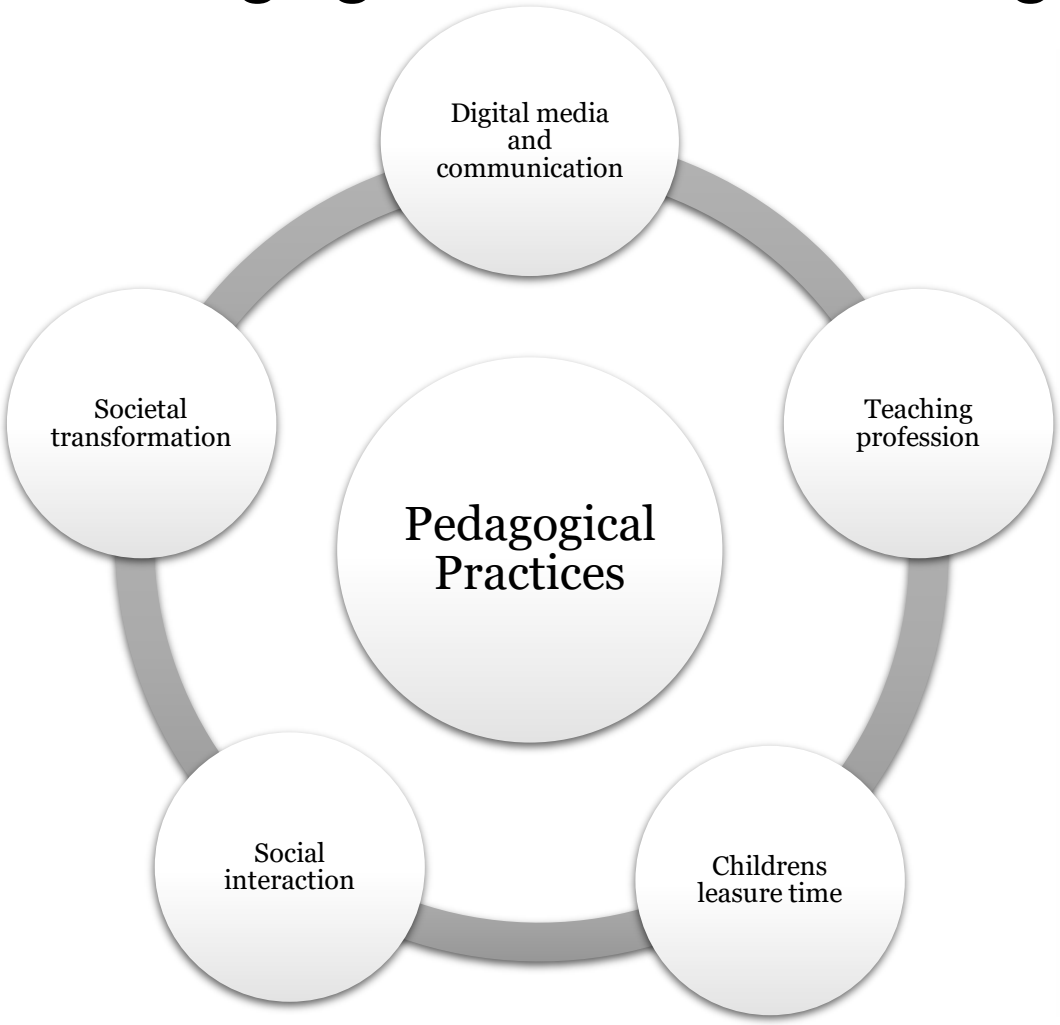
BEYOND F(AI)TH

AI in the future of teaching and learning

Katarina Sperling, PhD student, Pedagogical Practices, 240524

LINKÖPINGS UNIVERSITET

Pedagogical Practices: Digital Media and communication



Digital Media and communication

AI literacy in Teacher Education

AI literacy in Primary Education

Automation and Augmentation

AI and assessment

The embodiement of reading

Social robots and reading

Visual literacy and multimodality

AV 1 robots in teaching

Co-funded by the Erasmus+ Programme of the European Union

Empower 2 Learn

Welcome to the toolkit from the Empower2Learn project, where we want to **inspire** you to **personalise your teaching**! This toolkit offers a **collection of interesting tools** that you can explore, **building blocks** that can help you to design your personalised teaching approach with or without a tool, **interesting literature on this subject,** as well as more **information** on the **project** and the **partners** involved.

You can use the navigation **bar on top** or the **buttons below** to quickly find what you are looking for!

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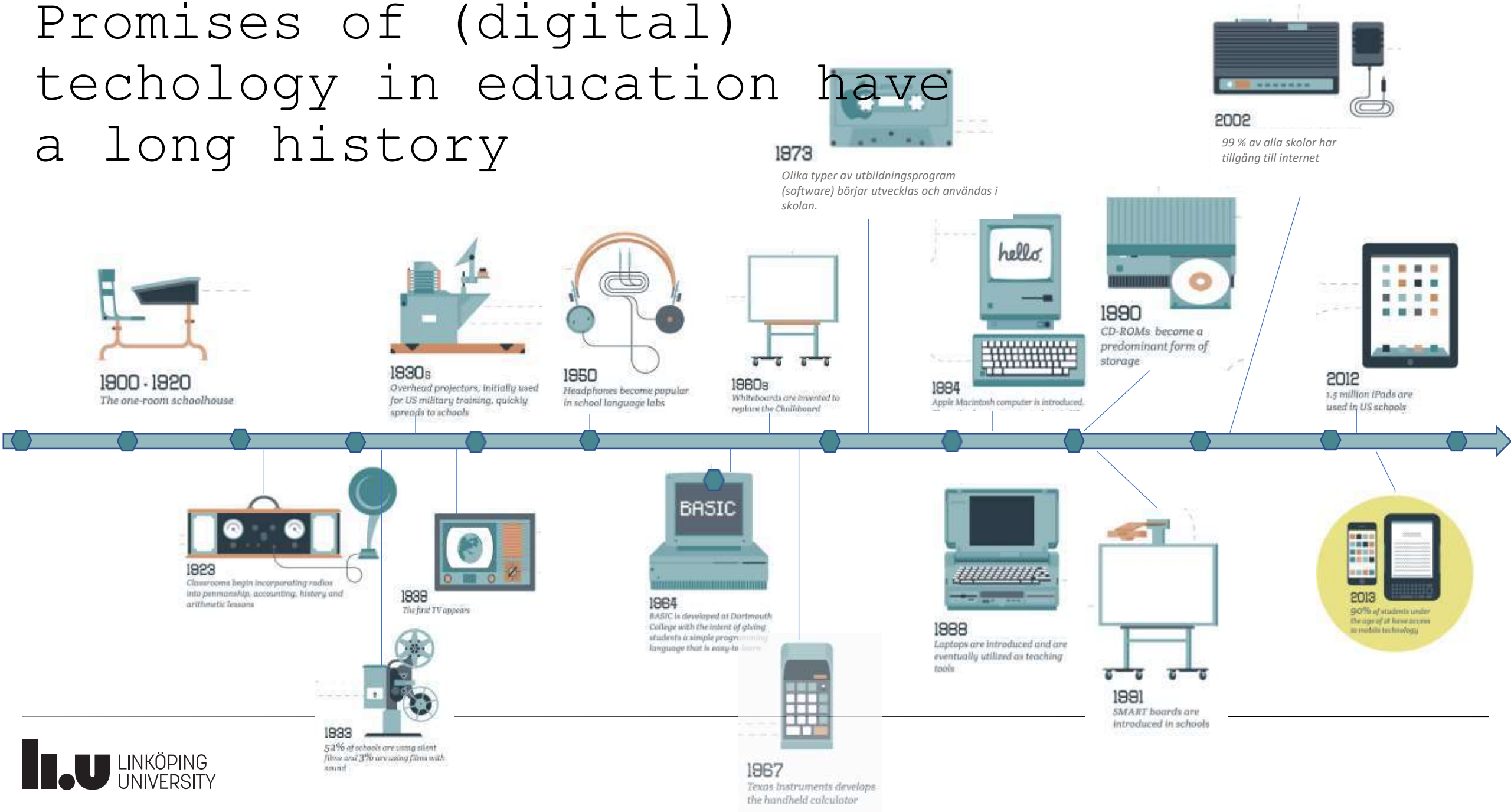
PERSON of the YEAR
TIME
Chat GPT

AI and Education

#1 more than Chat-GPT
#2 not ””simply” a tool
#3 requires a critical mindset

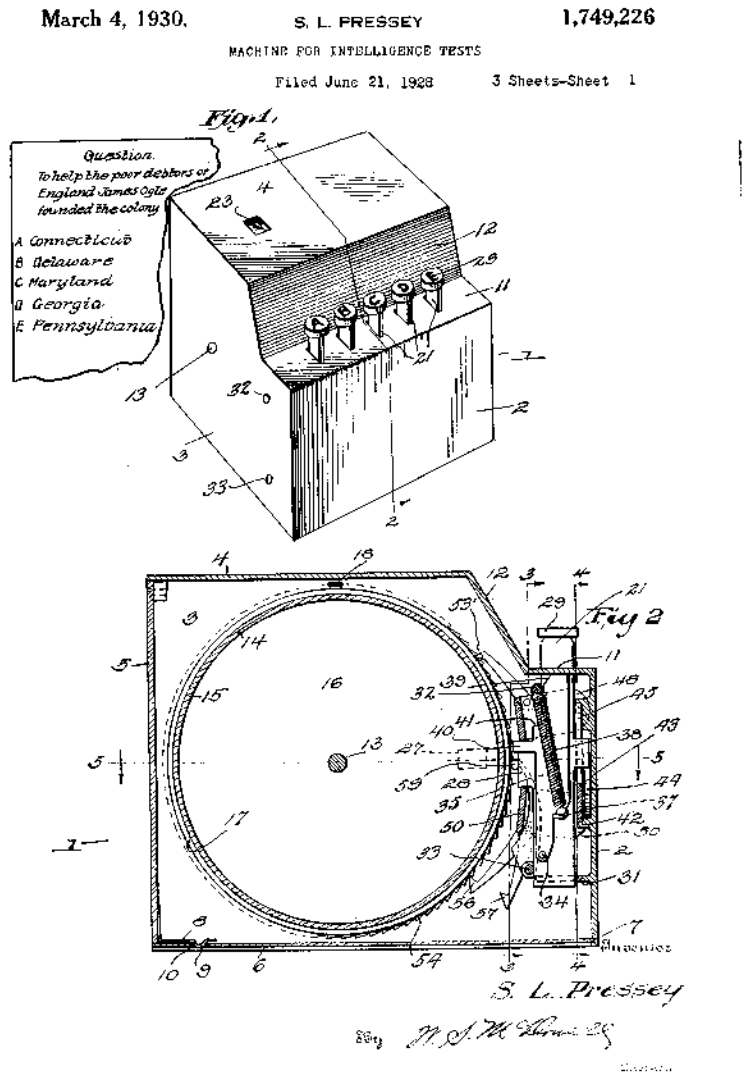
#1. AI is more than Chat GPT addressing problems that have not primarily been formulated by teachers

Promises of (digital) techology in education have a long history



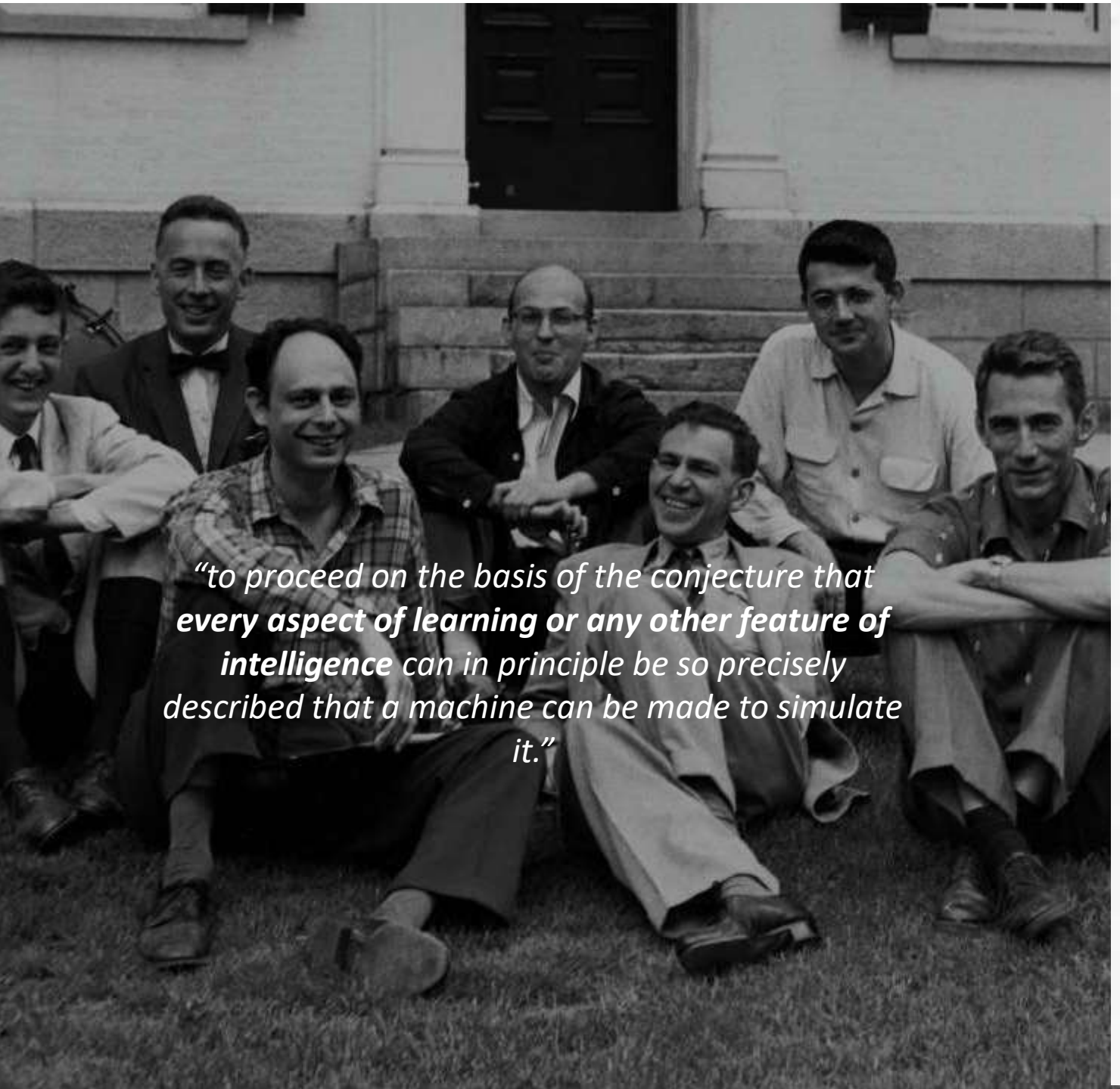
Mekanisering, rationalisering, effektivise

"a new profession known as 'teaching Engineer,' that ***kind of engineering which is concerned with the educational process*** *and with the design of the machines, as well as the design of the material."* - Simon Ramo, 1957



Teaching machines, programmed teaching (Pressey & Skinner)

Radio & TV, mechanical teaching(Edison)



*"to proceed on the basis of the conjecture that **every aspect of learning or any other feature of intelligence** can in principle be so precisely described that a machine can be made to simulate it."*

A Proposal for the

DARTMOUTH SUMMER RESEARCH PROJECT ON ARTIFICIAL INTELLIGENCE

June 17 - Aug. 16

We propose that a 2 month, 10 man study of artificial intelligence be carried out during the summer of 1956 at Dartmouth College in Hanover, New Hampshire. The study is to proceed on the basis of the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it. An attempt will be made to find how to make machines use language, form abstractions and concepts, solve kinds of problems now reserved for humans, and improve themselves. We think that a significant advance can be made in one or more of these problems if a carefully selected group of scientists work on it together for a summer.

The following are some aspects of the artificial intelligence problem:

1) Automatic Computers

If a machine can do a job, then an automatic calculator can be programmed to simulate the machine. The speeds and memory capacities of present computers may be insufficient to simulate many of the higher functions of the human brain, but the major obstacle is not lack of machine capacity, but our inability to write programs taking full advantage of what we have.

2) How Can a Computer be Programmed to Use a Language

It may be speculated that a large part of human thought consists of manipulating words according to rules of reasoning

Minsky and the meat machine

1. The brain and thinking (learning) are based on biological processes.

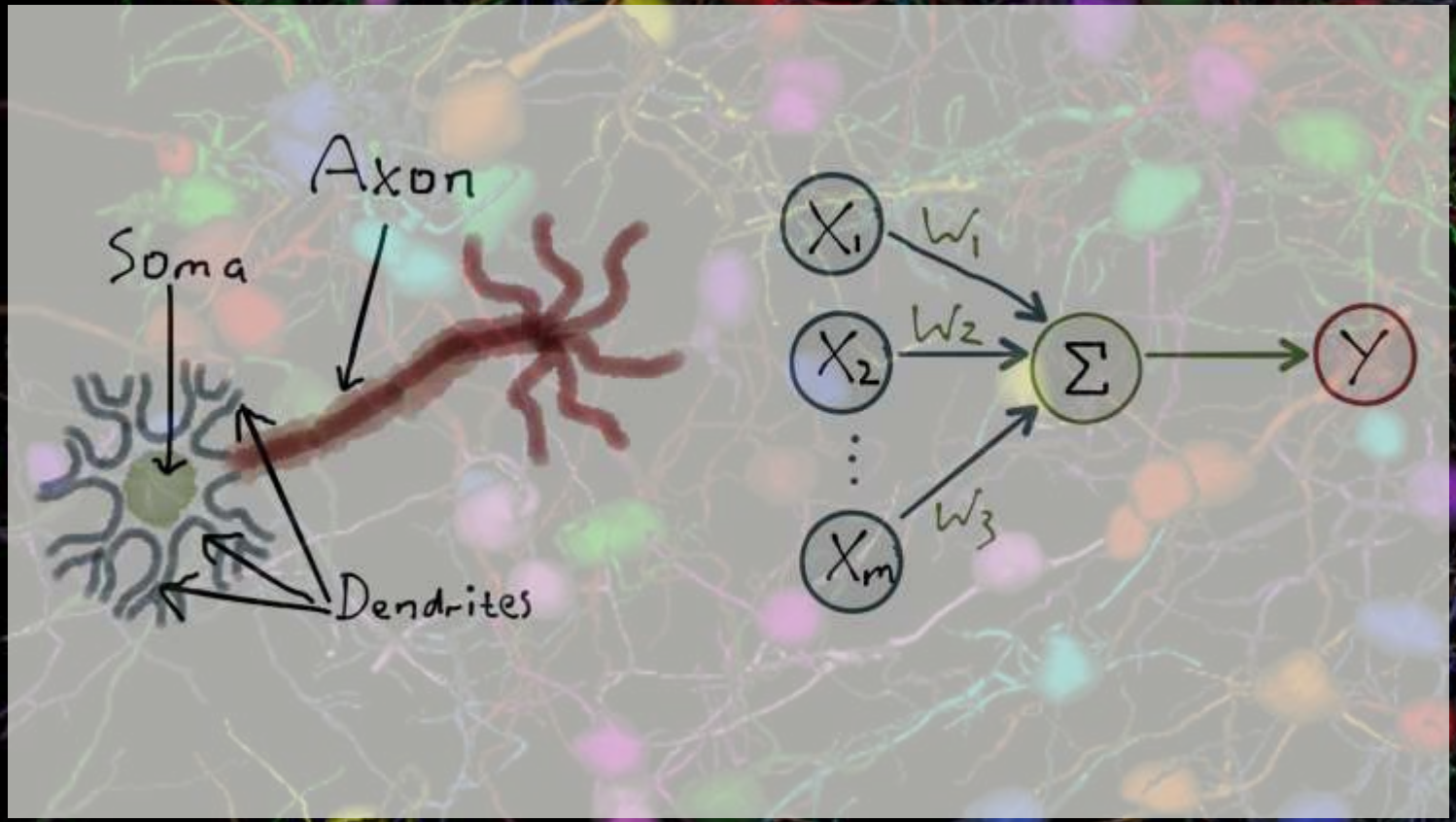
2. These processes can be modeled as computations in other things besides flesh (e.g., computers).

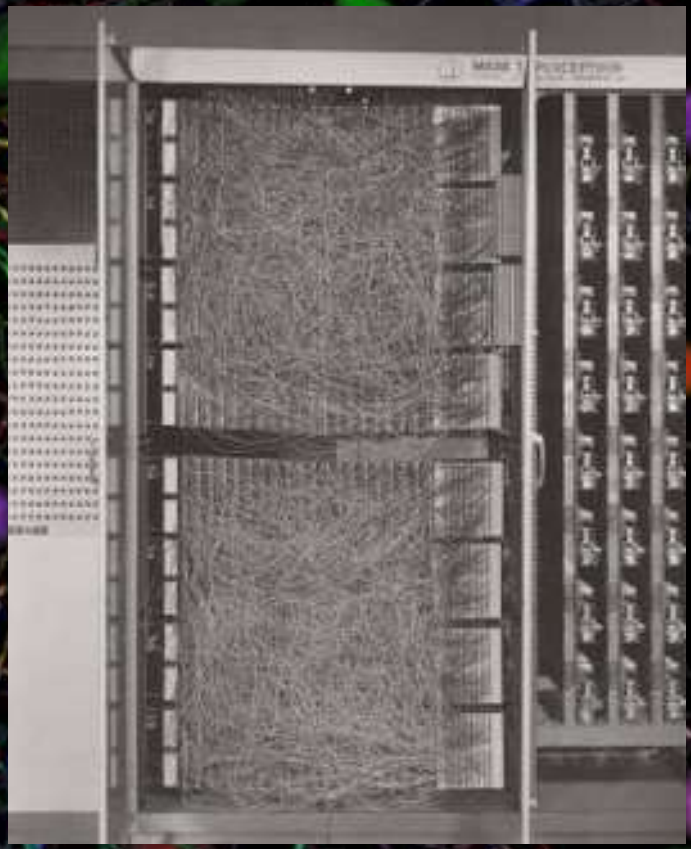
3. Research on AI can be understood as:

    a. a way to model these processes, and

    b. to build useful applications.

”Artificial Neurons”- perceptrons

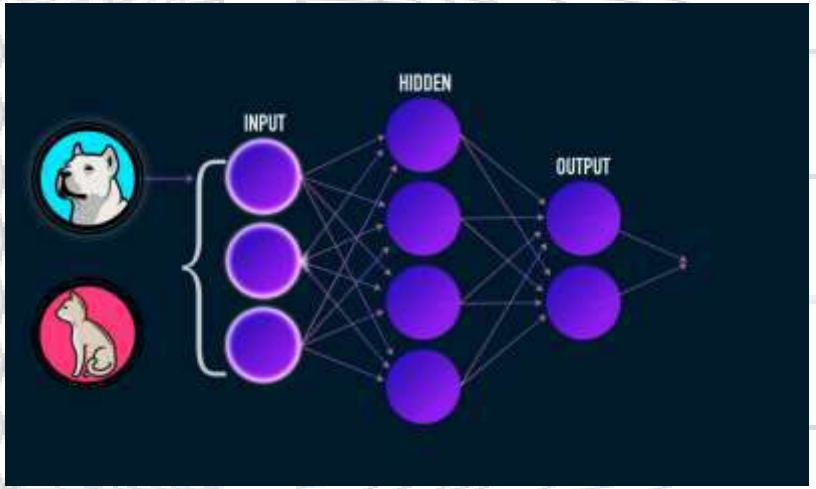




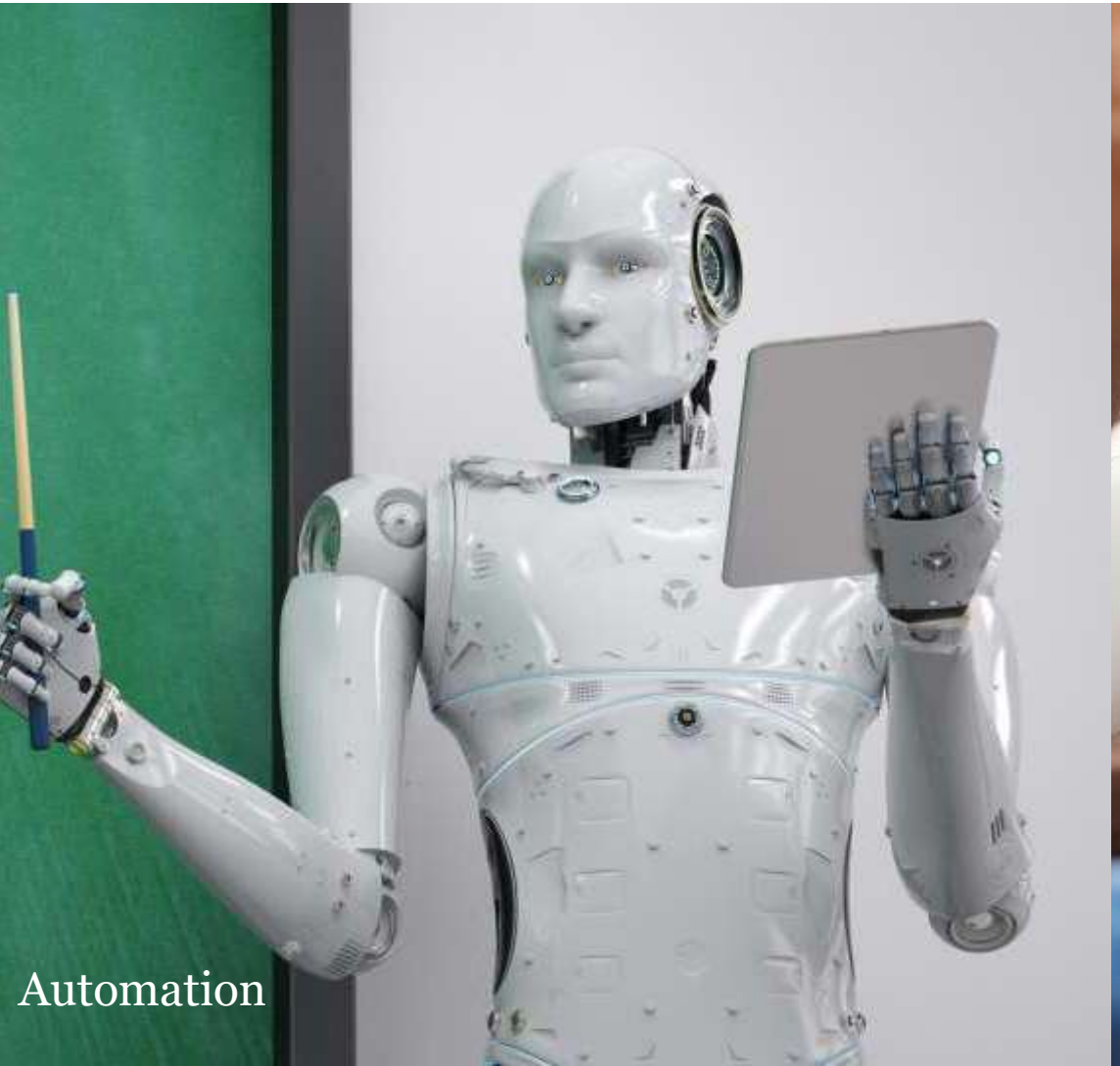
Mark 1 Perceptron (McCulloch & Pitts, 1957)

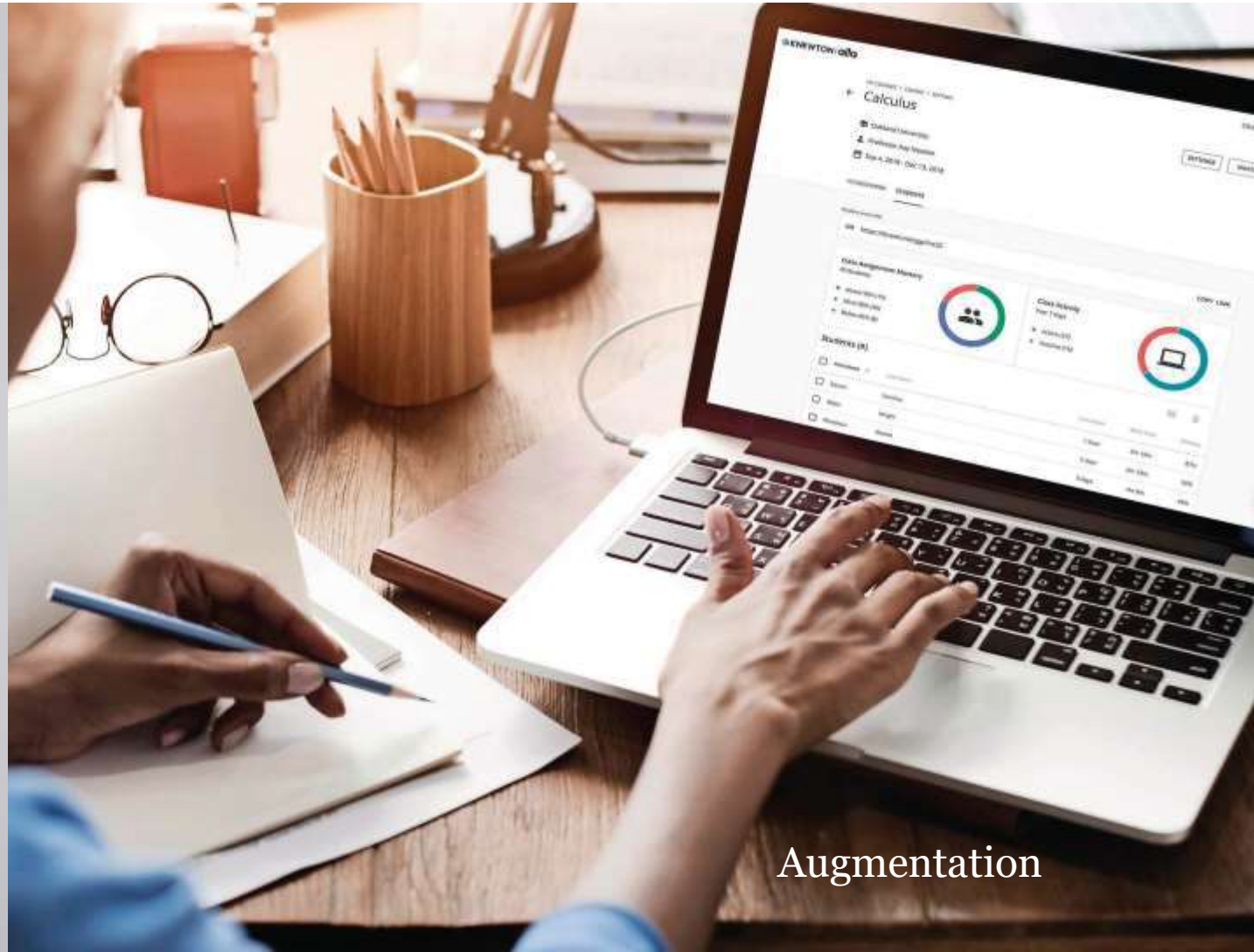
The growth of computing power and data volume in the 2000s enabled new, more advanced models and more extensive training.

The system learns to recognize patterns in data, or rather to predict the probability of X.



.. As well as the research in AI in Education

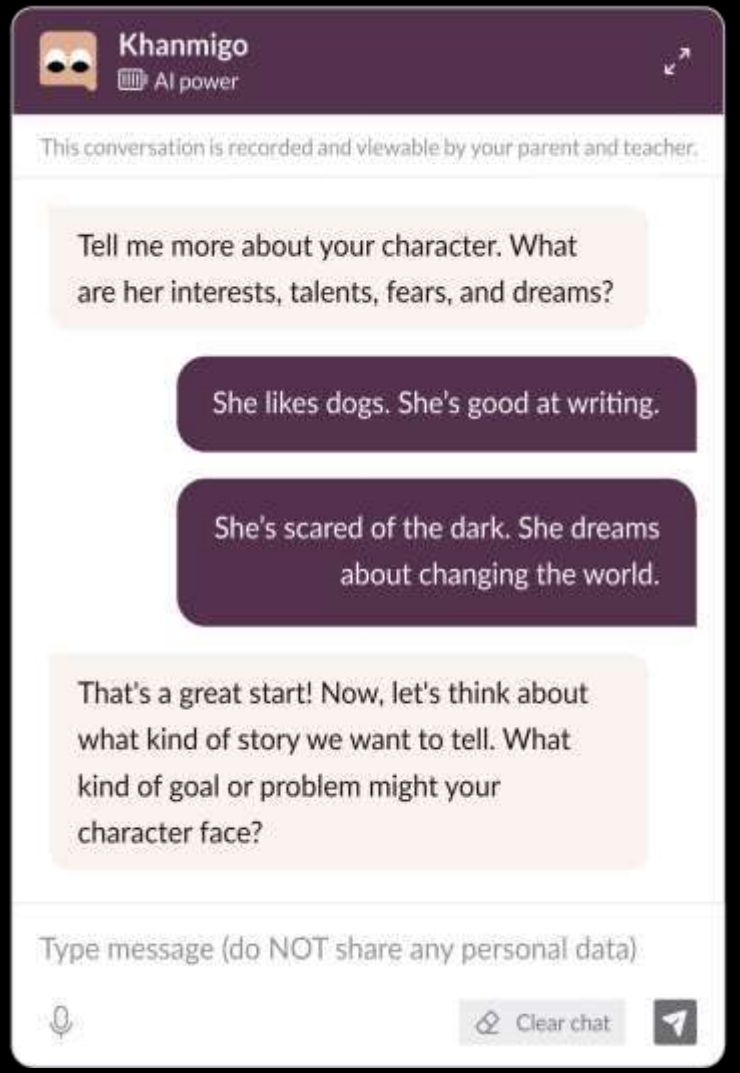




Revitalised through AI

I think we are at the cusp of using AI for probably the biggest positive transformation that education has ever seen and the way we are going to do that is by giving every student on the planet an amazing artificial intelligence personal tutor and we are going to give every teacher on the planet an amazing artificial intelligence teaching assistant

(Sal Khan in his TED talk "*The amazing AI super tutor for students and teachers*" April, 2023).



Shaped by interests of a rapidly growing EdTech industry

.. and incorporated in policy

...with unforeseen risks

#2. AI is not just "a tool" and we don't know how its implementation impacts teachers and students

Automation: An machine based tutoring system

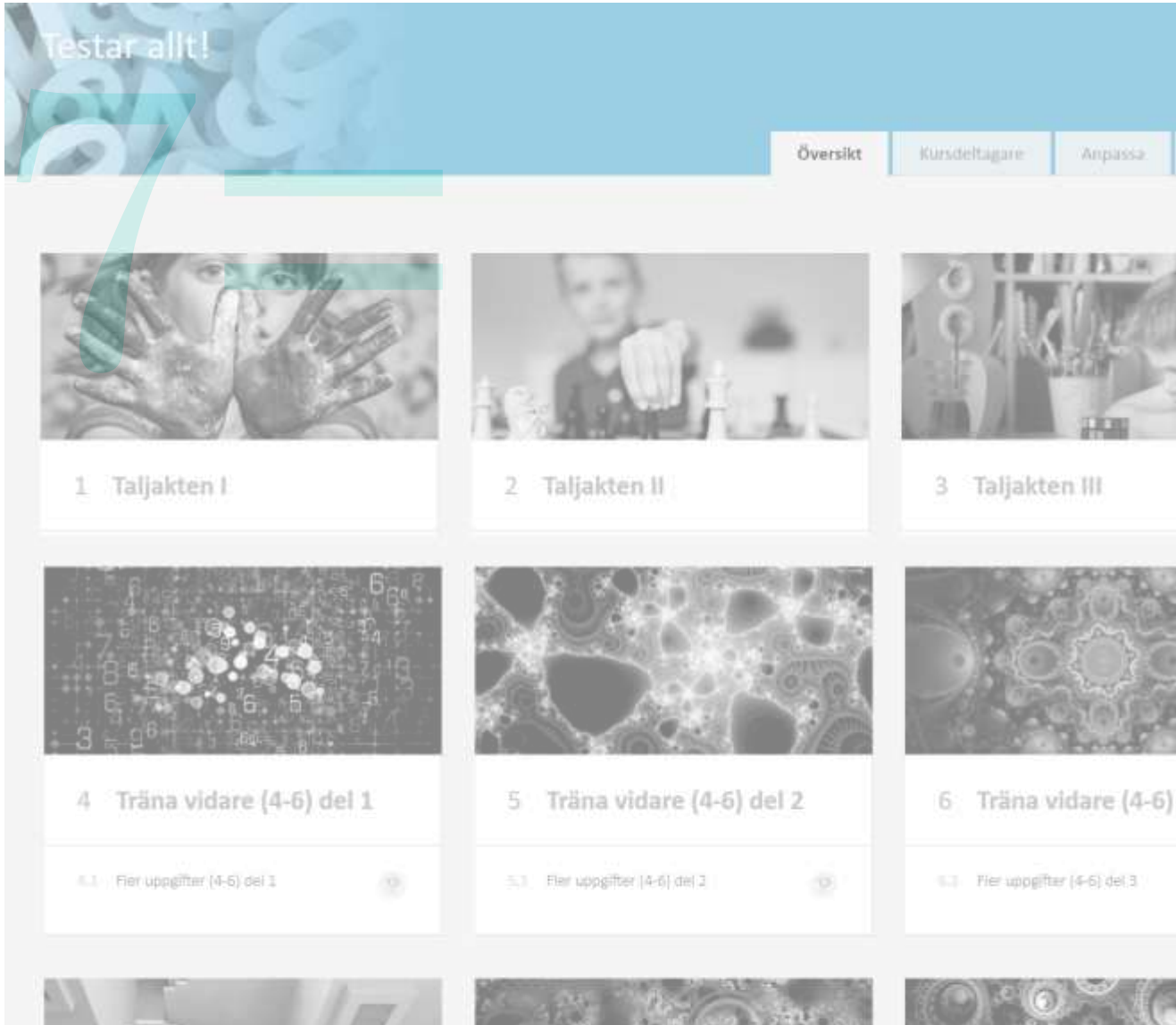
68+1

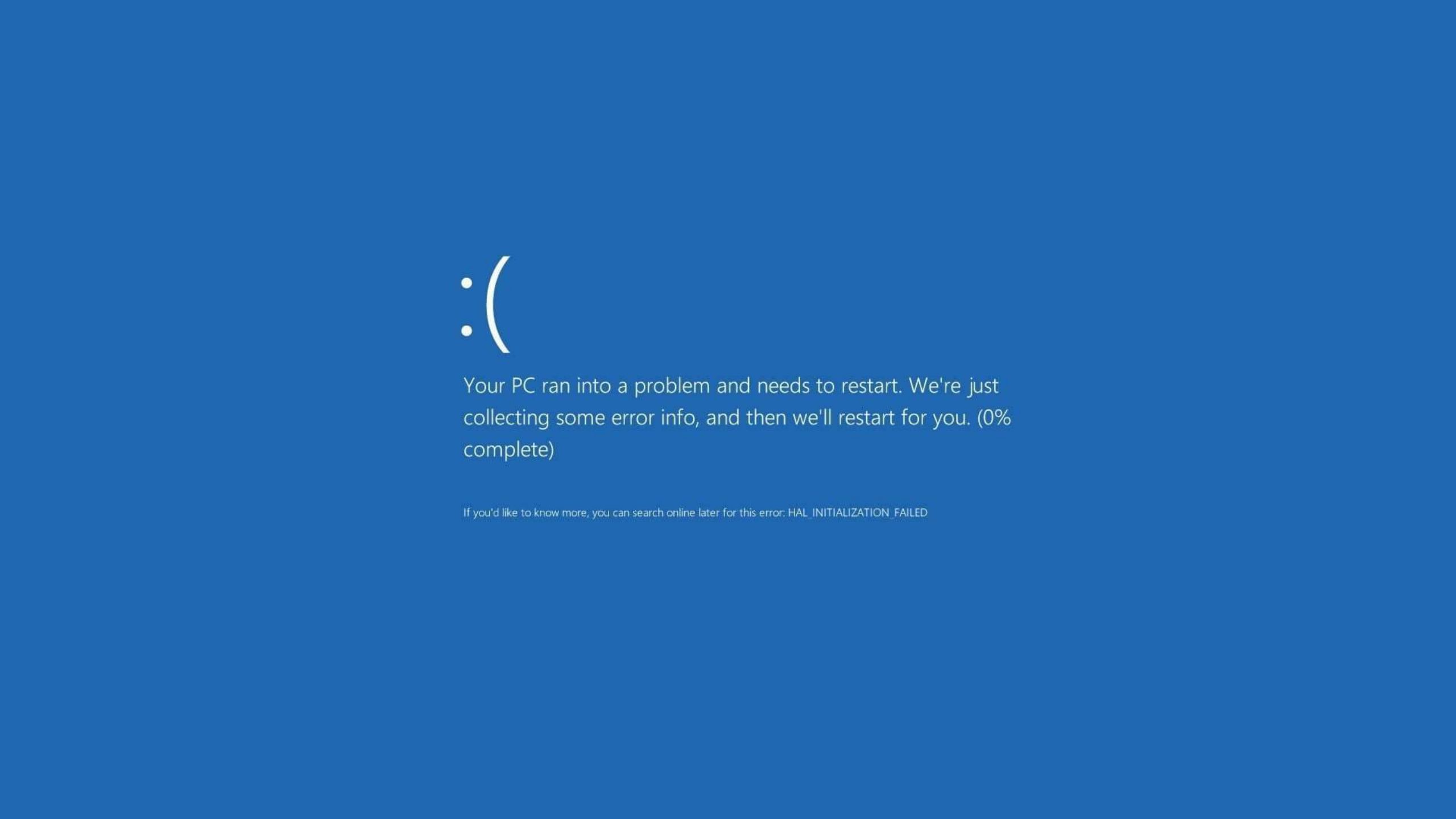
43-17=

4-2=

7X2=

16+5=




:(
Your PC ran into a problem and needs to restart. We're just collecting some error info, and then we'll restart for you. (0% complete)
If you'd like to know more, you can search online later for this error: HAL_INITIALIZATION_FAILED


Sve
var ju såna här programmeringsfel, nu komm
ihåg
men det va
u såhär att 2-1 eh.. blir ju ett..
lat
att
lev j
e... alltså det var fel räknesätt o
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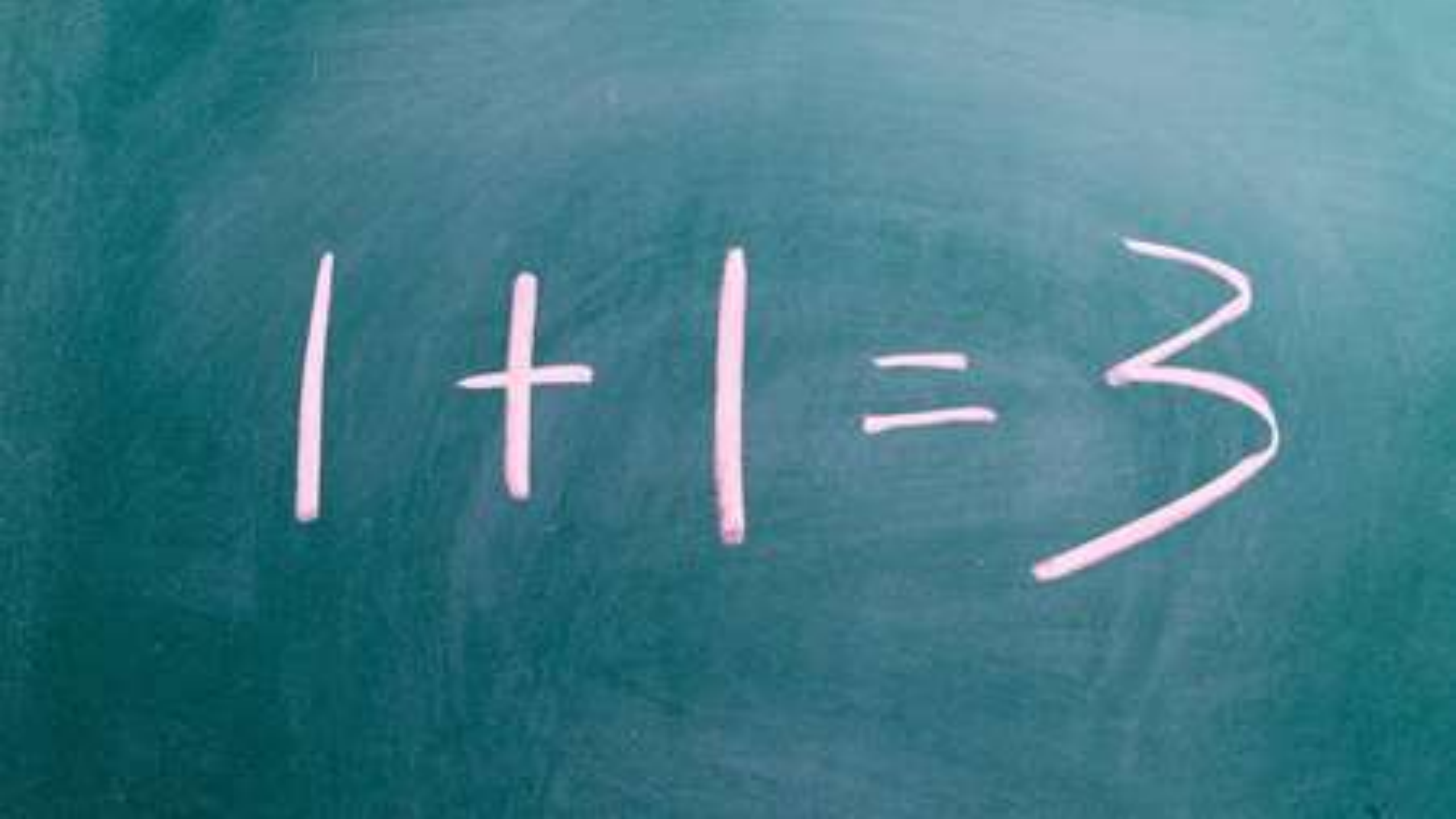
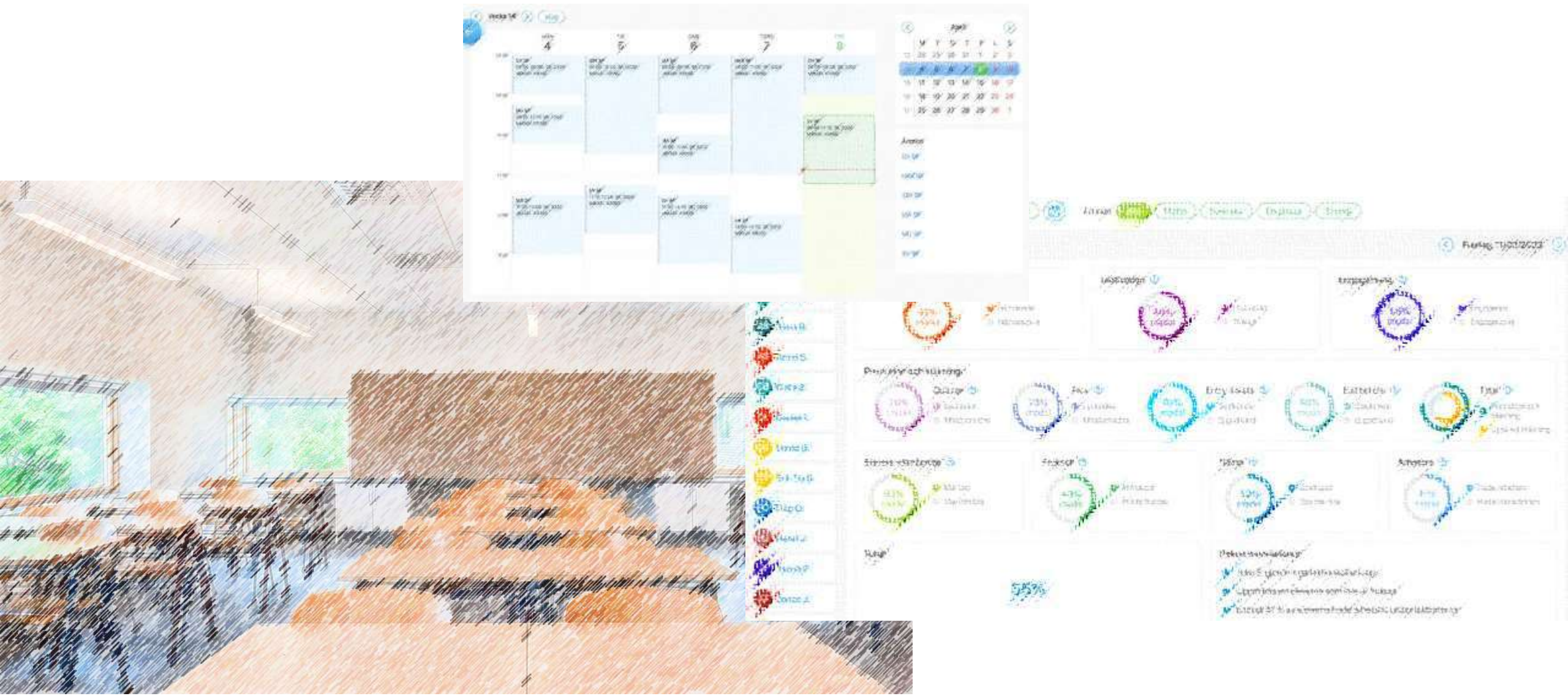

1 + 1 = 3

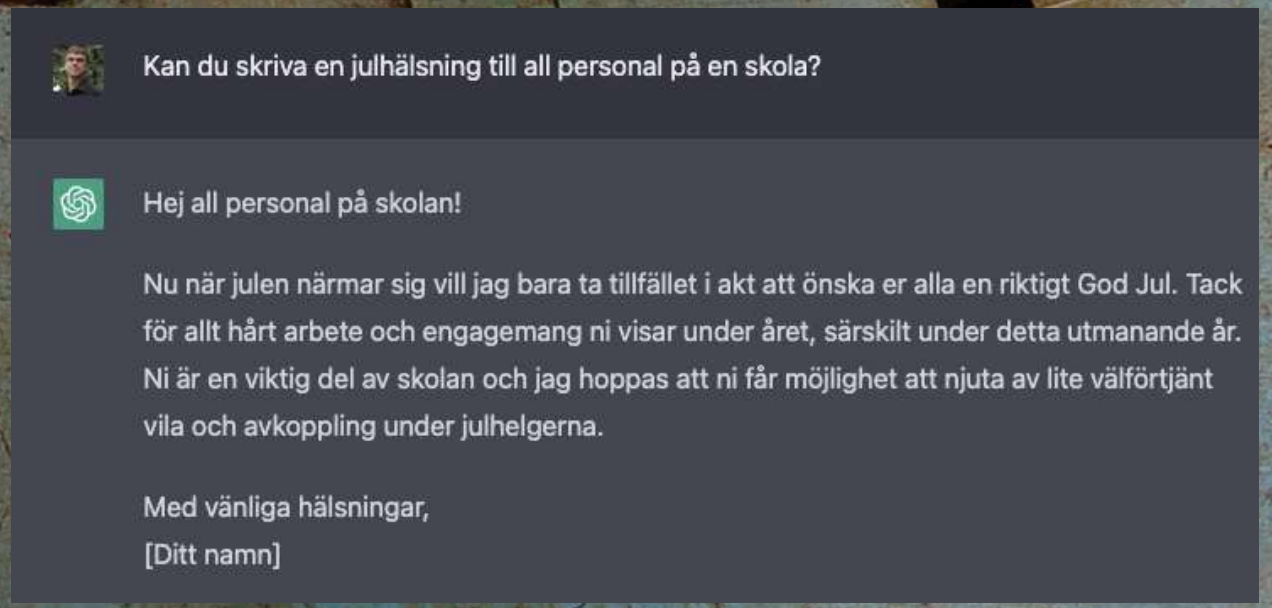
Augmentation: A platform with learning analytics

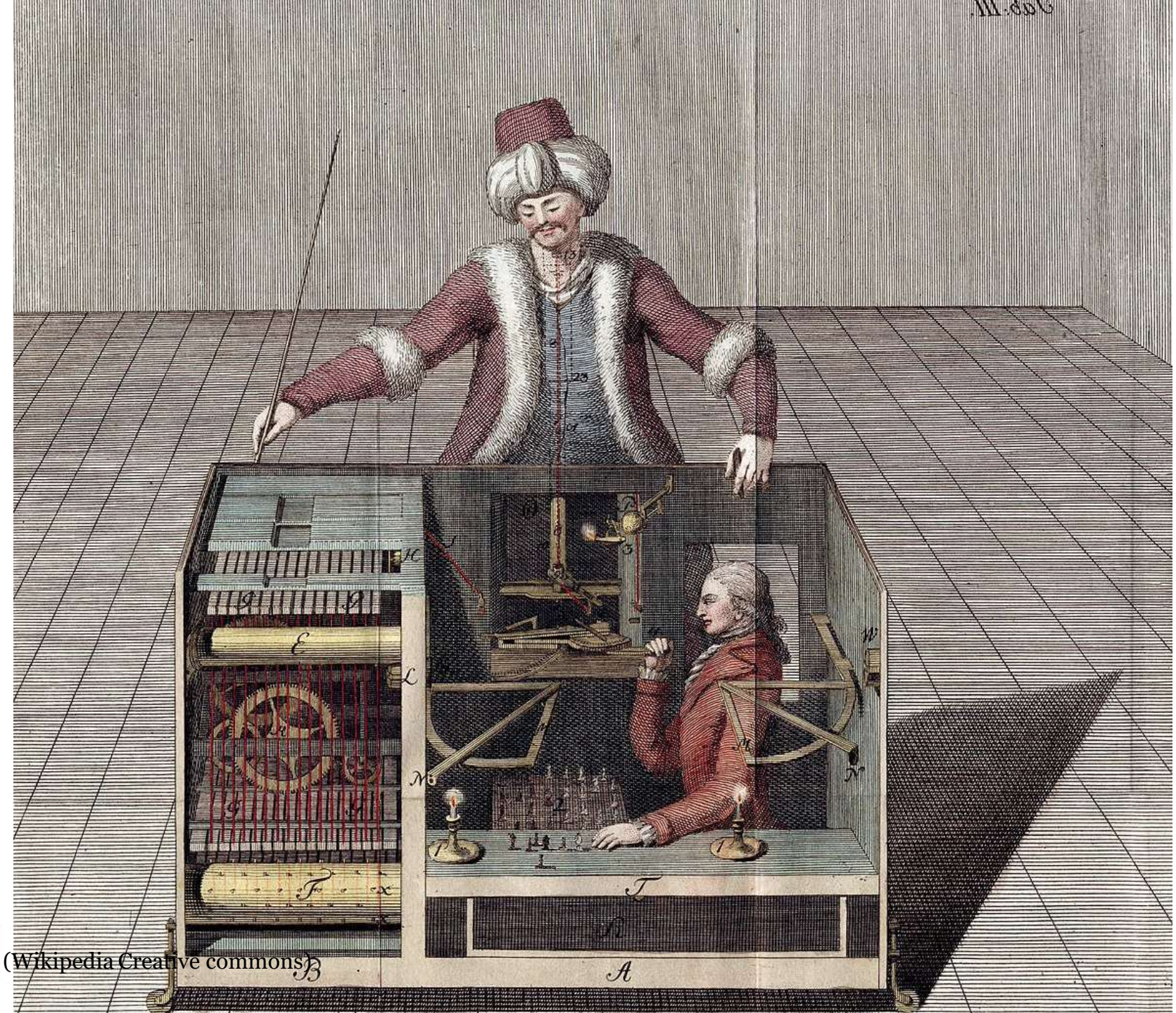



Analytics
Klass NN
Filter
Dag
Vecka
Månad
TOTAL
Morkonkollanalys
< Februari >
E1 Elev 1
E2 Elev 2
E3 Elev 3
E4 Elev 4
E5 Elev 5
E6 Elev 6
E7 Elev 7
E8 Elev 8
E9 Elev 9
E10 Elev 10
jag är inte förvånad över att jag ser att det är mycket rött där för att det vet jag för att det ser jag ju i klassrummet också.. men i klassrummet och det jag ser i klassrummet är också en del av en magkänsla... här syns det.. här har dom själva också satt sin...

- Create lessons, tests
- Personalised content
- Personalised feedback
- Assessment
- Predictions

How does this cognitive offloading affect teachers professional knowledge?





(Wikipedia Creative commons)

TIME SUBSCRIBE

Exclusive: OpenAI Used Kenyan Workers on Less Than $2 Per Hour to Make ChatGPT Less Toxic

This image was generated by OpenAI's image-generation software, Dall-E 2. The prompt was: "A seemingly endless view of African workers at desks in front of computer screens in a printmaking style." TIME does not typically use AI-generated art to illustrate its stories, but chose to in this instance in order to draw attention to the power of OpenAI's technology and shed light on the labor that makes it possible. Image generated by Dall-E 2/OpenAI

BY BILLY PERRIGO

JANUARY 18, 2023 7:00 AM EST

Dilemmas related to the AI technology

1) Algorithmic bias - where training data has been incorrect and resulted in inaccurate answers.

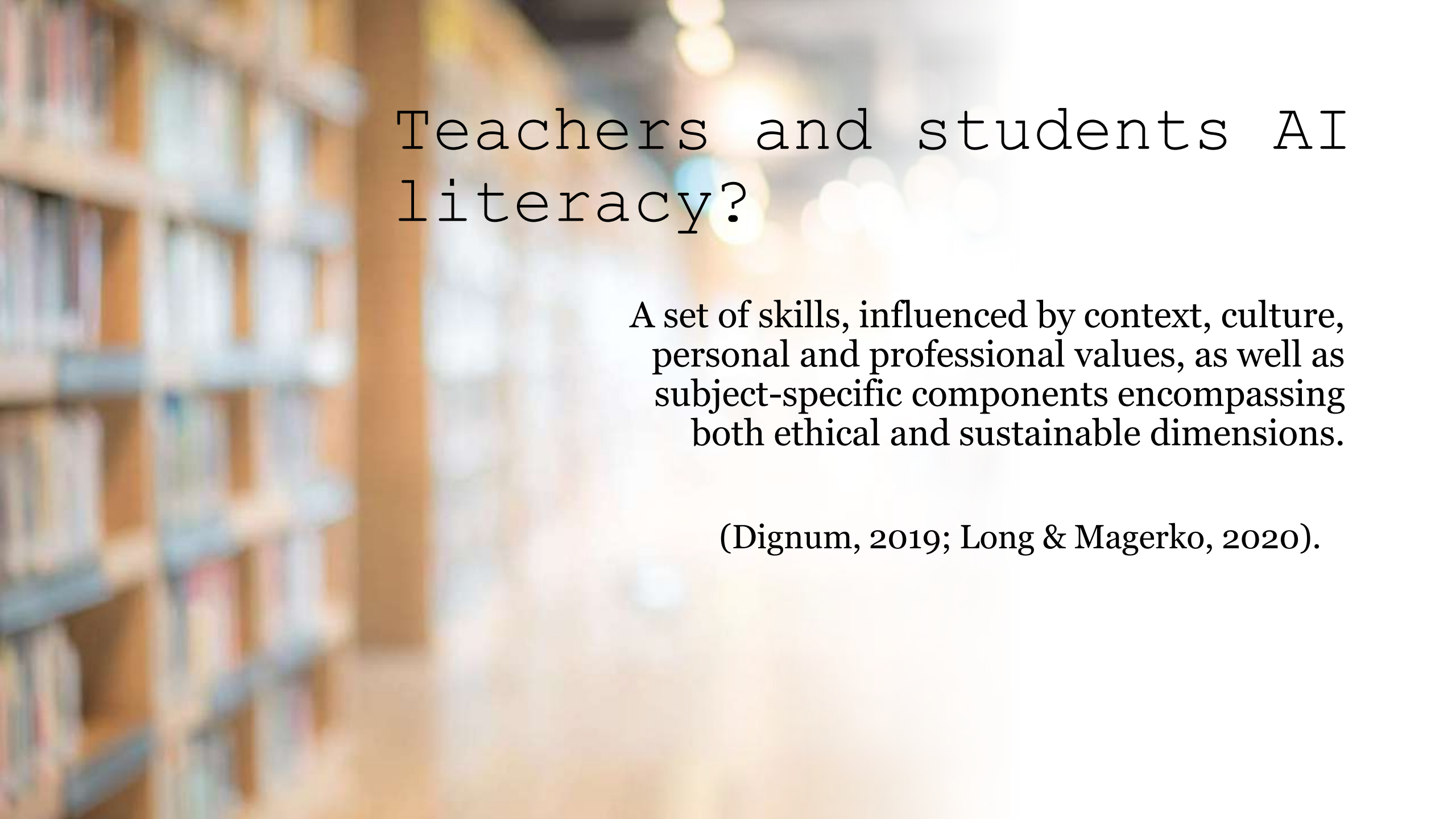
2) Algorithmic decision-making, where there are embedded assumptions about when one has learned something.

3) Inscribed ideas about what learning and teaching is- technologies are not neutral

Dilemmas related to pedagogical practice

- Continuous data collection
- Transparency - teachers, instructional developers, and researchers do not fully understand how these commercial technologies work.
- Algorithms are not "neutral" or objective - they are based on ideas about learning, schools, teachers, and students.
- Extra work - in whose interest?
- The not-knowing perpetuates promises and undermines teachers' belief that they can "see" their students as well as the promised technology.

approach is needed to better decide when different AI technologies should and should not be implemented in educational contexts



Teachers and students AI literacy?

A set of skills, influenced by context, culture, personal and professional values, as well as subject-specific components encompassing both ethical and sustainable dimensions.

(Dignum, 2019; Long & Magerko, 2020).

Aristoteles

- Teoretisk kunskap(episteme)
- Praktisk kunskap(techne)
- Professionellt omdöme(phronesis)

(Kreber, 2015)

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In search of artificial intelligence (AI) literacy in teacher education: A scoping review

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ABSTRACT

Artificial intelligence (AI) literacy has recently emerged on the educational agenda raising expectations on teachers' and teacher educators' professional knowledge. This scoping review examines how the scientific literature conceptualises AI literacy in relation to teachers' different forms of professional knowledge relevant for Teacher Education (TE). The search strategy included papers and proceedings from 2000 to 2023 related to AI literacy and TE as well as the intersection of AI and teaching. Thirty-four papers were included in the analysis. The Aristotelian concepts *episteme* (theoretical-scientific knowledge), *techne* (practical-productive knowledge), and *phronesis* (professional judgement) were used as a lens to capture implicit and explicit dimensions of teachers' professional knowledge. Results indicate that AI literacy is a globally emerging research topic in education but almost absent in the context of TE. The literature covers many different topics and draws on different methodological approaches. Computer science and exploratory teaching approaches influence the type of epistemic, practical, and ethical knowledge. Currently, teachers' professional knowledge is not broadly addressed or captured in the research. Questions of ethics are predominantly addressed as a matter of understanding technical configurations of data-driven AI technologies. Teachers' practical knowledge tends to translate into the adoption of digital resources for teaching about AI or the integration of AI EdTech into teaching. By identifying several research gaps, particularly concerning teachers' practical and ethical knowledge, this paper adds to a more comprehensive understanding of AI literacy in teaching and can contribute to a more well-informed AI literacy education in TE as well as laying the ground for future research related to teachers' professional knowledge.

Introduction

Member states should invest in the level of literacy on AI with the general public through robust awareness raising, training, and education efforts, including (in particular) in schools. This should not be limited to education on the workings of AI, but also its potential impact – positive and negative – on human rights. (Council of Europe, Commissioner for Human Rights, 2019: 14)

AI literacy has recently emerged in a landscape rich with a variety of literacies [1,2], necessitated by the pervasive presence of AI in contemporary society. As exemplified by the introductory quote from the Council of Europe, AI literacy is driven by a democratic imperative to enhance the knowledge of what AI is and its societal consequences, as well as by individuals lacking backgrounds in computer science, mathematics, or AI engineering. This imperative has become particularly directed toward compulsory education, putting teachers' professional knowledge at the centre of the AI literacy discourse. In parallel, the integration of AI based educational technologies into classrooms and universities raises pedagogical and ethical concerns, necessitating an understanding of how AI operates in educational contexts, both in theory and practice [3–5].

AI literacy is already being introduced in various national curricula [6–11], but initiatives to incorporate it into Teacher Education (TE) programmes remain scarce [12]. Given the growing presence of AI in the

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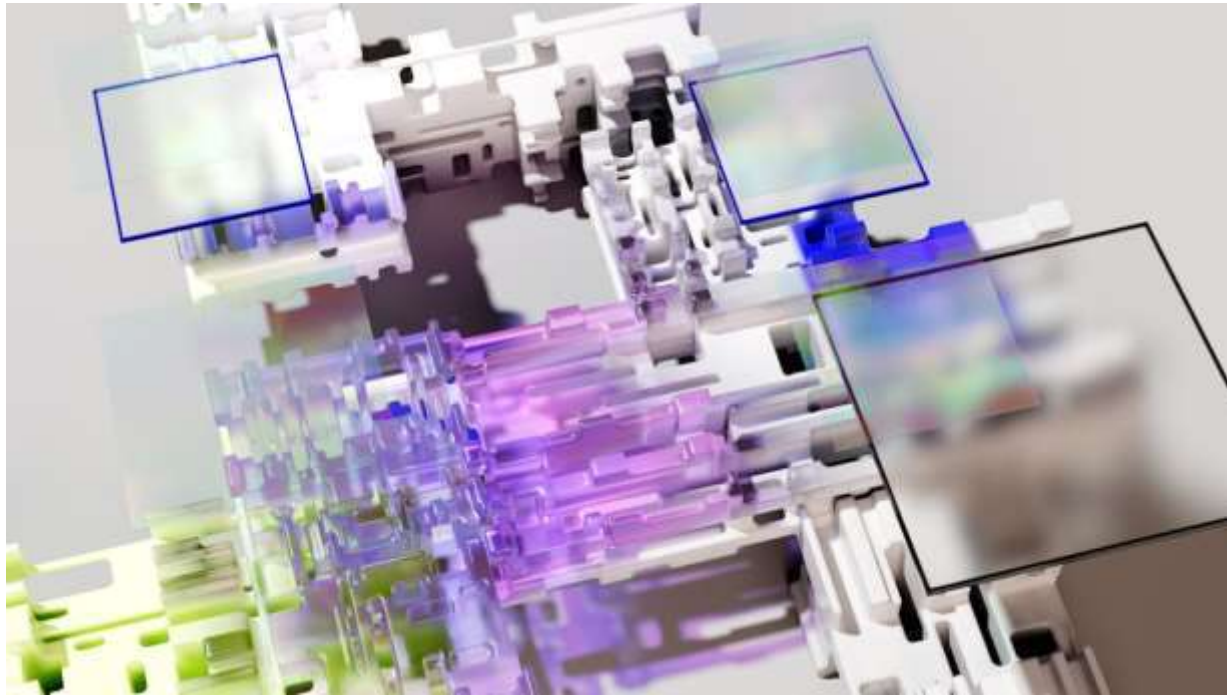
Some tentative conclusions

- Ethics =theoretical rather than a practical situated knowledge
- TE absent in literature
- Lack of classroom studies
- A literacy not yet rooted in the educational sciences
- Many implicit assumption about teachers' theoretical, practical and ethical knowledge
- Focus on developing digital tools to teach AI and implementing AI EdTech in teaching practice

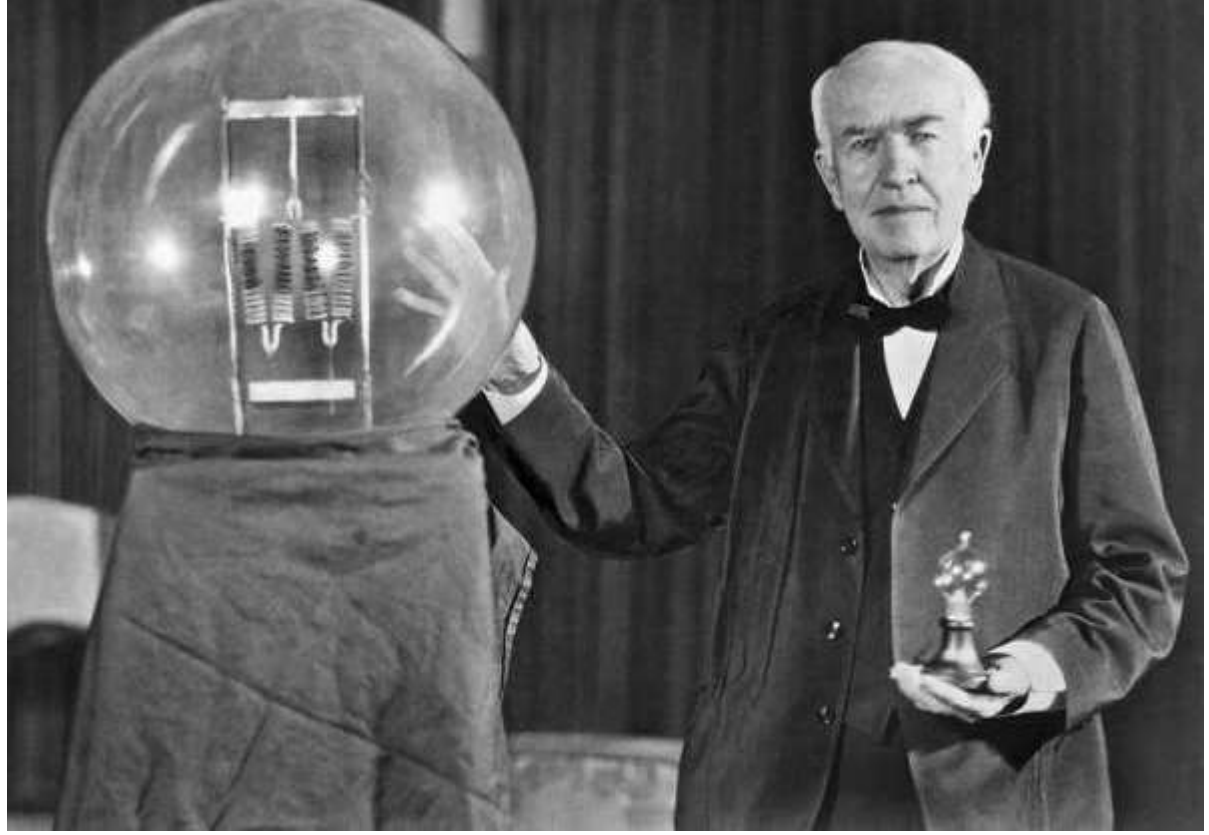


Rose Pilkington, Visualising AI, Google DeepMind

→ Teacher need to be involved in defining AI literacy

Thank you!

katarina.Sperling@liu.se



I believe that the motion picture is destined to revolutionize our educational system and that in a few years it will supplant largely, if not entirely, the use of textbooks.

(Thomas Edison, 1922)