativity, originality and initiative
6. Leadership and social influence
7. Technology use, monitoring and control
8. Technology design and programming
9. Resilience, stress tolerance and flexibility
10. Reasoning, problem-solving and ideation

## in 2020

1. Complex Problem Solving
2. Critical Thinking
3. Creativity
4. People Management
5. Coordinating with Others
6. Emotional Intelligence
7. Judgment and Decision Making
8. Service Orientation
9. Negotiation
10. Cognitive Flexibility

## in 2015

1. Complex Problem Solving
2. Coordinating with Others
3. People Management
4. Critical Thinking
5. Negotiation
6. Quality Control
7. Service Orientation
8. Judgment and Decision Making
9. Active Listening
10. Creativity





## Artificial Intelligence

Home > Artificial Intelligence



Artificial Intelligence (AI) refers to machine-based systems that can make predictions, recommendations, or decisions influencing real or virtual environments.

AI and Machine Learning are all around us, transforming the way we live and do business. AI holds the key to solving key societal challenges – be it in the area of climate change, or disease treatment. According to some estimates, the uptake of AI methods could add approximately [€2.5 trillion to European GDP by 2030](#). The European Commission's latest 2022 [AI Watch Index](#) indicates that the EU investment in AI grew by 39% between 2018 and 2019, positioning the EU to exceed the target of €20 billion into AI during this decade. The emergence of AI systems has created a high demand for skilled specialists, which leads to a need for reskilling and upskilling. With AI embedded in virtually all sectors of EU economy, demand for AI skills has exploded – a trend projected to increase further. Specialist AI skills are not only needed in the ICT field, but increasingly in all other sectors and domains. This technology is also changing the nature of our jobs and role of humans in the economy.

Europe has taken a number of steps to enhance AI's uptake, development and deployment: from the [European AI Alliance](#), the [European High-Level Group for Artificial Intelligence](#), [AI Watch](#), to many upskilling courses and educational programmes. The [European AI Strategy](#) announced in 2021 will ensure that future AI systems are ethical and legal, reflecting core European values. Also, the [AI Act](#) proposed by the EU in 2021 classifies the specific uses of AI, introducing harmonised rules.

The [Digital Europe Programme \(DIGITAL\)](#) is investing in learning and training opportunities that will create new AI experts.

The Digital Skills and Jobs Platform provides an overview of AI-related information: EU and national initiatives, resources, trainings, funding and career opportunities. Browse through the page to see more!

The Platform also offers [basic](#) and advanced learning paths with several trainings and resources, as well as other learning content.

Also, don't miss the opportunity to explore your interest in AI in exchanges with your peers and digital experts across Europe by joining our [Community](#).



# Strategic Intelligence

Strategic insights and contextual intelligence  
from the World Economic Forum

Explore and monitor the issues and forces driving transformational change across  
economies, industries, and global issues



Watch Video

## Highlights

COVID-19



New

Green New  
Deals



New

Vaccination

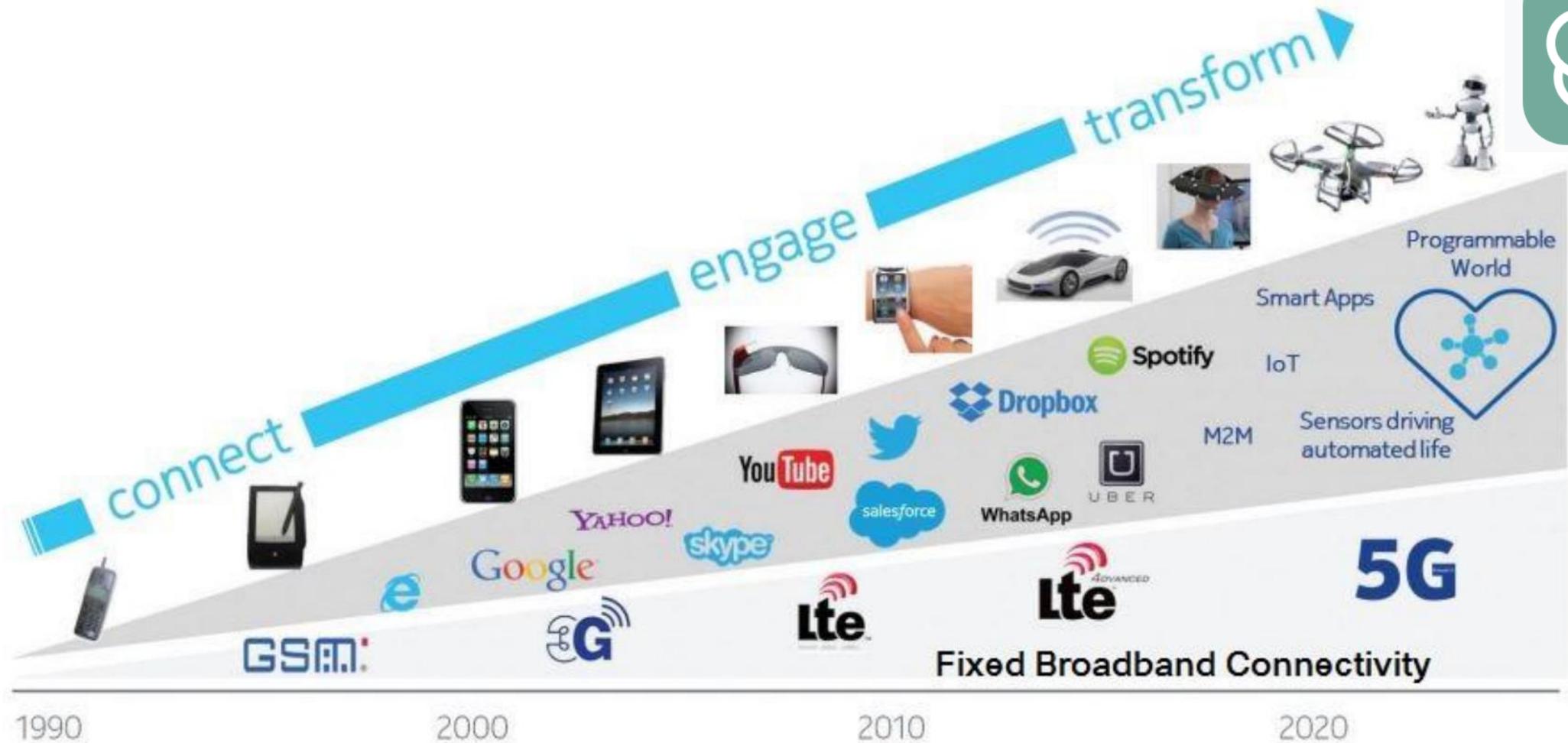


Values

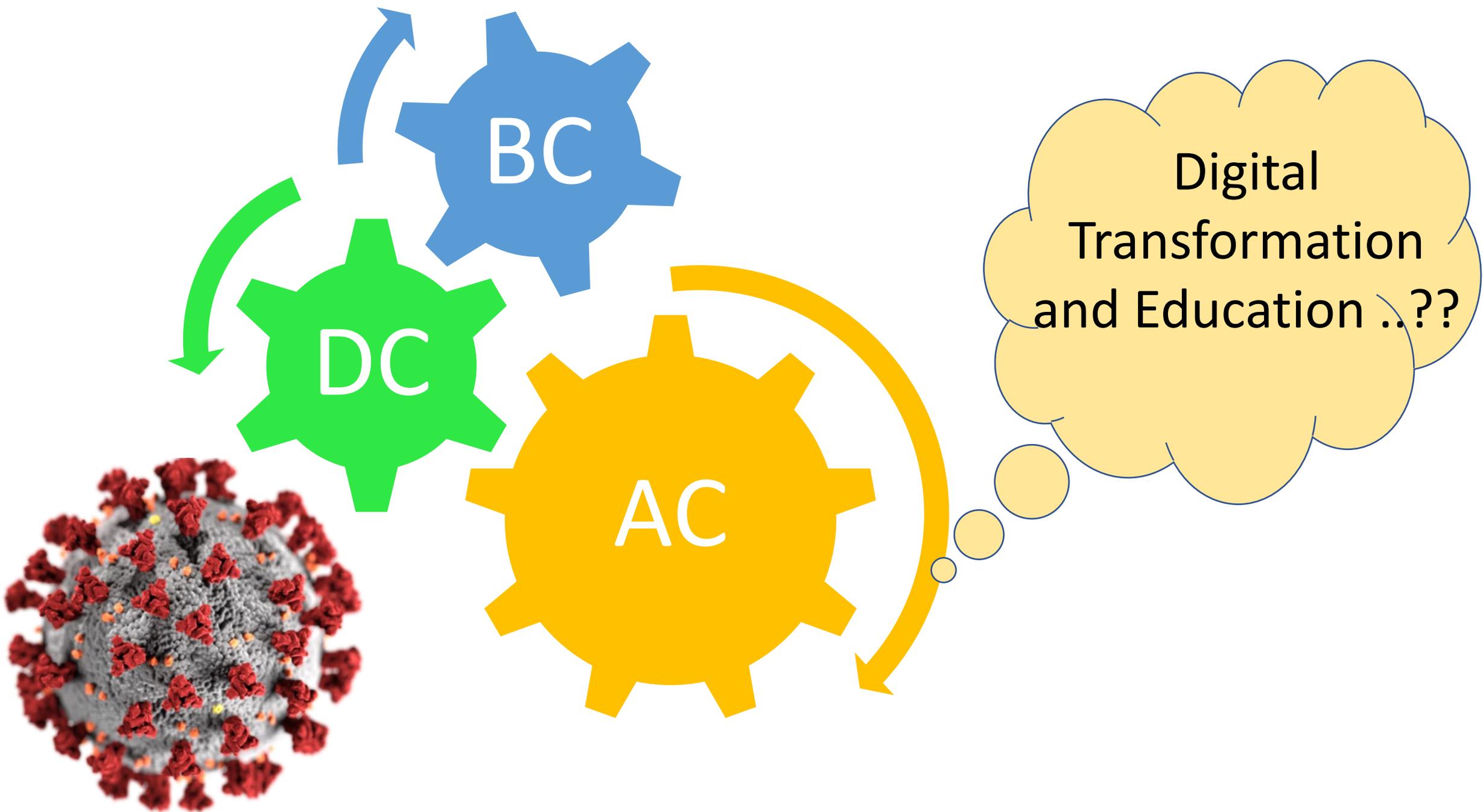




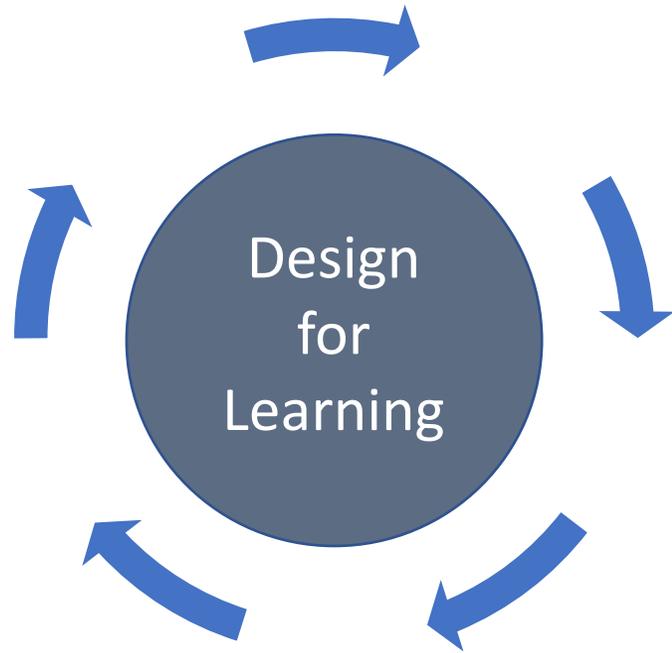
# The world is changing



Based on Nokia Networks Technology Vision white paper 2020



Digital  
Transformation  
and Education ..??



**Phase 1 Disruption**  
Shifting to Remote Learning

Navigate the Zones of Disruption:  
Unsettled - Learning - Growth

**Phase 2 Transition**  
to Reopening Schools

Manage the structures, processes and decisions needed to reopen schools.

**Phase 3 Reimagining**  
Learning

Create an agile, innovative and future focused hybrid deep learning system.

Remote to Hybrid Learning

A POSITION PAPER ON A PARADIGM SHIFT FOR EDUCATION

# Education Reimagined:

The Future of Learning



In support of  
COVID-19  
Global Education Coalition  
Launched by UNESCO



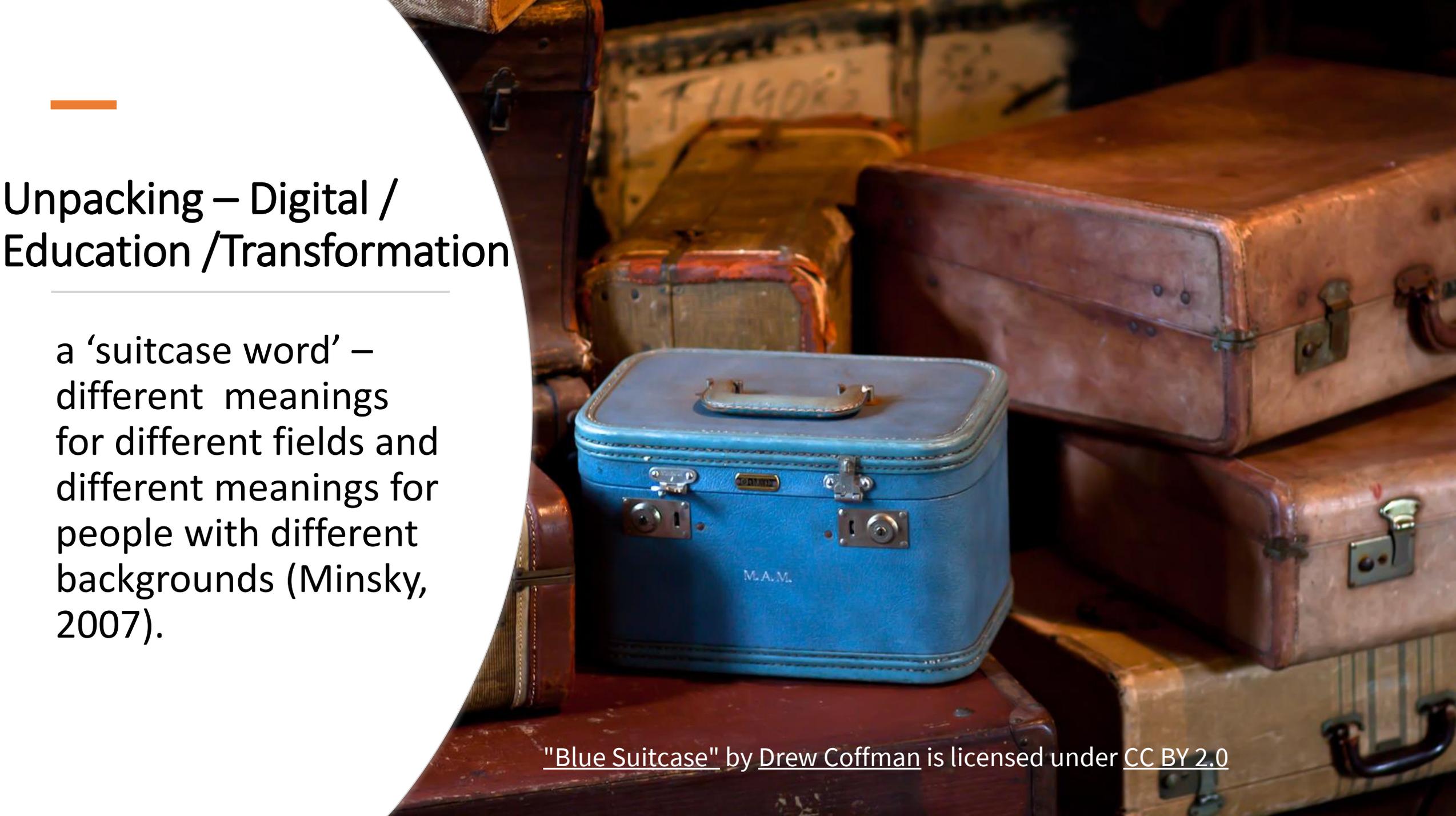
New Pedagogies for  
**Deep Learning™**  
A GLOBAL PARTNERSHIP

What do we mean by  
Artificial Intelligence?

What do we mean by  
transformation?

What does the use of AI  
in / for Education mean ?





—

## Unpacking – Digital / Education /Transformation

---

a ‘suitcase word’ –  
different meanings  
for different fields and  
different meanings for  
people with different  
backgrounds (Minsky,  
2007).

"Blue Suitcase" by Drew Coffman is licensed under CC BY 2.0



# AI & Education

- Learning Spaces
- Learning Design
- Pedagogical Approaches
- Assessment
- Formal / Informal / Non-formal
- Lifelong
- Actors / Stakeholders



## Students, Computers and Learning

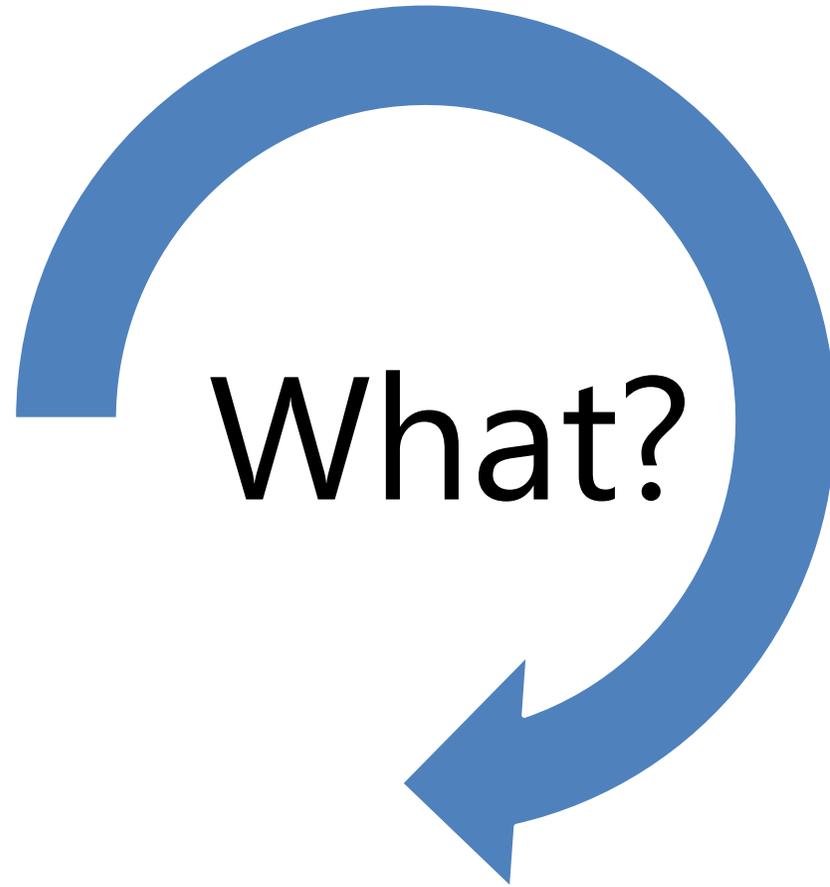
MAKING THE CONNECTION



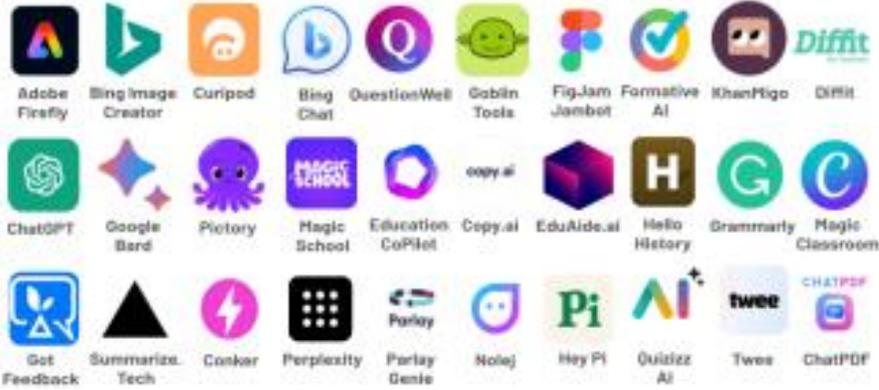
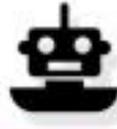
Programme for International Student Assessment



Students unable to navigate through a complex digital landscape will no longer be able to participate fully in the economic, cultural and social life around them.



# 30 AI tools to use in the classroom



## CHATGPT & GENERATIVE AI

### 7 AI Tools That Help Teachers Work More Efficiently

These apps and websites can help teachers boost their productivity, personalize learning, and create lesson content.

By [Rachelle Dené Poth](#)

October 20, 2023



BEST OF

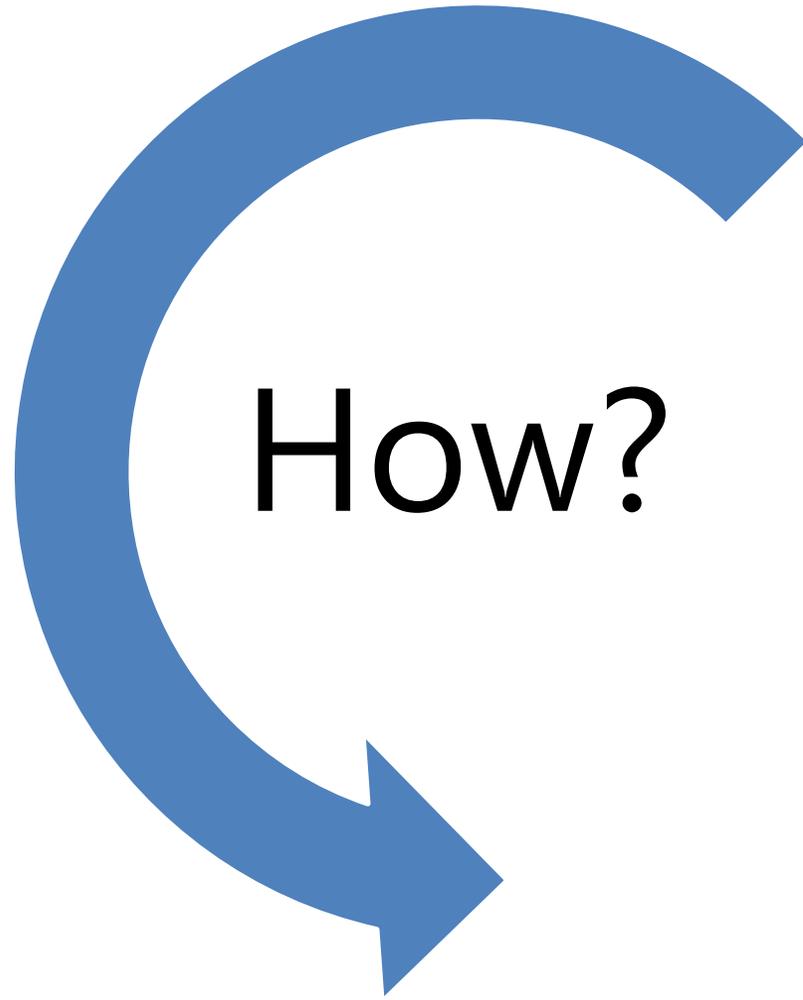
# 10 Best AI Tools for Education (February 2024)



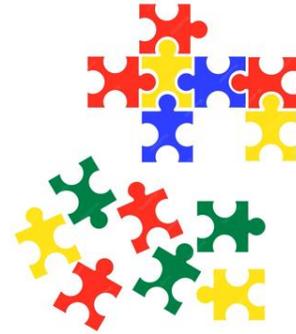
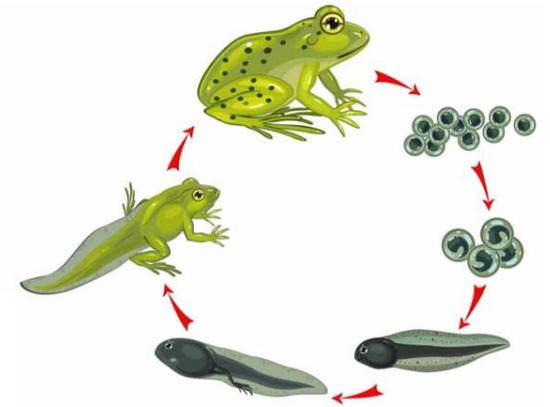
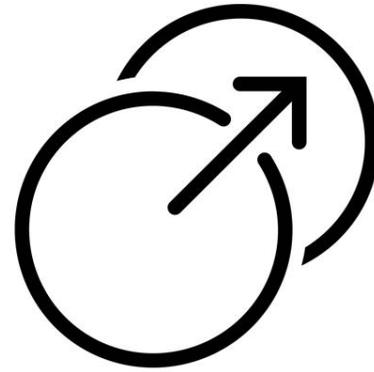
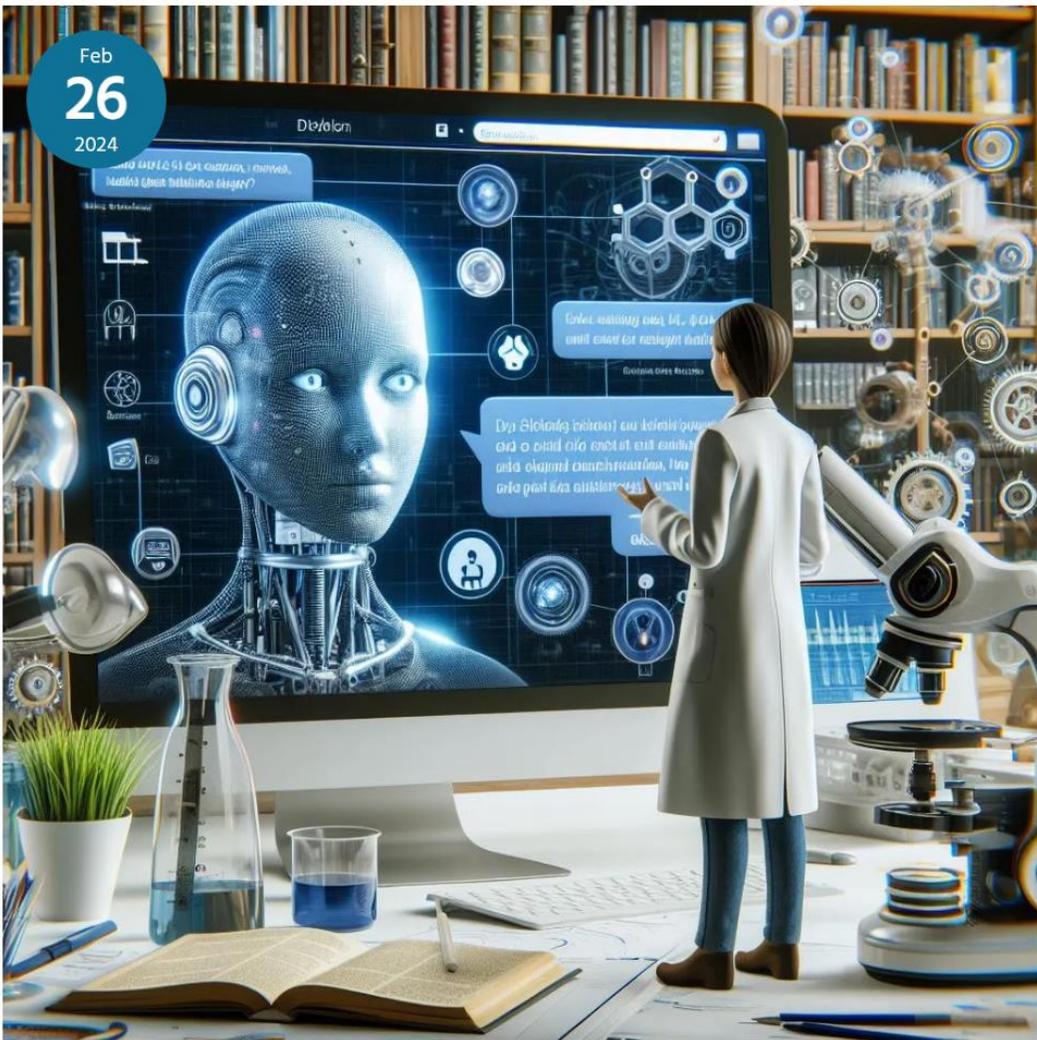
Updated on February 22, 2024

By Alex McFarland





How?



## AI & Additional Assessment Components in the Senior Sciences

By Humphrey Jones

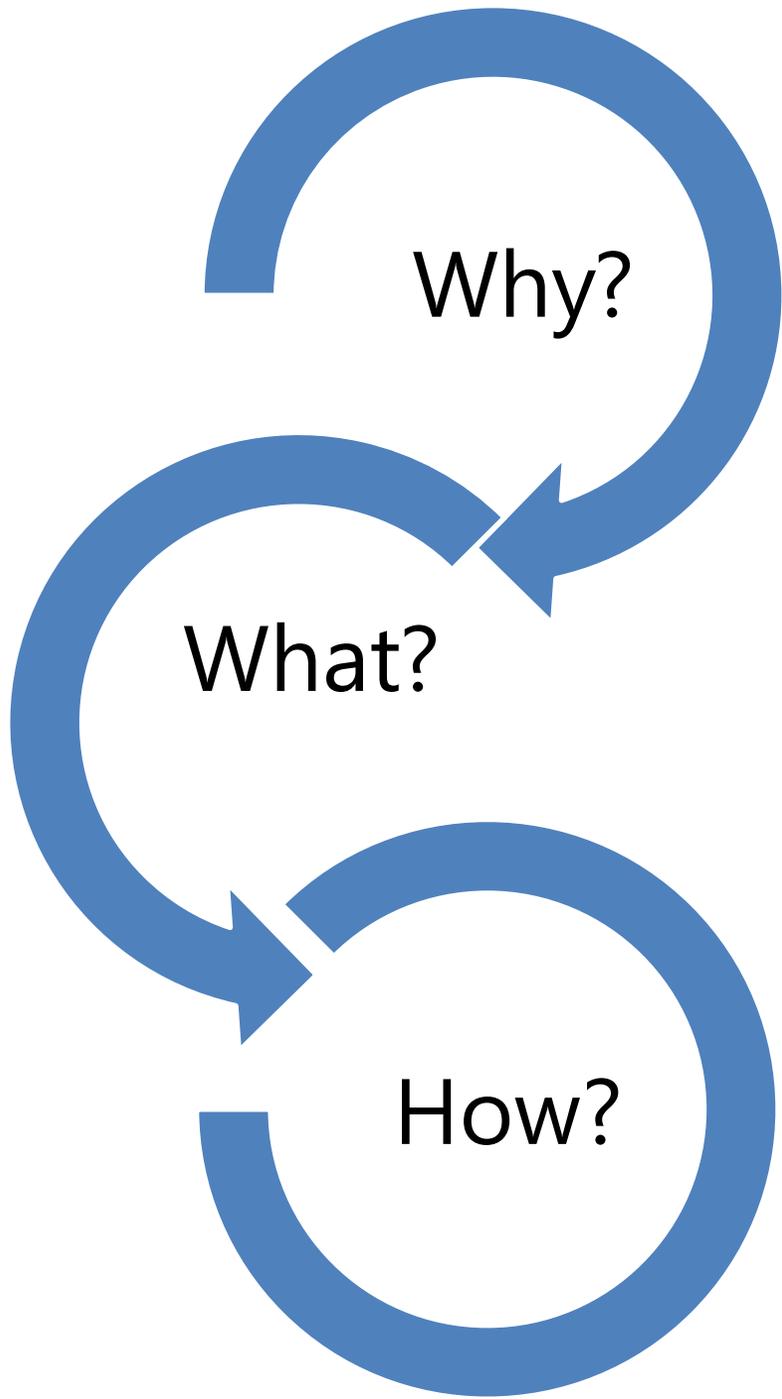
teach **net**.ie





Constant change.....!!!!

---



Why?

What?

How?



## AI and Public Trust

“Scientists and non-scientists alike have been shocked by the speed at which AI is impacting all aspects of society. To avoid poor outcomes, scientists must work with policymakers and the public to shape an AI future that benefits all.”

Marcia McNutt, president, National Academy of Sciences

## Shaping the Future of AI

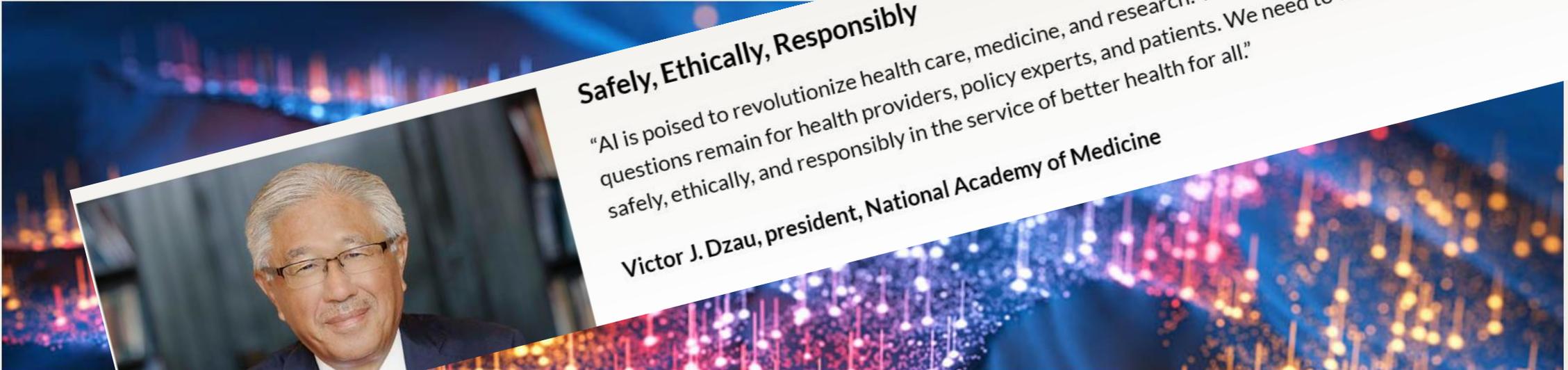
SHARE [f](#) [t](#) [in](#) [✉](#)

*Artificial intelligence and related technologies – such as machine learning, large language models, and neural networks – are advancing at a rapid pace. As AI is used increasingly in daily life and work, the National Academies are advising the nation on AI use, policy, ethics, and development.*

## Safely, Ethically, Responsibly

“AI is poised to revolutionize health care, medicine, and research. This is an exciting moment, but many questions remain for health providers, policy experts, and patients. We need to ensure these tools are used safely, ethically, and responsibly in the service of better health for all.”

Victor J. Dzau, president, National Academy of Medicine



# Just How Intelligent Is Artificial Intelligence?

**Feature Story** | February 20, 2024

Computer scientist and award-winning author Melanie Mitchell has thought a lot about artificial intelligence — how it works in its many forms, how “intelligent” AI really is, how it might impact science and society at large, and what an AI-shaped future may bring. During a recent lecture that she delivered as part of the National Academy of Sciences’ [Distinctive Voices](#) program, Mitchell — a professor at the Santa Fe Institute — explored the tumultuous past, confusing present, and uncertain future of AI.

Read some excerpts:

“There are many different kinds of technologies that use what’s called artificial intelligence, ranging from chess-playing machines to self-driving cars to chatbots and so on. But artificial intelligence is also a scientific study of intelligence — more generally understanding the nature of “intelligence” in humans and machines, and for me, really understanding what it is to be human. What it is about our own intelligence that perhaps cannot be easily captured in machines.”

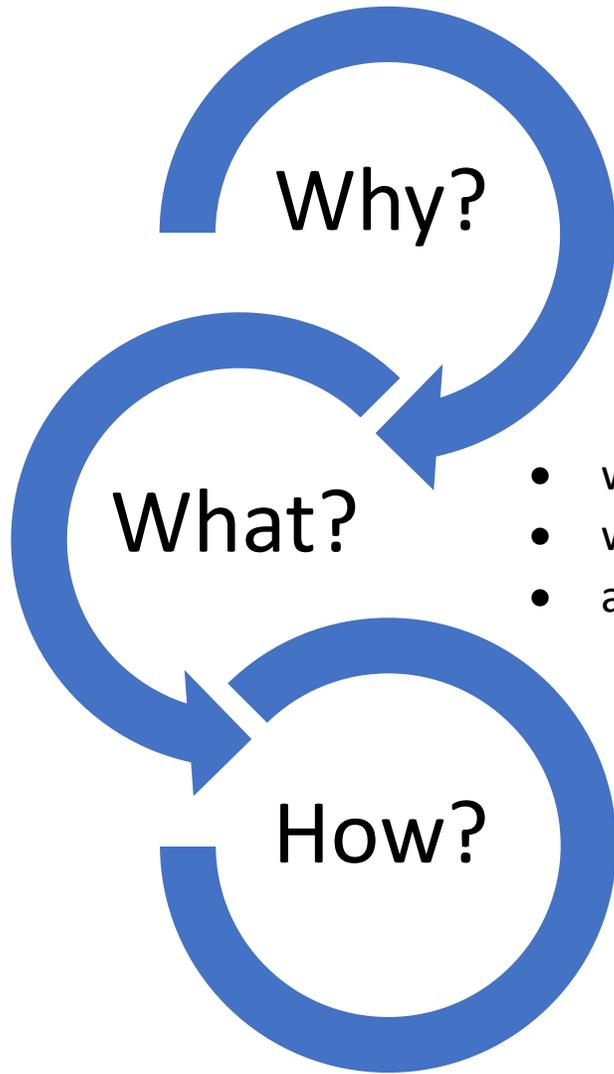
“These systems don’t learn like we do. They learn based on statistics of the data they have, and if there’s some cue in the data that will give them the right answer, they don’t care if it really has anything to do with the thing they’re supposed to be learning.”



Melanie Mitchell (SFI photo by Gabriella Marks)

“My biggest questions on the future of AI: One — In order to be more useful, trustworthy, transparent, and safe, how can AI learn to better understand our world, our values, our intentions, etc. And two — Can we develop the scientific tools to understand AI?”

“The future is not inevitable, but ours to create! I’ll end by quoting from an AI researcher from Canada, Sasha Luccioni, who said in a talk, ‘AI is not a done deal. We’re building the road as we walk it, and we can collectively decide what direction we want to go in, together.’ I think those are really wise words, and I hope that we can build an AI that really is good for humans, and not necessarily for machines themselves.”



- what kind of future do we want to create,
- what kind of people do we want to nurture
- and what values do we want to live by?

## Generative AI and the future of education



by Stefania Giannini,  
UNESCO Assistant Director-  
General for Education



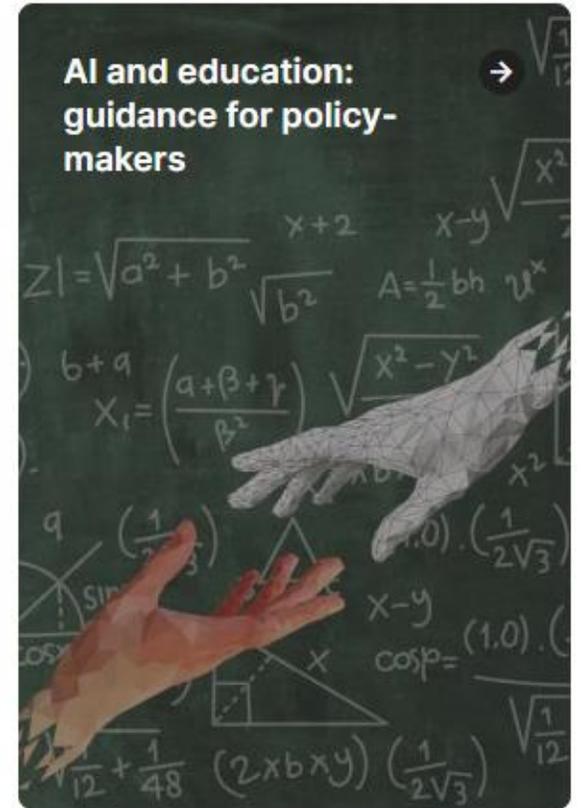
## Artificial intelligence and the Futures of Learning



## K-12 AI curricula: a mapping of government-endorsed AI curricula

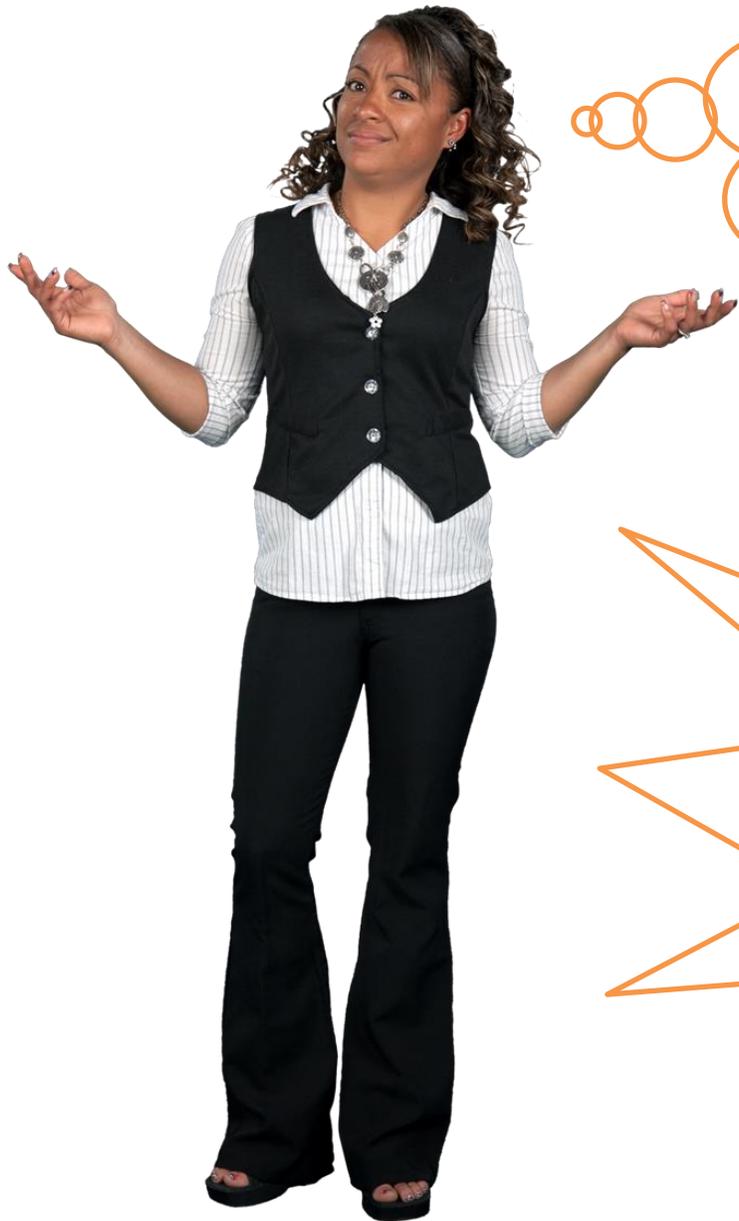


## AI and education: guidance for policy-makers



# unesco

United Nations  
Educational, Scientific  
and Cultural Organization

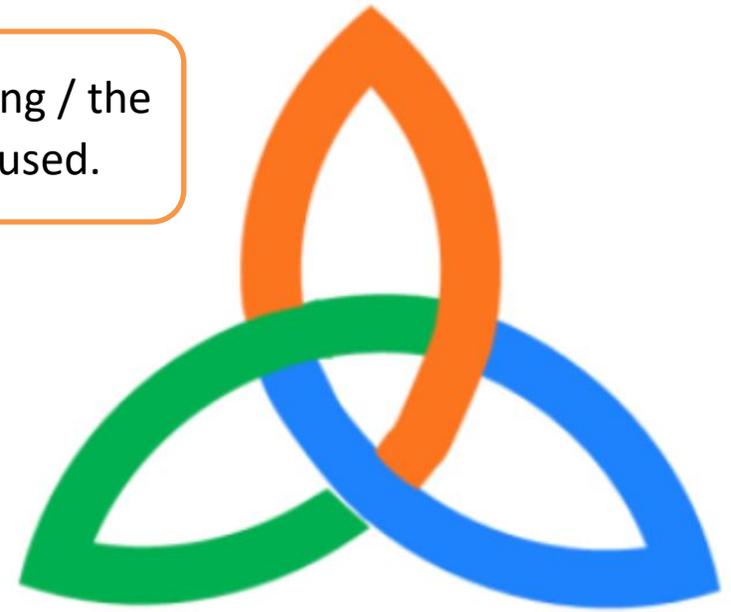


'these digital technologies are just another "tool" and won't fundamentally change what we do'.

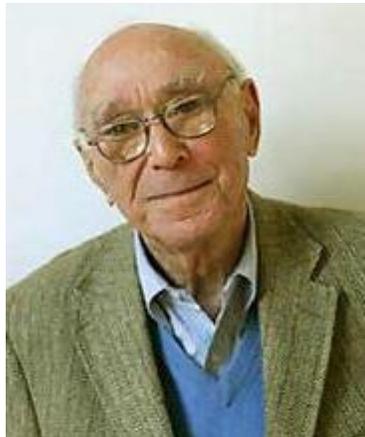


Digital technologies do not have an independent existence and cannot be considered separately from the values that people bestow on them

Consistency- explicit or implicit, between how people understand knowing / the nature of knowing, and what technologies are valued and how they are used.



thinking as the  
'internalisation of "tools"  
provided by a given culture'

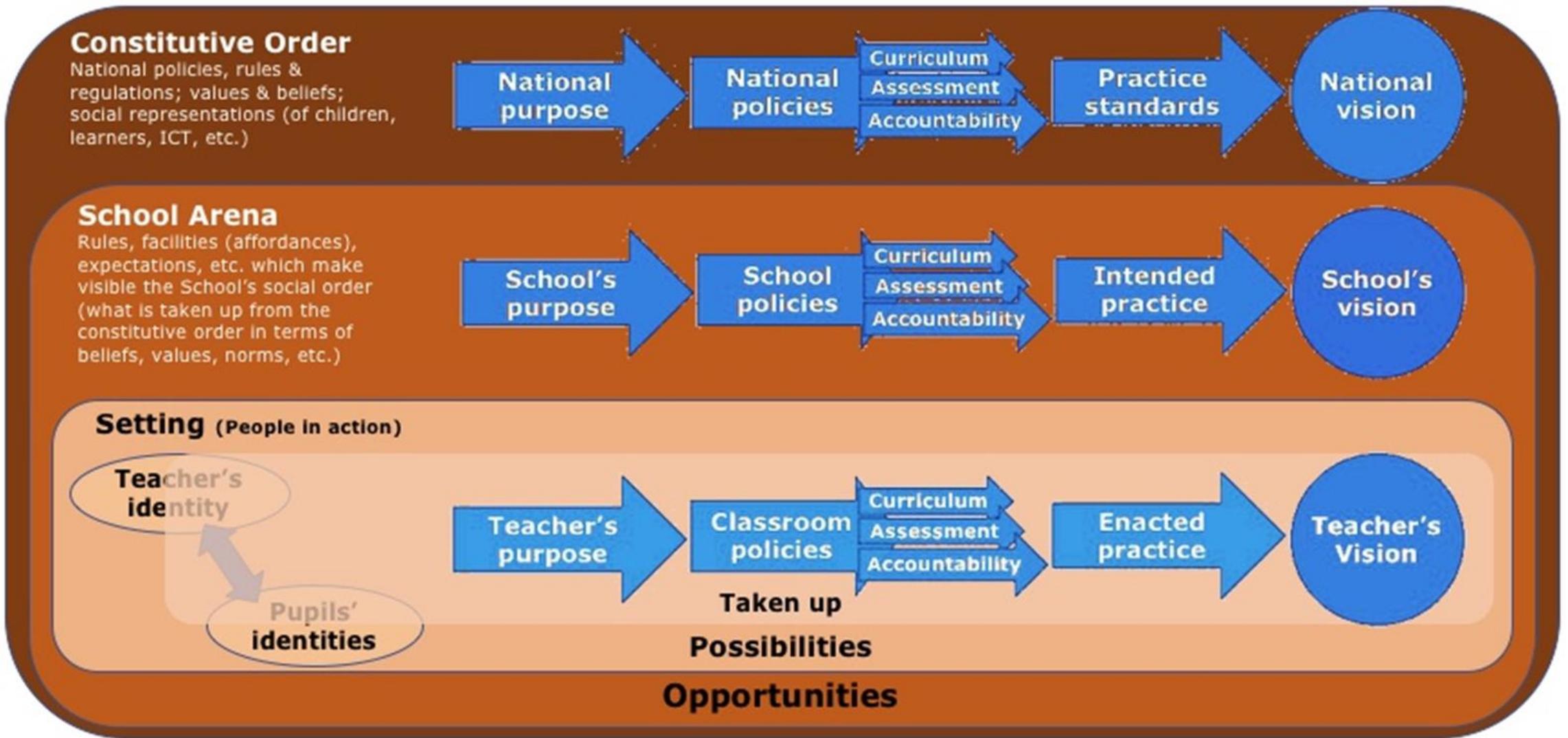


Jerome Bruner



Lev Vygotsky

... changes in tools bring  
about changes in thinking,  
and that these changes in  
turn are associated with  
changes in culture.



Butler, D.; Leahy, M.; Twining, P.; Akoh, B.; Chtouki, Y.; Farshadnia, S.; Moore, K.; Nikolov, R.; Pascual, C.; Sherman, B.; Valtonen, T. (2018) 'Education Systems in the Digital Age: The Need for Alignment'. *Technology, Knowledge and Learning*, 23

Twining, P.; Butler, D.; Fisser, P.; Leahy, M.; Shelton, C.; Forget-Dubois, N.; Lacasse, M. (2021) 'Developing a quality curriculum in a technological era'. *Educational Technology Research and Development*, 69



Leadership



Professional  
Learning



Key role of  
the agentic  
teacher



# Professional Learning

Robust contextually and culturally relevant models of professional learning for teachers and school leaders that are coherent, flexible and sustainable

- Focus on student-centred, creative pedagogies,
- Employ interdisciplinary approaches and project tasks to engage learners in real-world problem solving
- Create meaningful student-teacher connections using digital technologies

Supported within a learning culture that encourages educators to work with others to critically and purposefully use a range of digital technologies for teaching, learning and assessment.

Aspects	Progression		
	Acquisition	Deepening	Creation
Human-centred mindset	Benefit-risk analysis	Human accountability	AI society responsibility/ Social human agency
Ethics of AI	Ethical principles	Safe and responsible uses	Co-creating commons of AI ethics
AI foundations & applications	Basic AI technique and applications	Application skills	Creating with AI
AI pedagogy	AI-assisted teaching	AI-pedagogy integration	AI-enhanced pedagogical transformation
AI for professional development	AI as enabler of lifelong professional learning	AI to enhance organizational learning	AI to support professional transformation



**AI competency framework for teachers (AI CFT) under development**

Aspects	Progression		
	Understand	Apply	Create
Human-centred mindset	Human agency	Human advancement	Citizenship in the AI era
Ethics of AI	Critical reflections on AI	Safe and responsible Use	Ethics by design
AI techniques and applications	AI foundations	Application skills	Creating with AI
AI system design	Problem scoping	Architecture design	Iteration and feedback loops

**AI competency framework for school students (AI CFS) under development**



**unesco**  
United Nations  
Educational, Scientific  
and Cultural Organization



## Ethical guidelines on the use of AI and data in teaching and learning for Educators

### What do they include?

- ▶ **A contextualisation of the objectives and possible use of AI in education**, as well as a series of **ethical considerations arising from them**
- ▶ **An explanation of the challenges of using AI techniques and data** for teaching and learning purposes
- ▶ **A series of questions related to the ethical and practical considerations of implementing AI and data-based resources** and tools and advice on how to adapt them to different particular purposes and contexts
- ▶ **A set of emerging skills** for confident use of resources and tools or on the use of key technical terms in the field of education



### How will they help teachers?

- ▶ **Fostering awareness and knowledge acquisition** regarding the ethical use of AI and data in teaching and learning
- ▶ **Engaging teachers and educational staff to assess and share their experience in providing information** deriving from diverse contexts
- ▶ **Identifying concrete examples** and guiding questions to build projects and use AI and data in an ethical manner
- ▶ **Proposing methodology and guidance to develop digital competences** and evaluate the relevance of using AI and data for various purposes in different contexts with confidence

# Artificial Intelligence for and by teachers

Erasmus+ project which aims to explore and support the use of AI in education.

[About](#)

## Our News

02.10.2023 8:13



### Empowering teachers: AI4T Massive Open Online Course

As of today, the AI4T MOOC are accessible to everyone! We invite all educators, school leaders, education stakeholders and policy makers, as well as other interested parties, to view, try and do the training themselves.

03.08.2023 11:21



### Teachers' competences – Briefing report No. 1

EU Digital Education HUB, AI Squad Report No. 1: Teachers' competences – teaching with, about and for AI. First of the seven reports.

[Read More](#)

26.07.2023 14:09

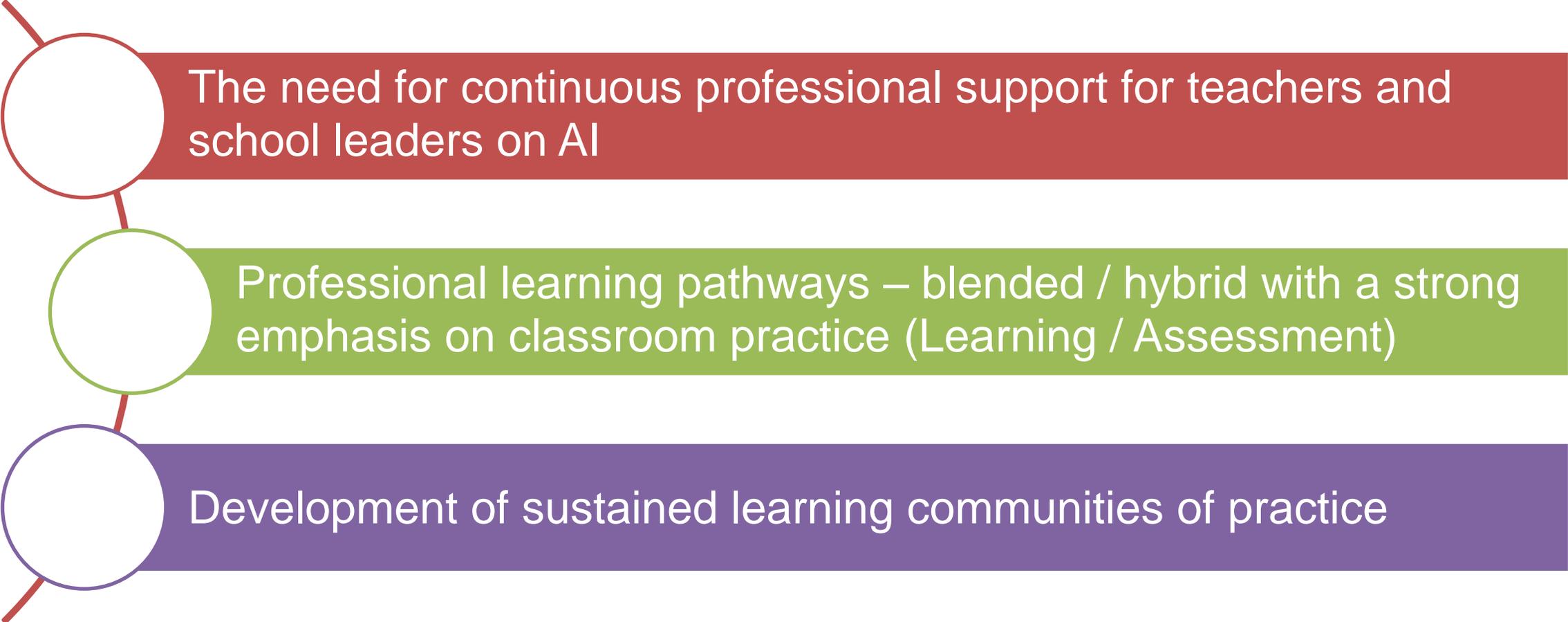


### Join us at the Final Project Conference!

[Read More](#)

<https://www.ai4t.eu>

# Professional Learning

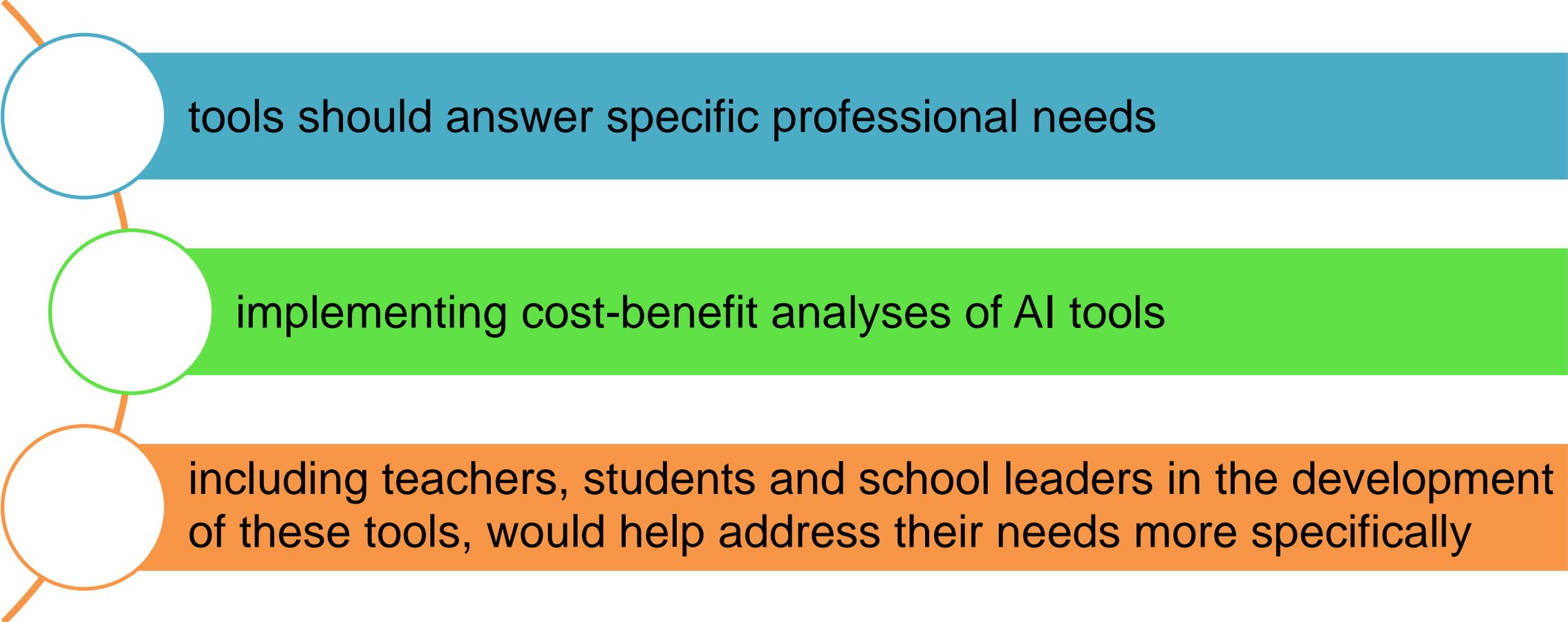


The need for continuous professional support for teachers and school leaders on AI

Professional learning pathways – blended / hybrid with a strong emphasis on classroom practice (Learning / Assessment)

Development of sustained learning communities of practice

# Development of AI tools



tools should answer specific professional needs

implementing cost-benefit analyses of AI tools

including teachers, students and school leaders in the development of these tools, would help address their needs more specifically

# Addressing ethical issues

Students were mostly concerned with the potential **loss of privacy** resulting from the collection of personal data by AI tools, but also with the **potential use of AI for illegitimate intents**, and with the difficulty of **attributing responsibility** when AI makes decisions for humans.

Teachers thought that AI use in schools would **increase private companies' influence on schooling (52.9%)**, **surveillance in schools (49%)**, and **place personal information at greater risk of being breached and used at people's expense (54.9%)**.

Teachers / School leaders emphasised need for the development of **ethical guidelines for development / use of AI tools** in tandem with some form of monitoring by national institutions.

Teachers also highlighted issues of **equity in education**, emphasising the need for fair treatment of all students when assessing their work, ensuring that all students have access to AI tools, as well as considering the data being collected and shared



Welcome to the online think-tank for primary school teachers, educators, and anyone willing to actively and creatively engage children and teachers to promote Artificial Intelligence and Data literacy and awareness.

#### BEING A DIGITAL LEARNER IN THE ERA OF AI AND BIG DATA?



*Being a digital learner does not only mean using technology and understanding technology, it is more than that. Being digital learners means being learners in an era where technology is used and understanding how it affects our lives. It means having the opportunity to learn how technology works and how to use technology to enhance creativity and critical thinking, to encourage collaborative real-world problem solving and to empower ethical, critical, and aware choices and actions*  
(NCCA, 2020)



Teaching AI Handbook 

<https://teachingai.eu/>

# Leadership

Effective school leadership is needed to enable staff to engage in a process to identify specific actions for changes in teaching, learning and assessment linked to shared school policy in relation to the use of AI etc.

Need to support school leadership to engage in developing this type of learning culture (i.e. effective professional learning for school leaders)

School leaders need to be empowered to recognise when help is needed and supported to draw on a range of external and in school supports as required.

# Key role of the Agentic Teacher

---



Understanding of what being digital in learning can be (why it is important), how learning experiences can be designed to enable its development and how it can be assessed.



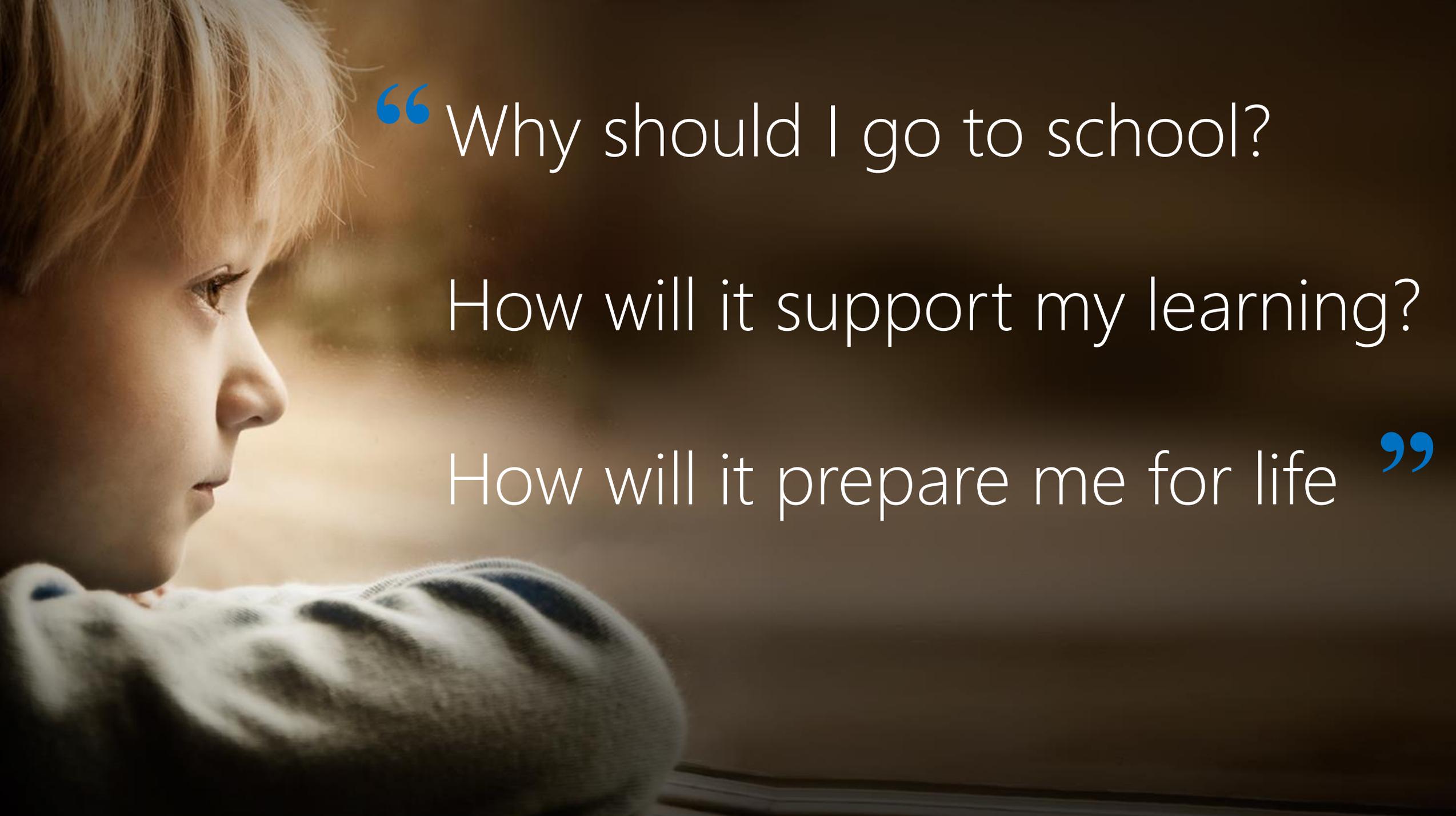
Need to invest substantial effort and resources into creating, and co-creating with teachers, a sufficiently detailed description of the meaning of 'being a digital learner'.



Thoughtful consideration of how professional learning opportunities can be developed for teachers.



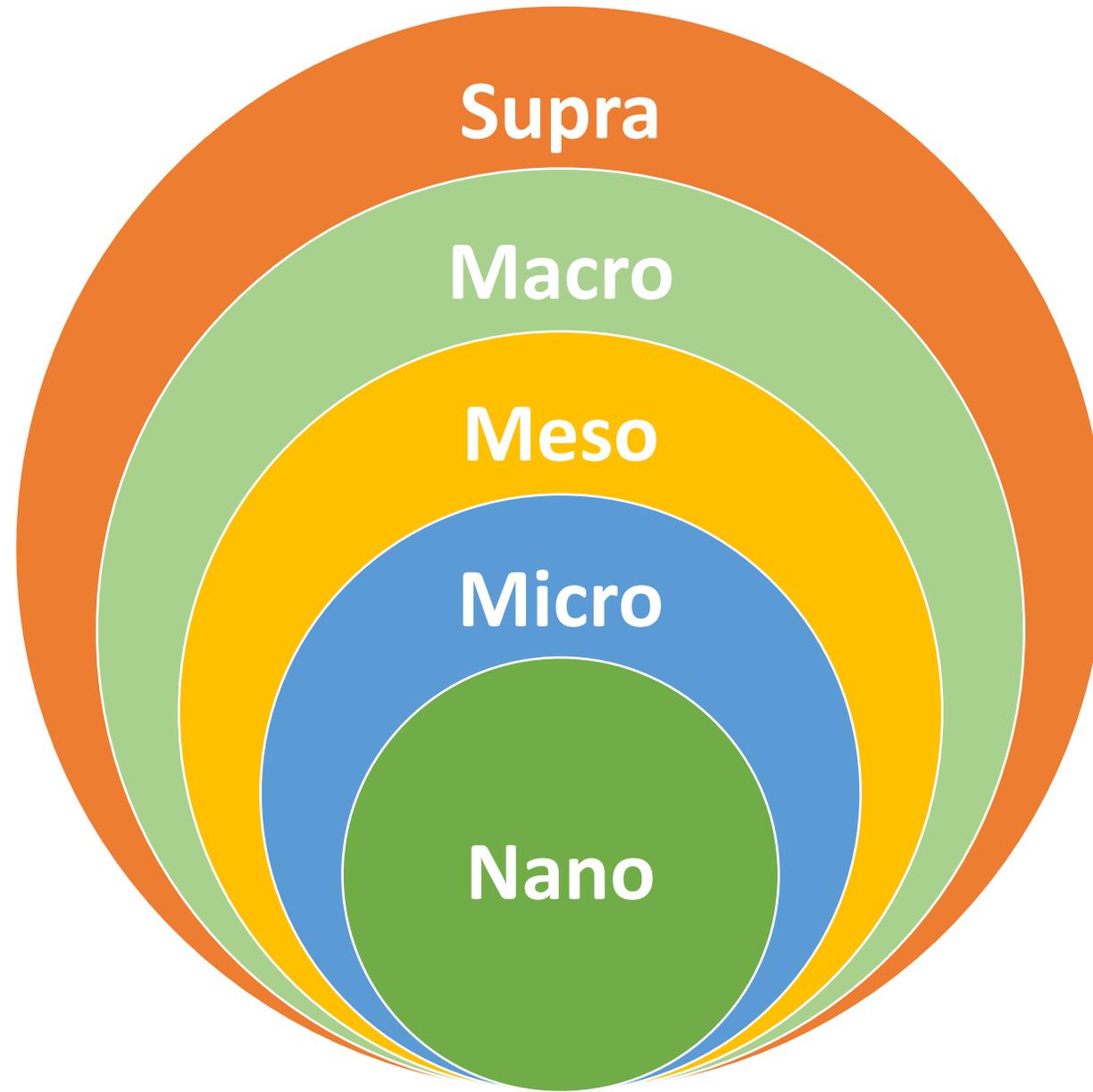
Requires changing beliefs about digital technologies and challenging assumptions around the effective use of digital technologies in learning by articulating clearly what effective classroom practice looks like.

A young child with light brown hair is shown in profile, looking out of a window. The child is wearing a grey sweater. The background is a soft, out-of-focus view of a landscape, possibly a field or park, with warm lighting suggesting a sunset or sunrise. The text is overlaid on the right side of the image.

“ Why should I go to school?

How will it support my learning?

How will it prepare me for life ”



**Supra**

**Macro**

**Meso**

**Micro**

**Nano**