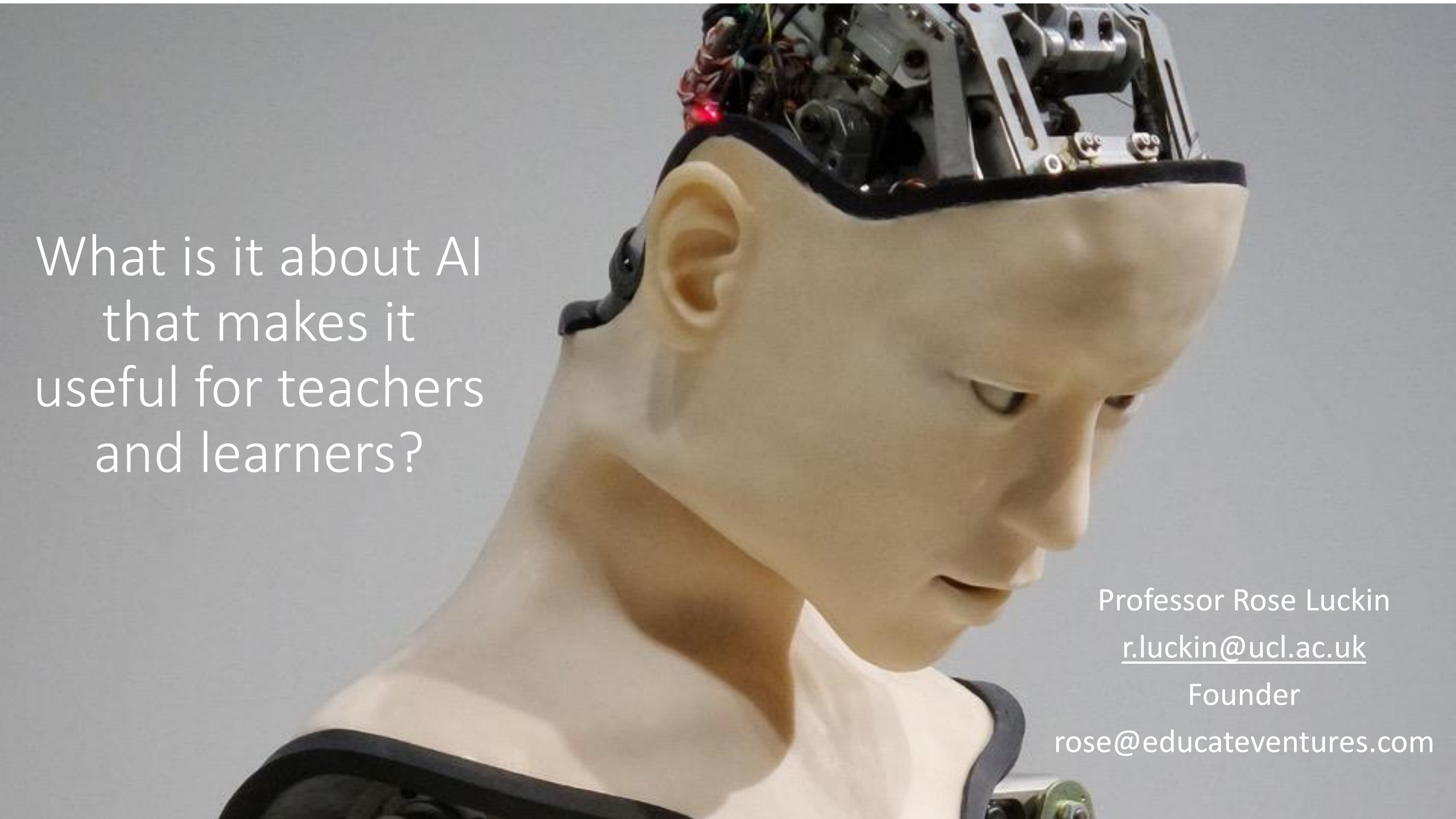
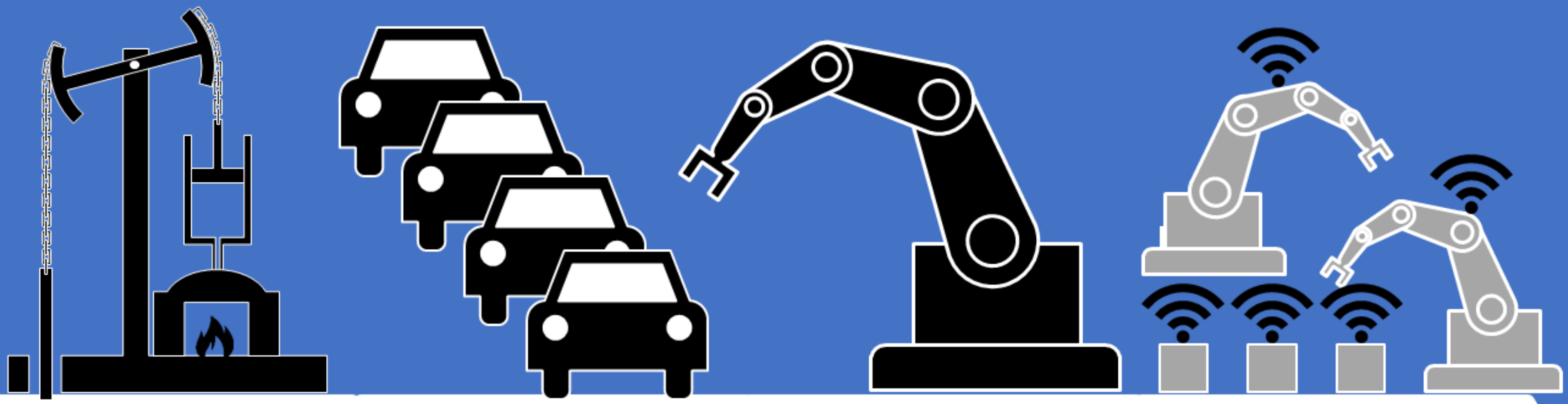


What is it about AI that makes it useful for teachers and learners?

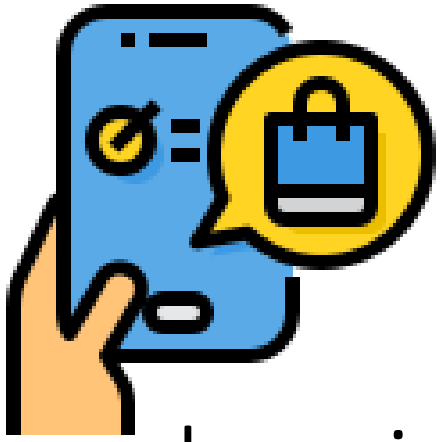
Professor Rose Luckin
r.luckin@ucl.ac.uk
Founder
rose@educateventures.com

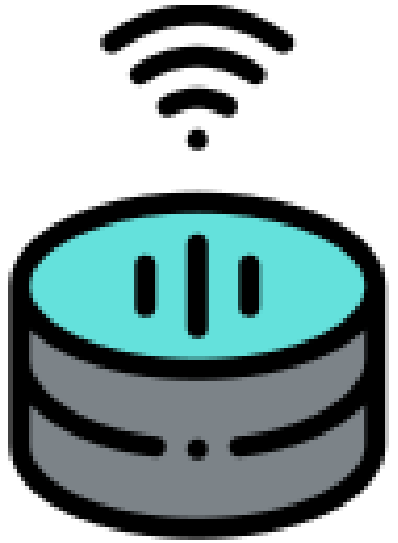


1st	2nd	3rd	4th
Mechanization, water power, steam power	Mass production, assembly line, electricity	Computer and automation	Cyber Physical Systems

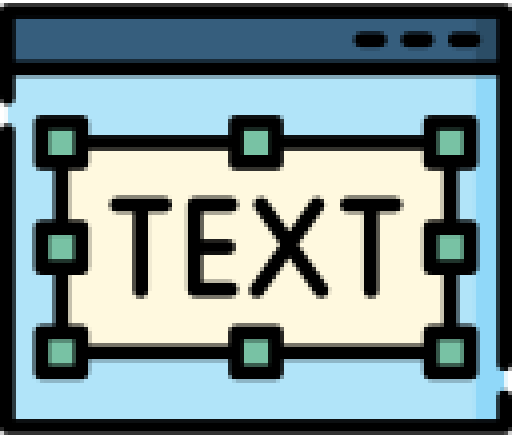

Technology capable of actions and behaviours *“requiring intelligence when done by humans”* (2018)

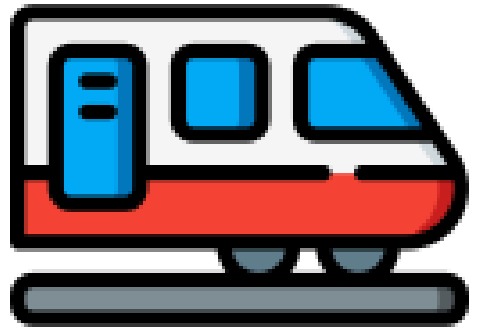

A Perfect Storm
Data, plus **very sophisticated** AI,
plus computing Power and Memory
NOAA





What AI are you already using?





How can data be used to improve learning?

Data is the ‘new oil’, and is the power behind AI

BUT it is UNREFINED

DATA can also be the power behind Human Intelligence

BUT it is UNREFINED

What are the implications of AI for Educators?

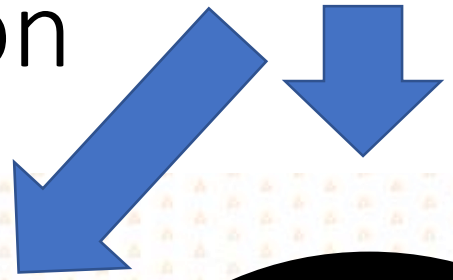
AI and Education

1. Using AI in Education to tackle some of the big educational challenges

2. Educating People about AI so that they can use it safely and effectively

3. Changing Education so that we focus on human intelligence and prepare people for an AI world

AI and Education



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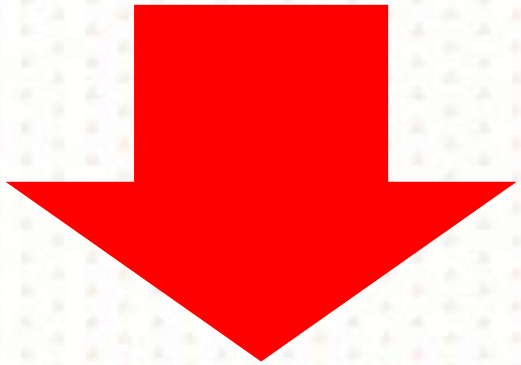
AI and Education



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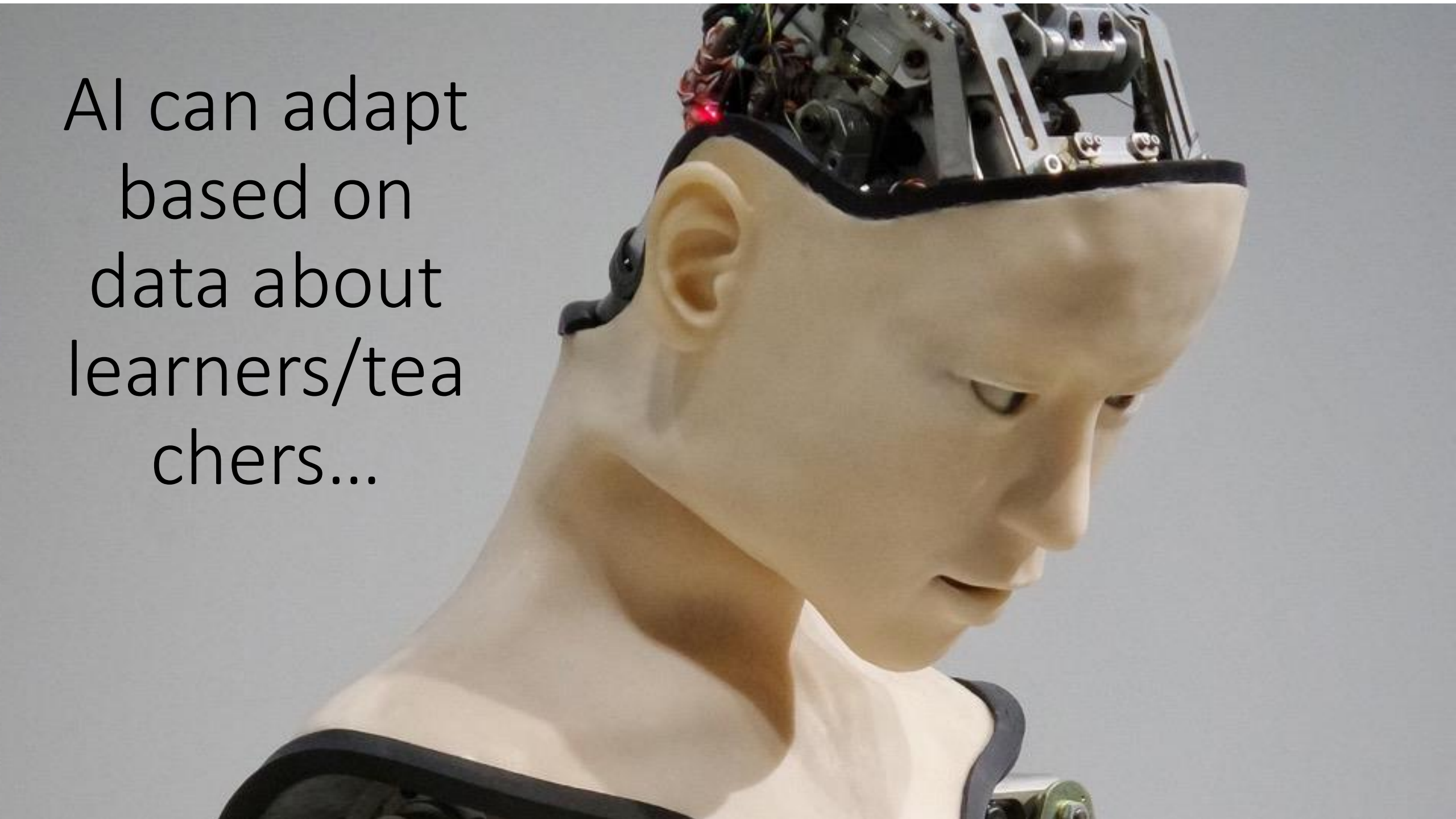
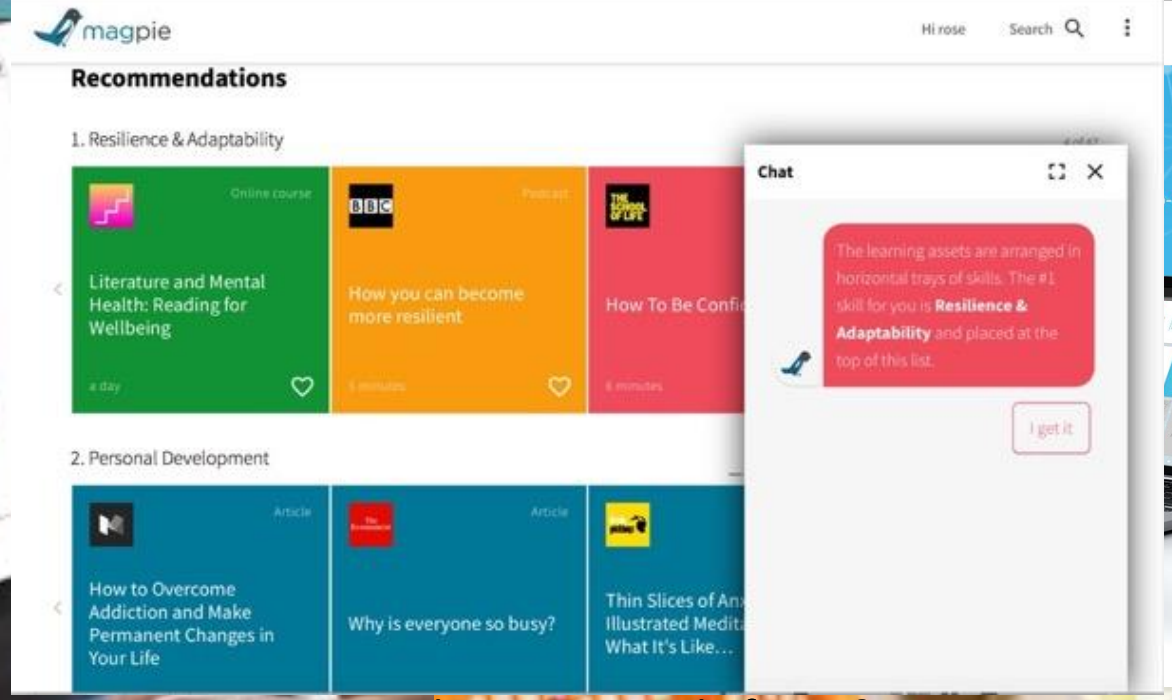
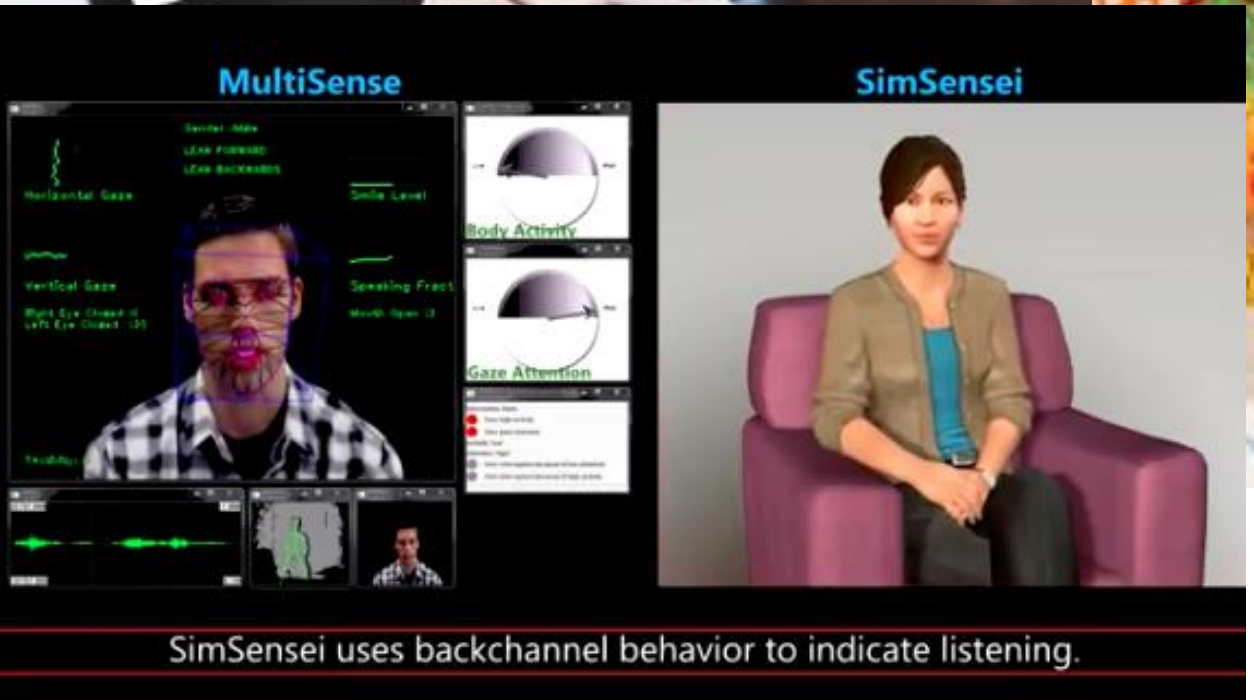
What are the implications of AI for Educators?

AI can adapt based on data about learners/teachers…





Is Education Ready for AI?



CENTURY
INTELLIGENT LEARNING

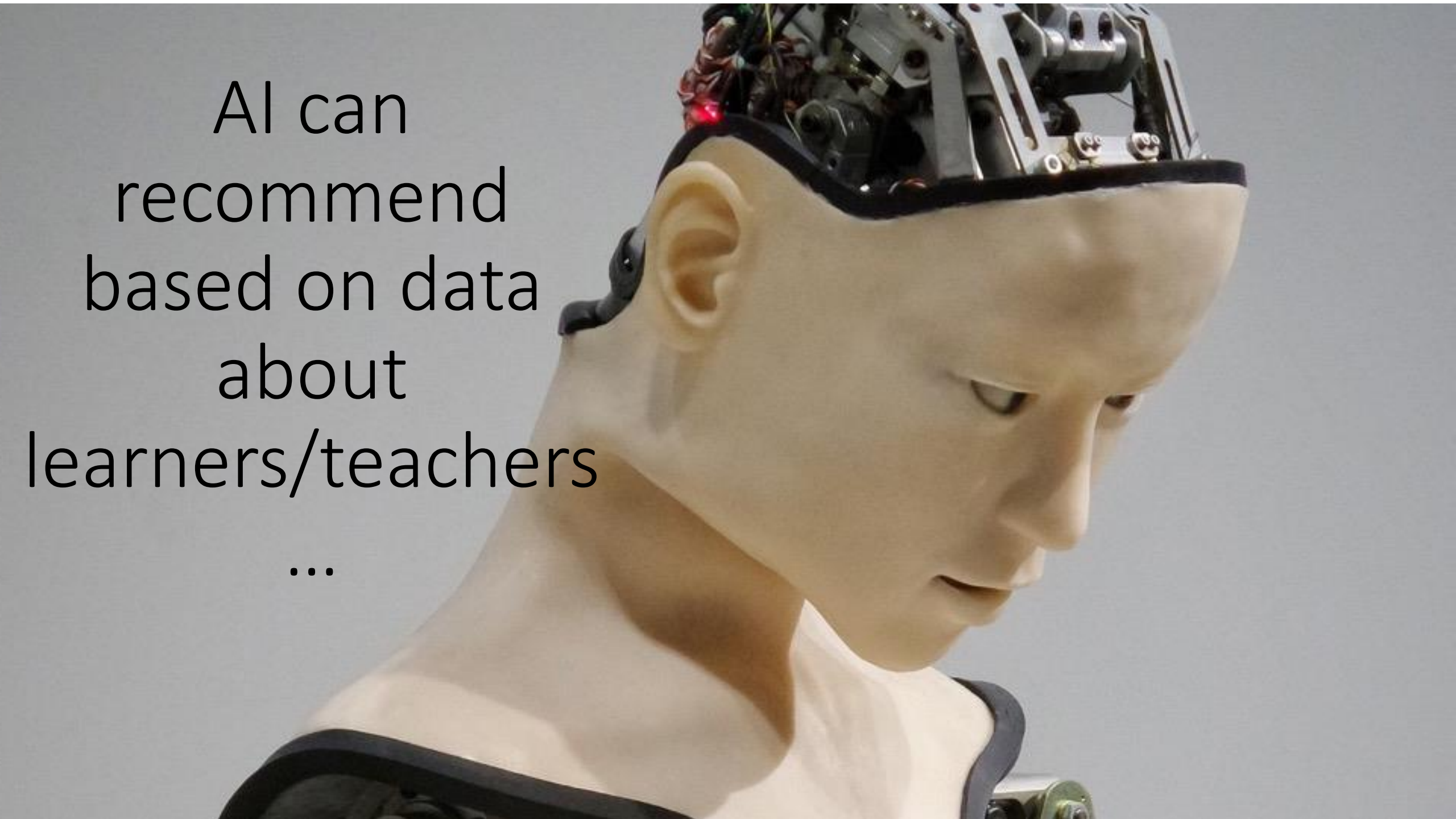
EDUCATE
Startx
SOSV
Johnson & Johnson

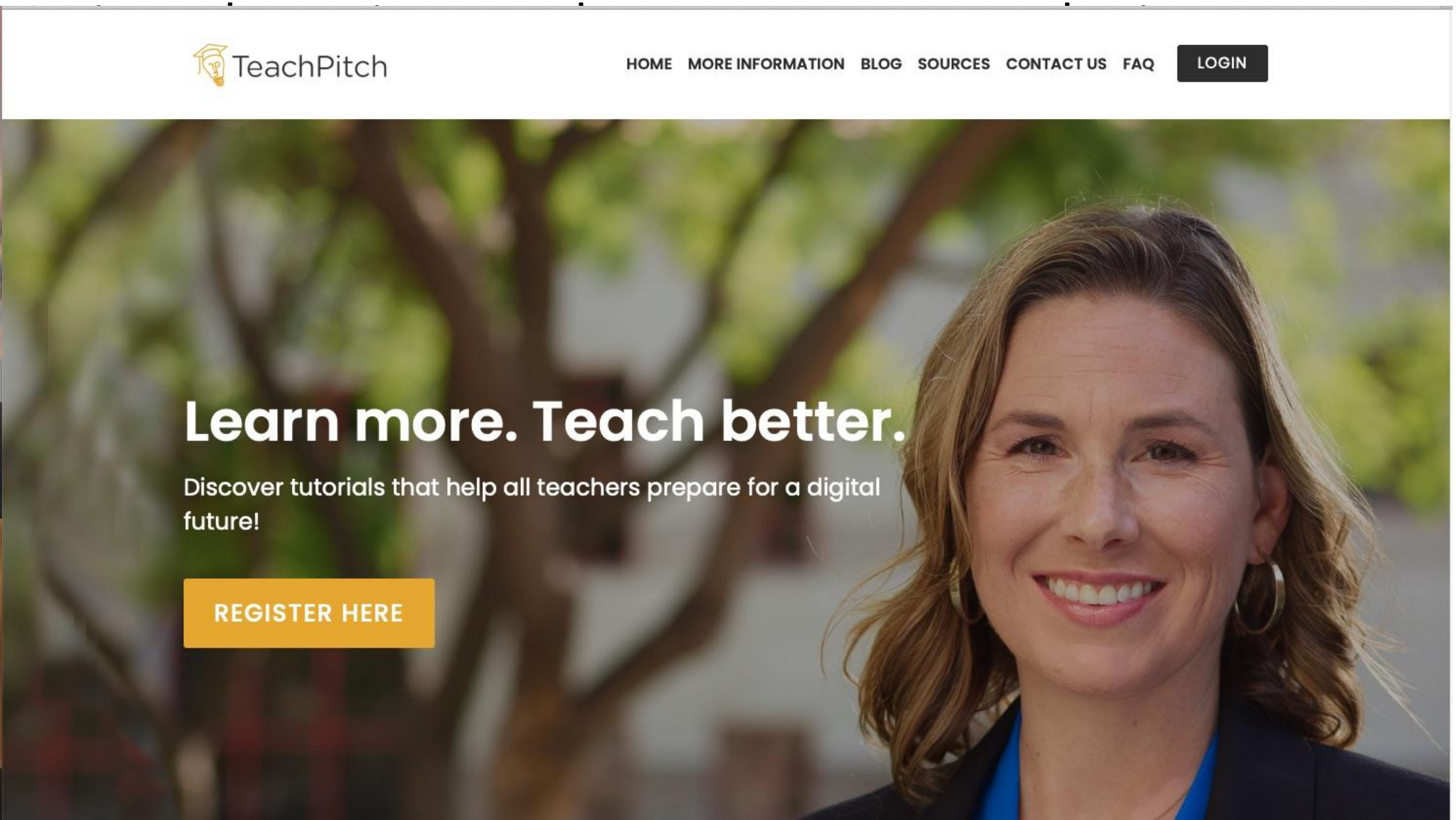
AI in Education Today: Adaptation

MATHiaU™

The 1-to-1 math coach college students can count on.

CENTURY
INTELLIGENT LEARNING™


AI can
recommend
based on data
about
learners/teachers
…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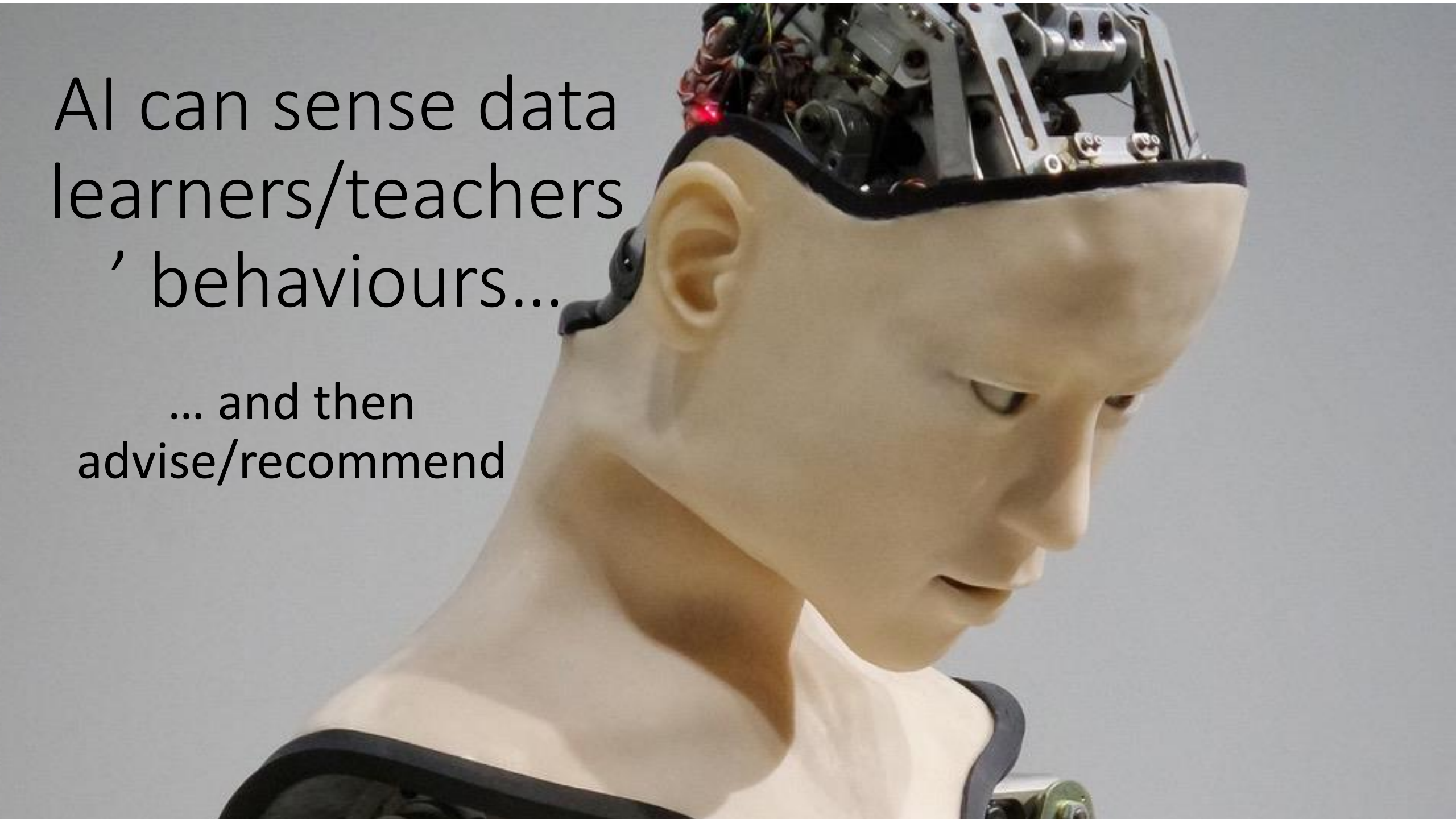

AI can sense data learners/teachers ’ behaviours…
… and then advise/recommend

AI in Education Today: Early years

oyalabs

Science-based A.I. platform that monitors child's language and cognitive development and guides parents through a personalised and home-based curriculum

Working with:

Goldsmiths
UNIVERSITY OF LONDON

香港科技大學
THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

THE UNIVERSITY OF SYDNEY

AI in Education Today: Early years

Evidence-based A.I. platform that monitors child's language and cognitive development and guides parents through a personalised and home-based curriculum

oyalabs

AI/NLP MONITOR:

We monitor the quantity and quality of early parent-child talk

VISUAL PROGRESS

SHAREABLE REPORTS

GAMIFICATION

PERSONALISED:

Activity ideas
Book & Toy Bundles
Expert consultations

01 MONITOR — **02** ANALYSE — **03** IMPROVE →

Shaping positive parenting habits

AI can sense and adapt

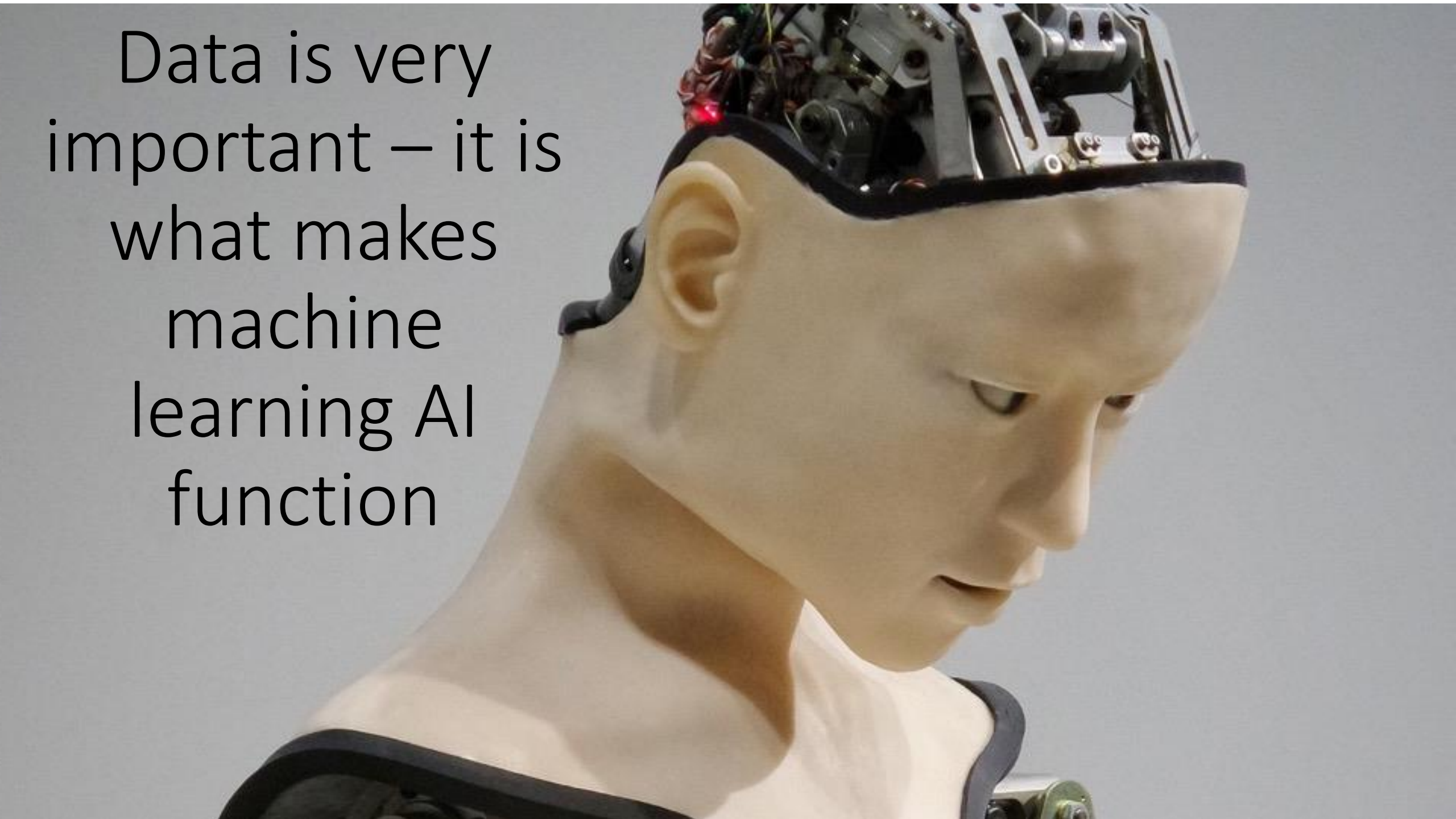
based on multiple sources of data about learners/teachers…

MultiSense

SimSensei

SimSensei uses backchannel behavior to indicate listening.

Data is very important – it is what makes machine learning AI function



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And all these steps should be done ETHICAIly

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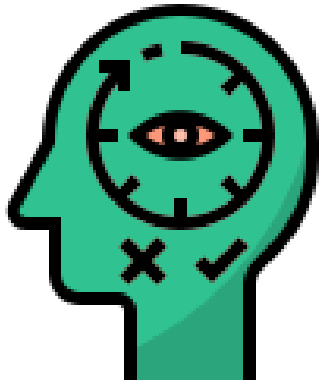
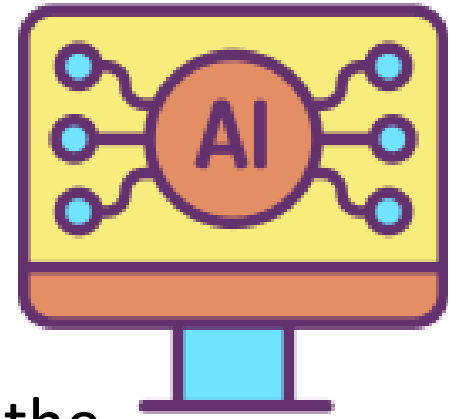
Important points to note

- This is simplified



  - It is vital to make all existing assumptions explicit, question them and check that they are correct



- This is about how AI could help us understand our challenges?
- ONLY THEN we can properly assess how AI could help us tackle the challenge

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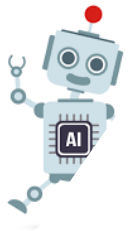
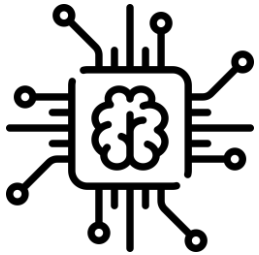
3. Social intelligence

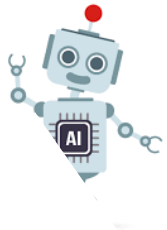


4. Meta-cognitive intelligence

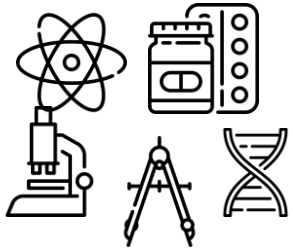


5. Meta-subjective intelligence

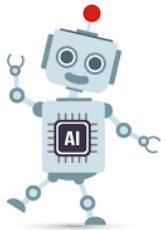
2. Meta-knowing intelligence

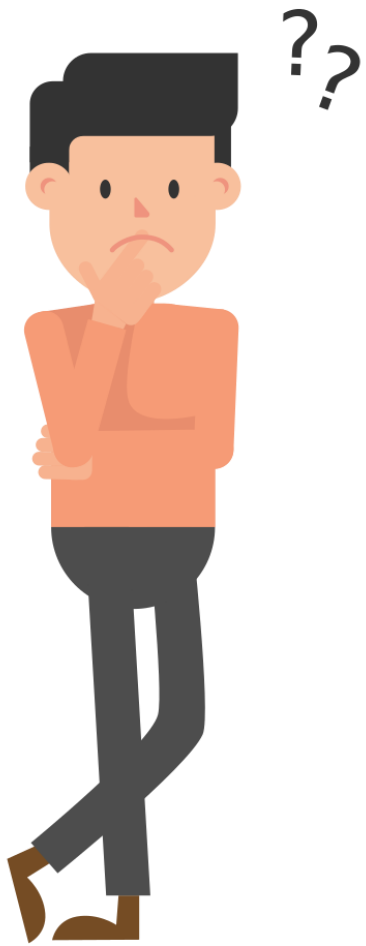


6. Meta-contextual intelligence

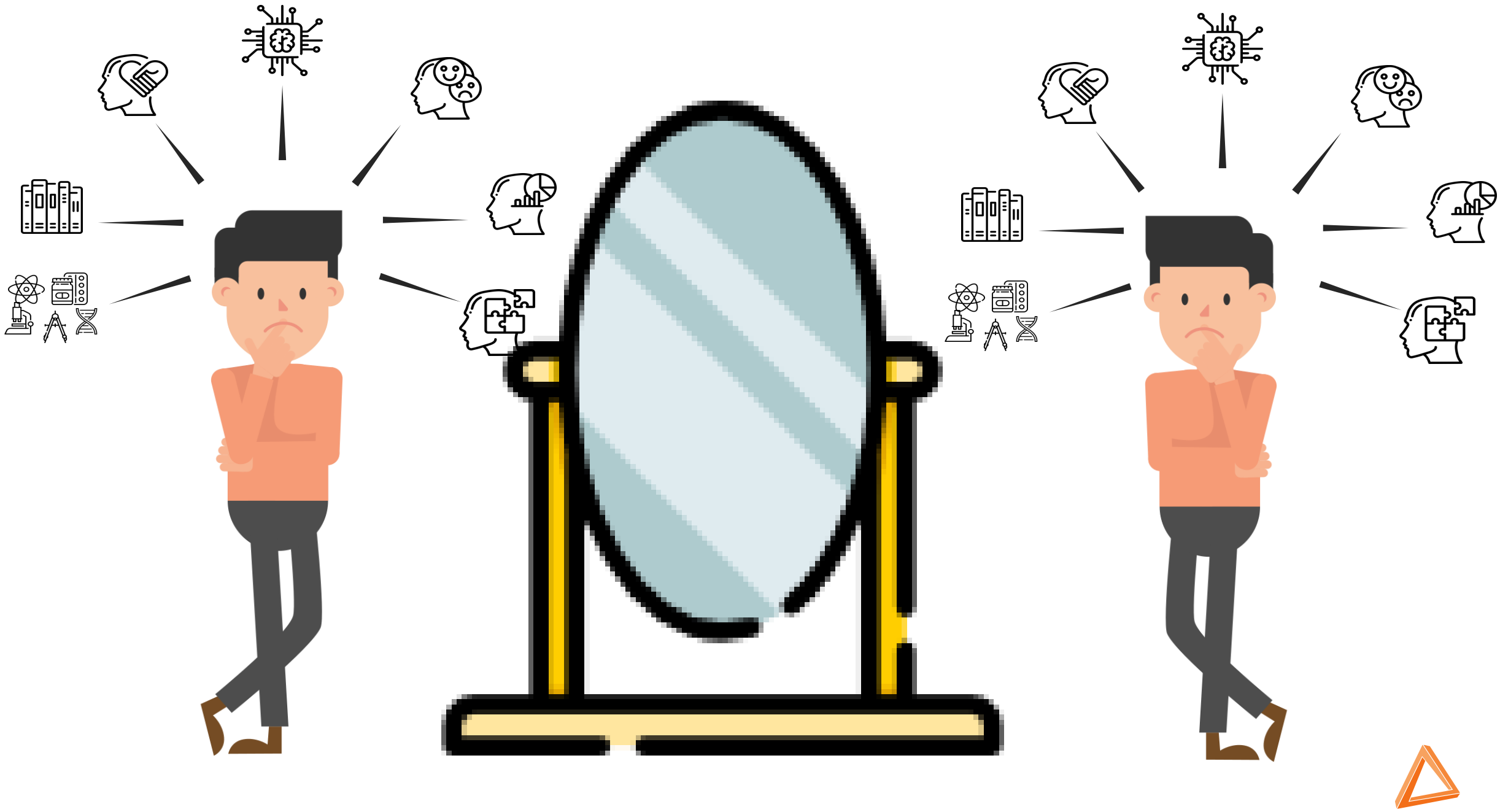


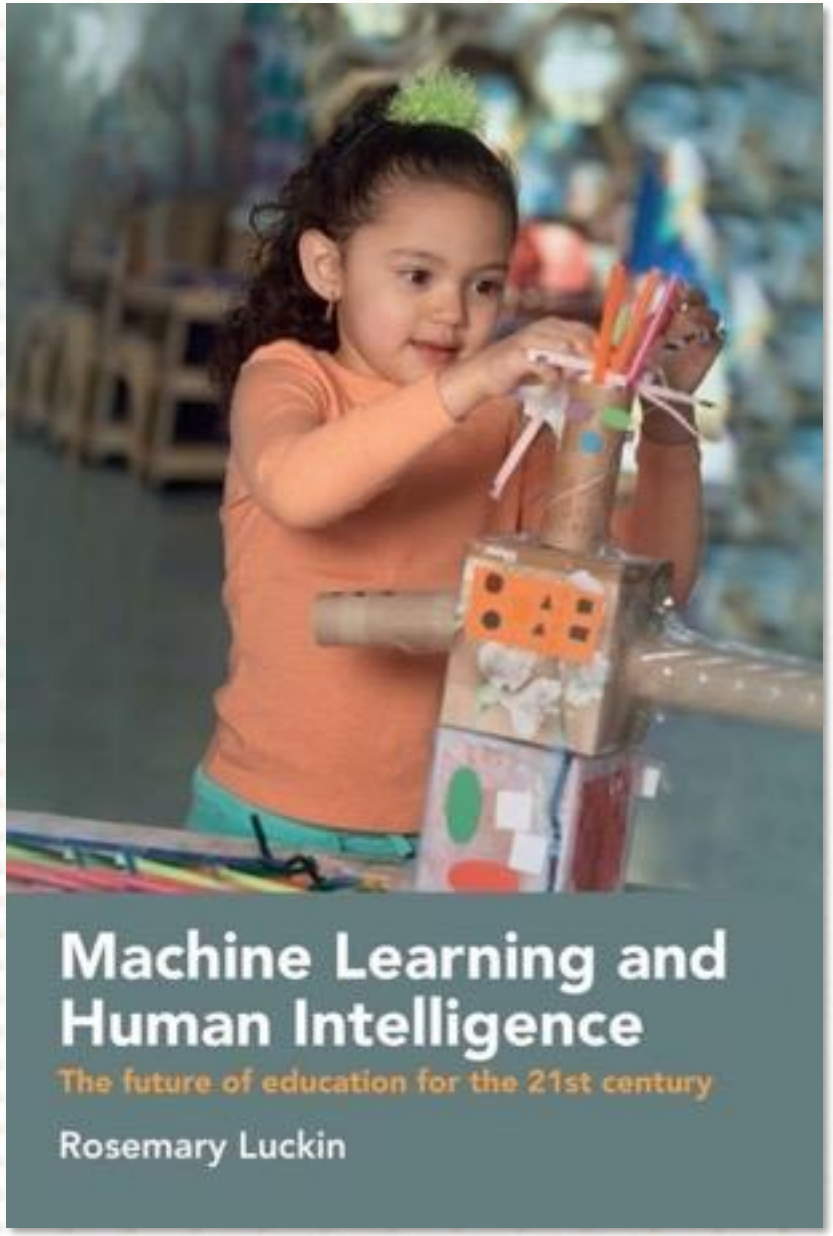
1. Interdisciplinary Academic intelligence





7. Perceived self-efficacy




Machine Learning and Human Intelligence
The future of education for the 21st century
Rosemary Luckin

Criteria – 10 steps	
AI compatible?	✔
Do we already know enough to get started?	probably
Can we know more, even if we don't now?	✔
How controllable is the context and by whom?	not very
What level of uncertainty is there?	lots
How much data do we already have?	some
Can we collect more data if needed?	yes
How accurate can we be?	?
Does the institution have the appetite to change, what is their reputation for innovation (what is their risk appetite)?	??
How important is solving this challenge for the institution?	crucial

When teaching was delivered online for many students and then hybrid with some students in school and others at home –what happened to continuity and quality?

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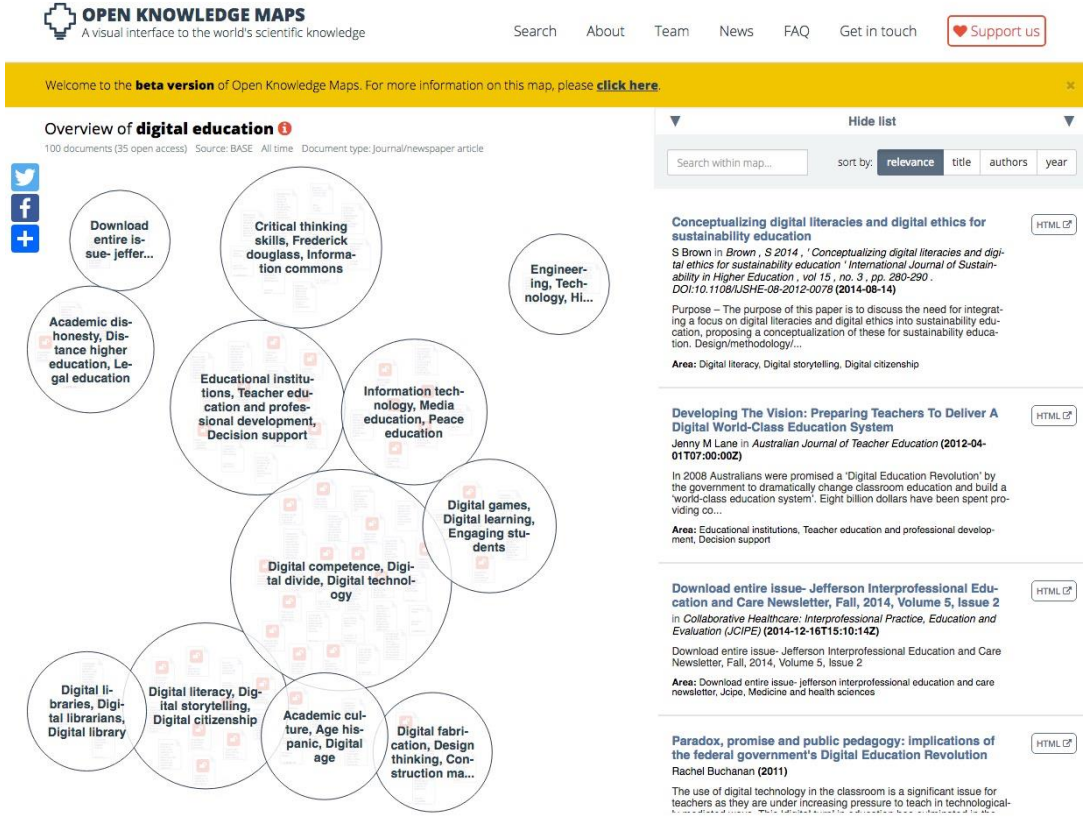
What can data offer for ensuring the quality of teaching and learning?

What data do I need?

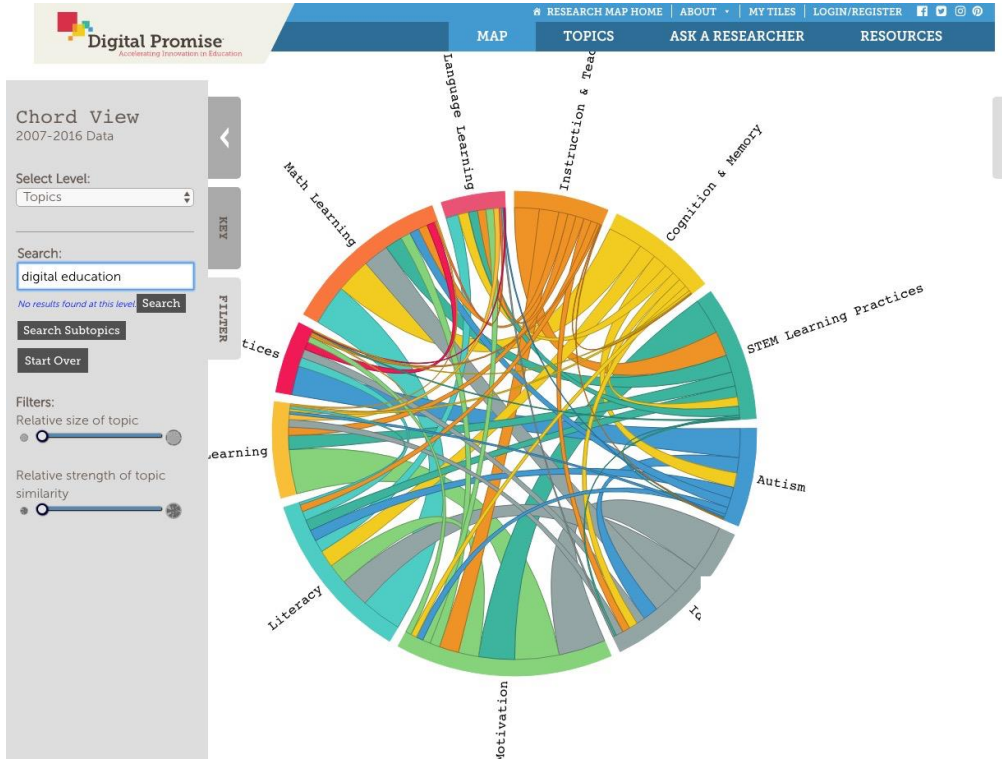
What data the research says I should collect?

Data that other people have already collected and analysed as well

- Open knowledge maps
- https://openknowledgemaps.org/



- Digital promise research map
- http://researchmap.digitalpromise.org/



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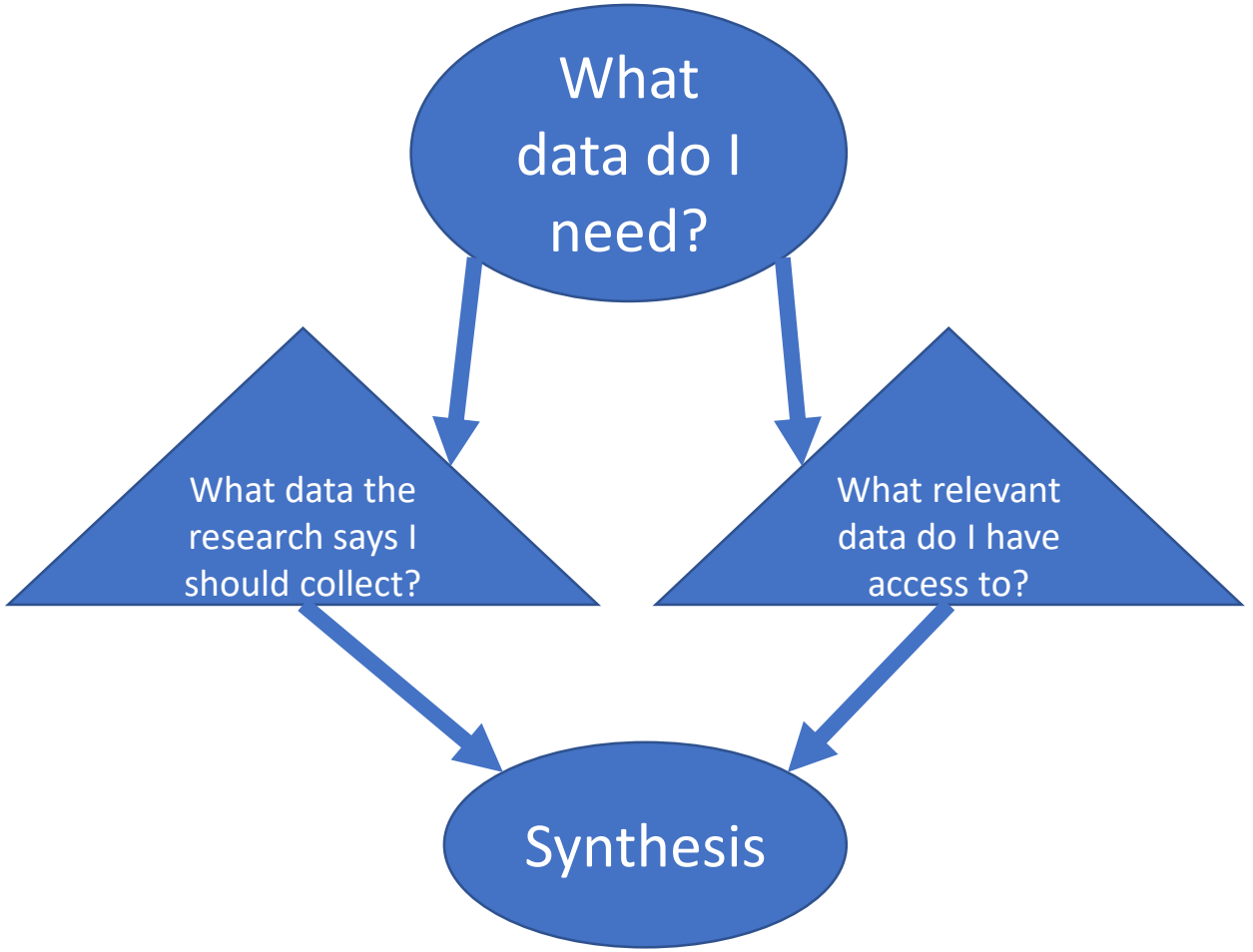
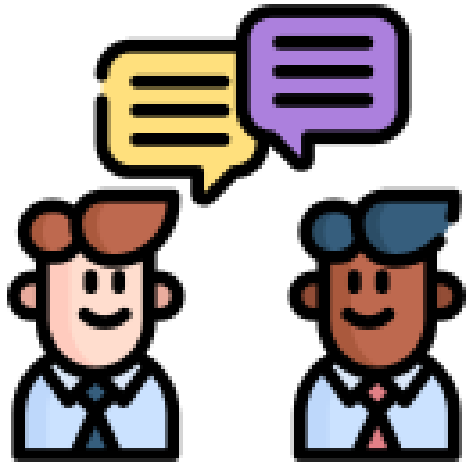


Where do we start?

Where might the data about an organization and the people who are part of. it be found?

Or we could ask:

What are the **data sources**?

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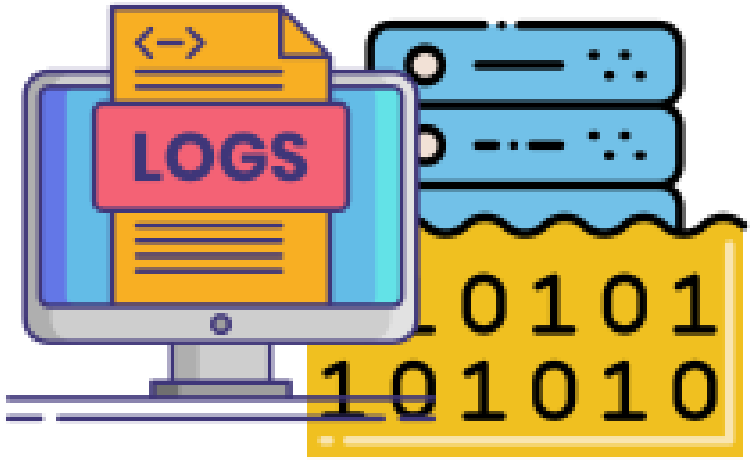
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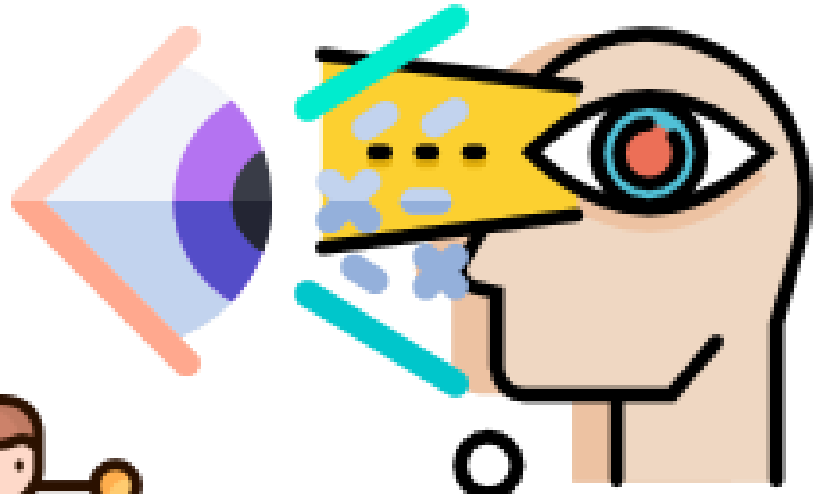
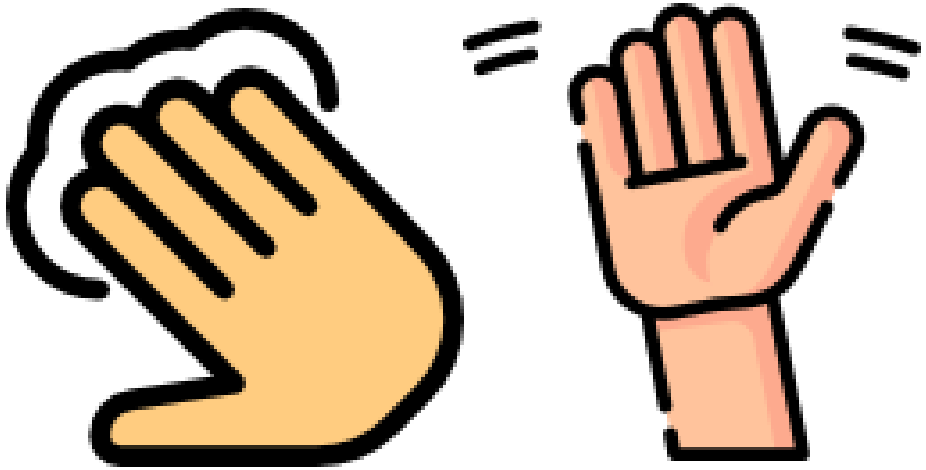
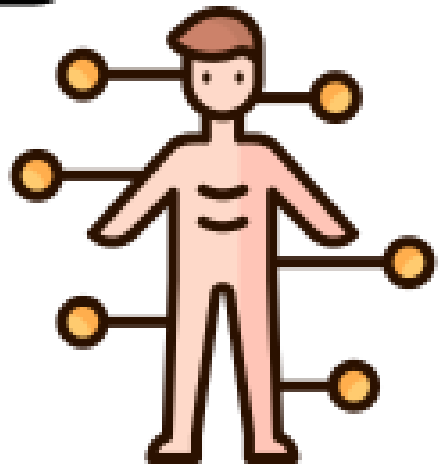
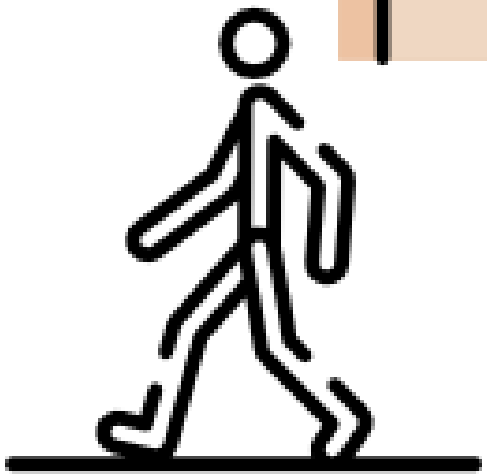
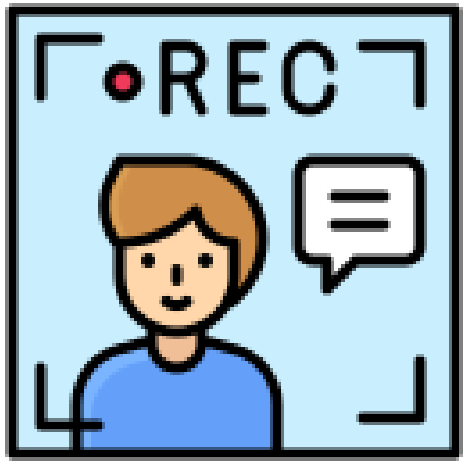


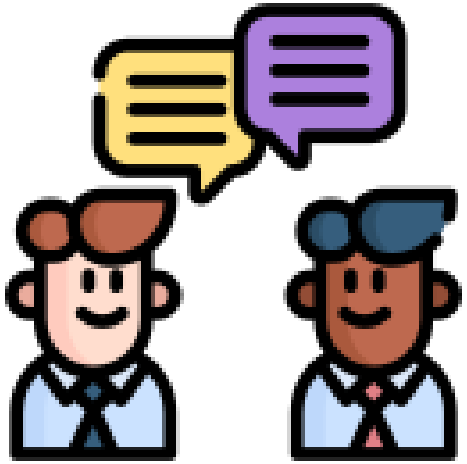






Example Data Sources





Log Data
from Interactions with technology, including and button clicks

Historical Data
From Tests, Interviews and Videos

Video data from which Eye-Movements can be detected

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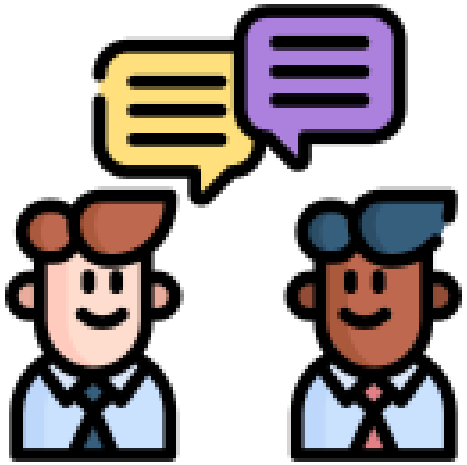
Let’s add some new data



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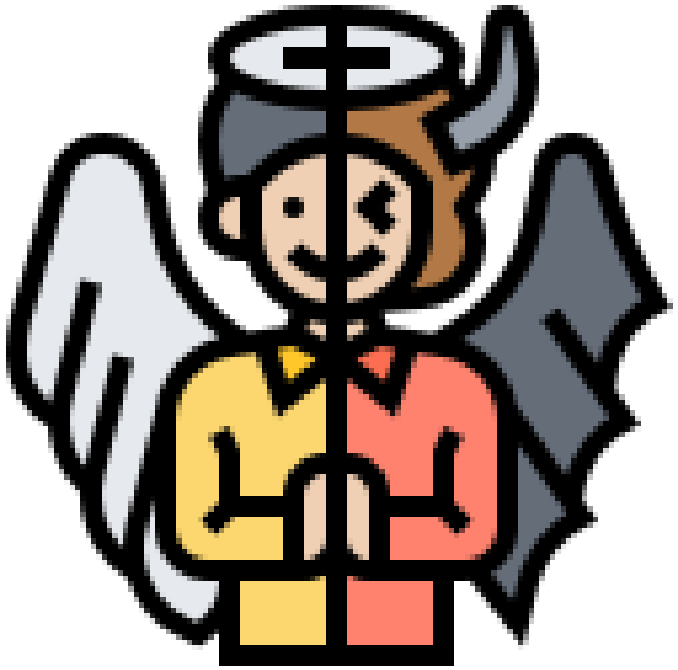
Video data from which Eye-Movements can be detected

Behavioral Data
From a survey

Remember the ETHICS



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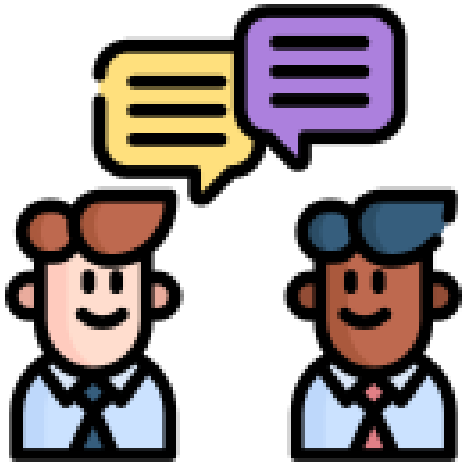
What are our ingredients – the data we have collated and collected?



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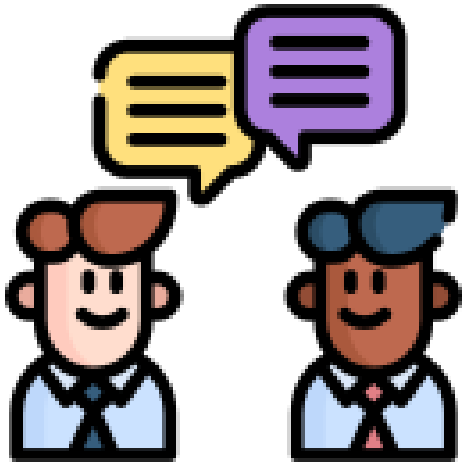
Behavioral Data
From a survey

What are our ingredients – the data we have collated and collected?



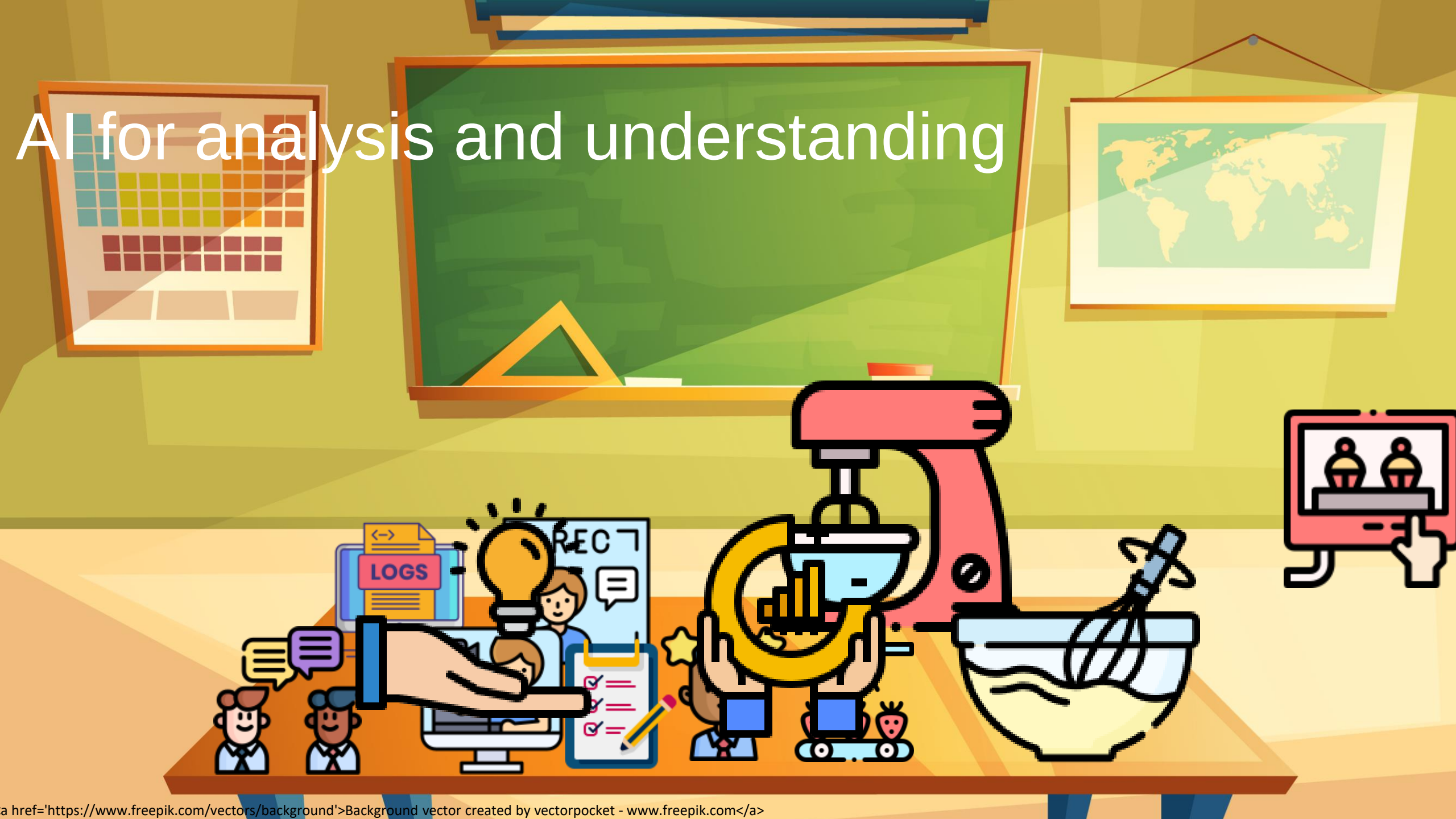
Log Data
from Interactions with technology, including and button clicks

Historical Data
From Tests, Interviews and Videos

Video data from which Eye-Movements can be detected

Behavioral Data
From a survey

AI for analysis and understanding



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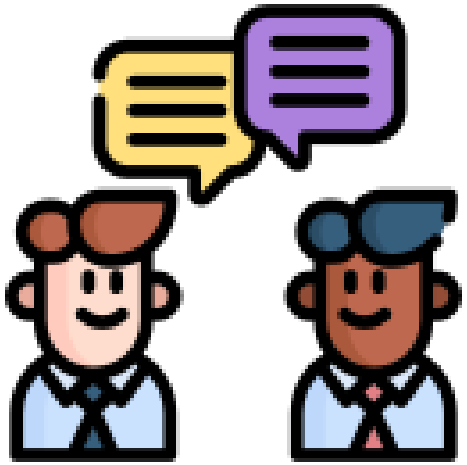

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Work Flow

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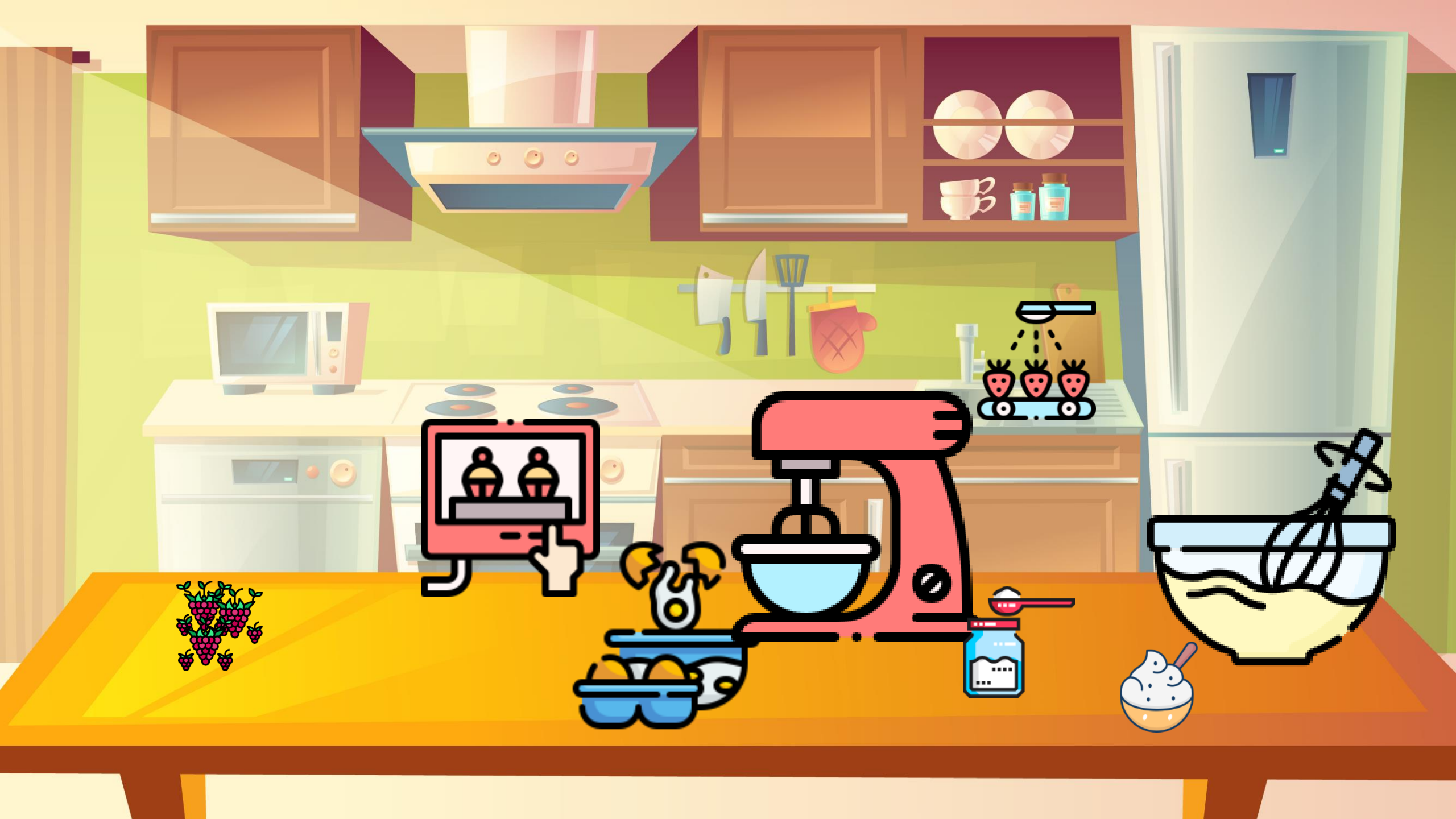

Work Flow

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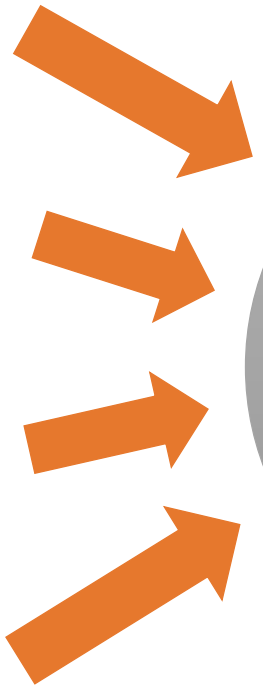


collated, cleaned, organized transformed data set

Work Flow

Behavioral Data
e.g. Questionnaires

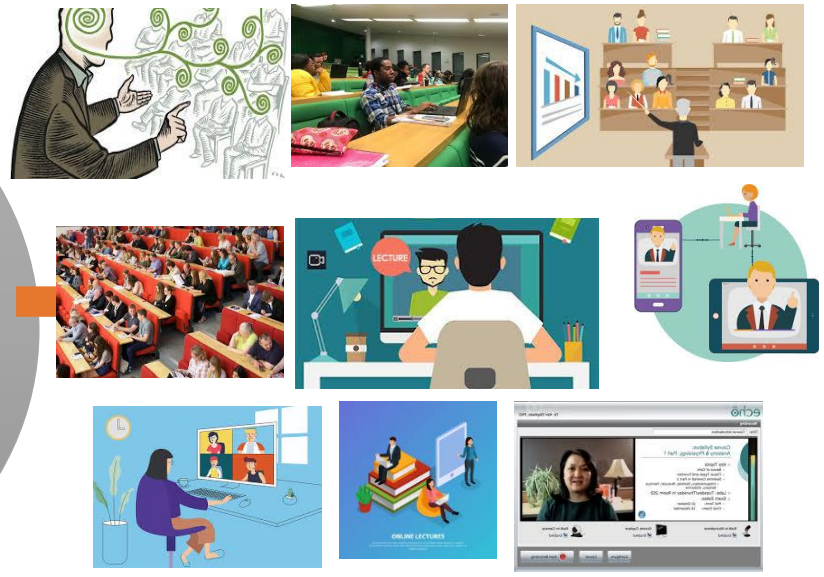
Historical Data
From Tests, Interviews and Videos

Log Data
from Interactions

Multimodal Data
From Eye-Movements and Button clicks

Modeling Using Machine Learning techniques to profile interactions and make predictions

Interaction Profiles

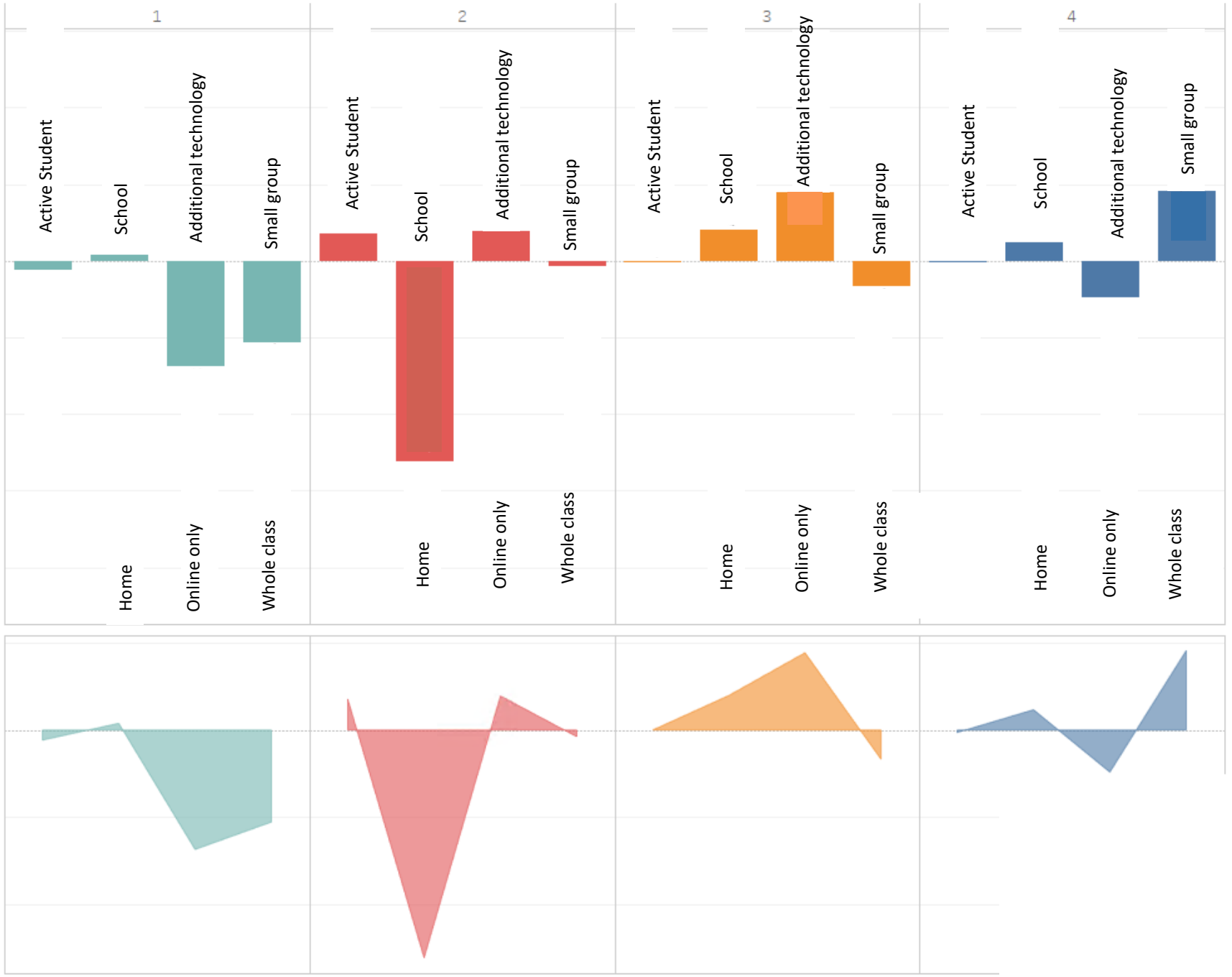


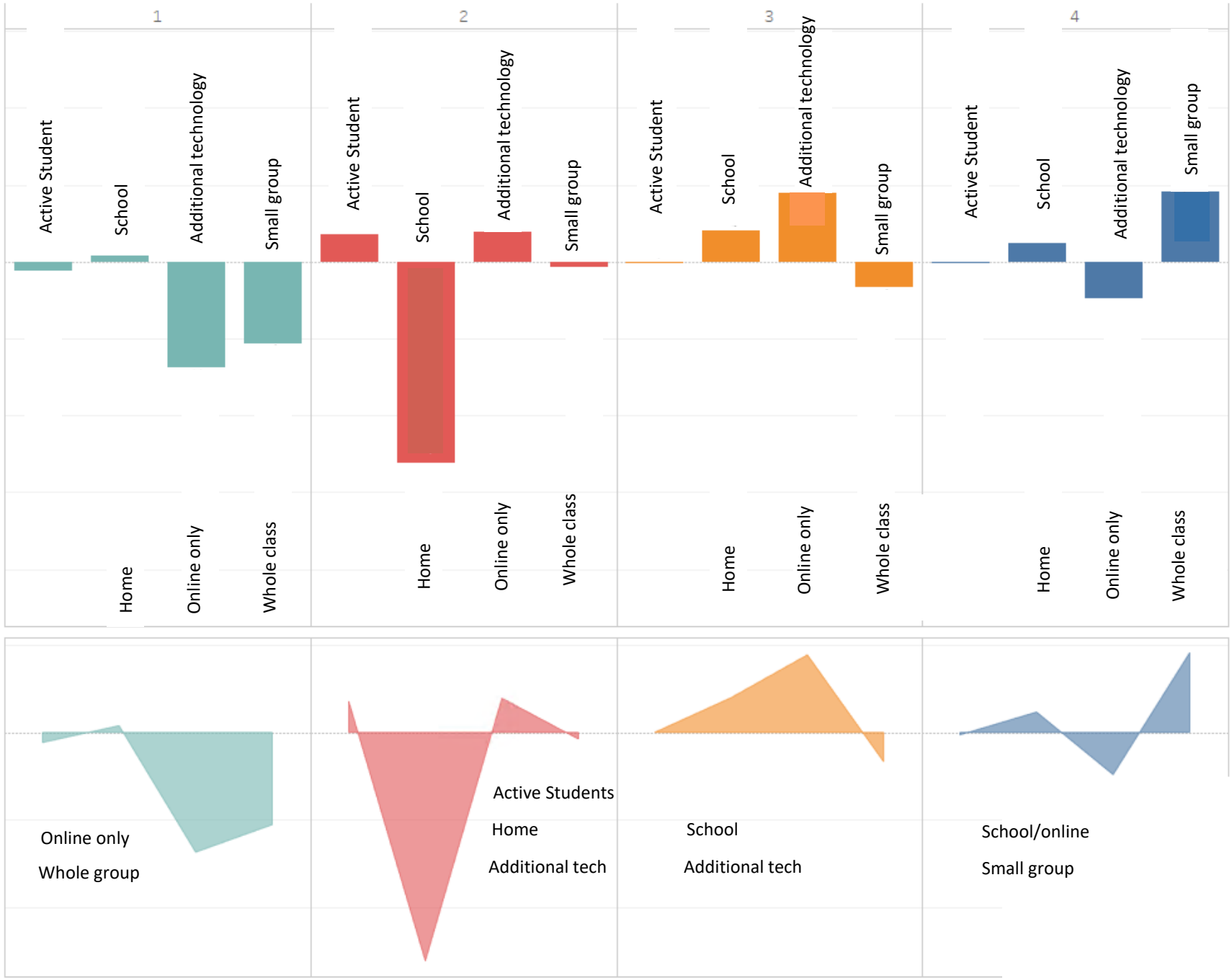
Natural Groupings enable Profiles

The groupings that cluster analysis can produce enable the identification of profiles.

In this example profiles of different sorts of educational interaction can be identified, for example it may show that one interaction profile has high values for small group sessions in science with high levels of activity by students when at home

Profiling four types of interaction, using four features





Profiling four types of interaction, using four features

1. The average amount of online activity by students as show in the log data;
2. The geographic location of the student: home or school;
3. The style of the interaction: whole class or small group collaboration;
4. The use of technology: just the online platform or online platform and additional technology;

The 7 steps to AI Readiness: ETHICAI

There are seven key steps to getting your organization ready to leverage the transformational power of AI. These can be found in the ‘ETHICAI AI Readiness’ framework:

1) **Educate, enthuse, excite** – about building within your community an AI mindset
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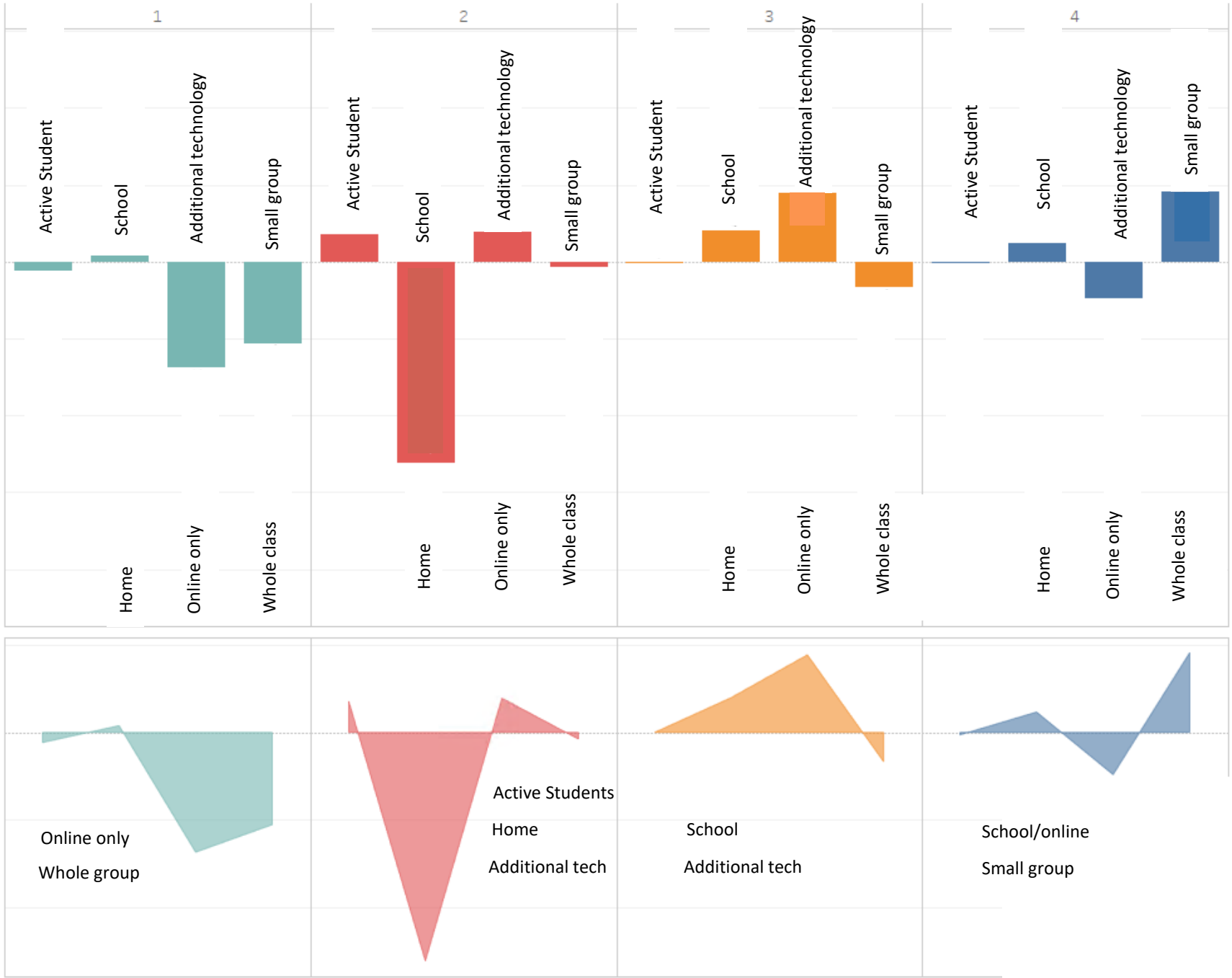
7) **iterate**

And all these steps should be done ETHICAIly



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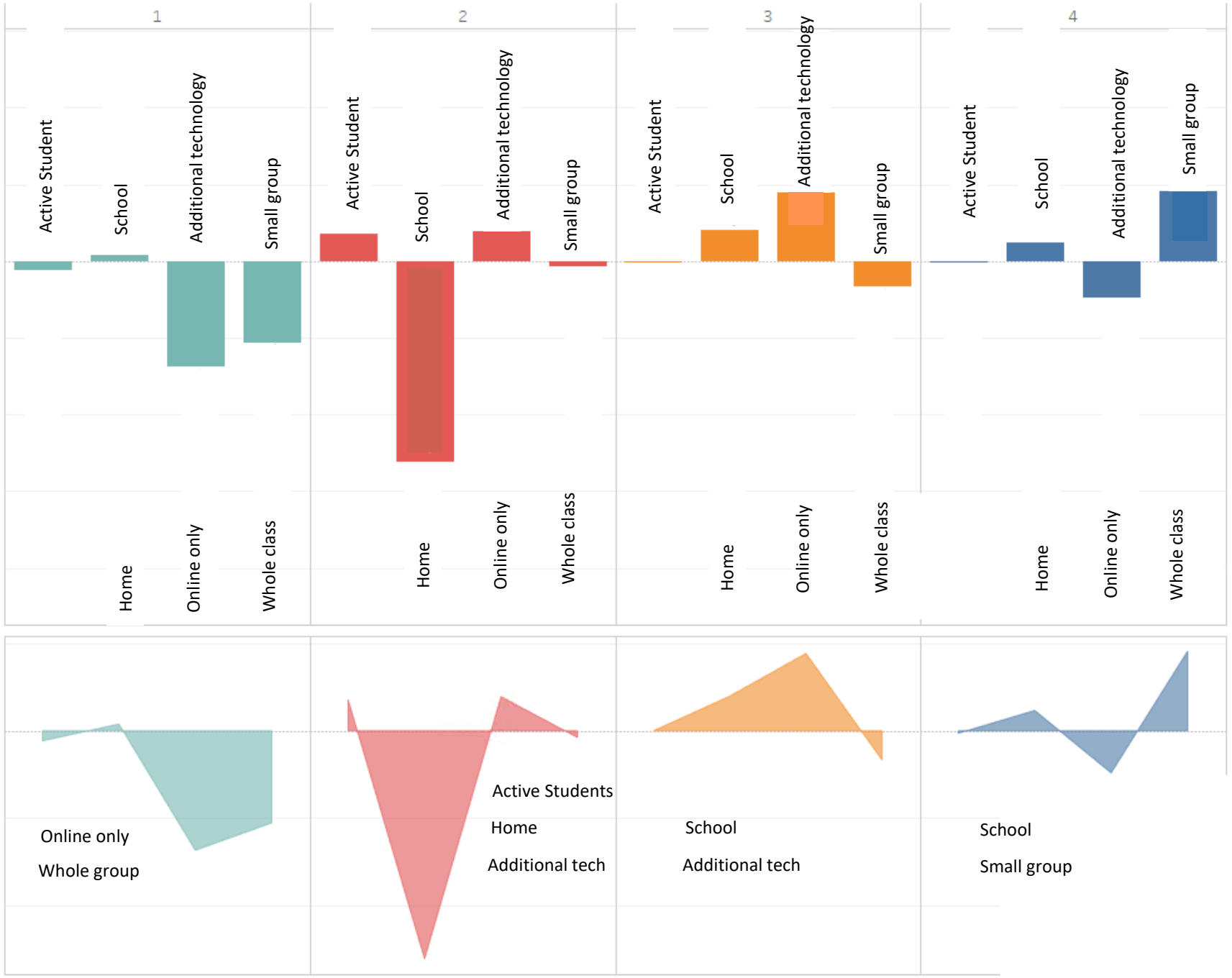
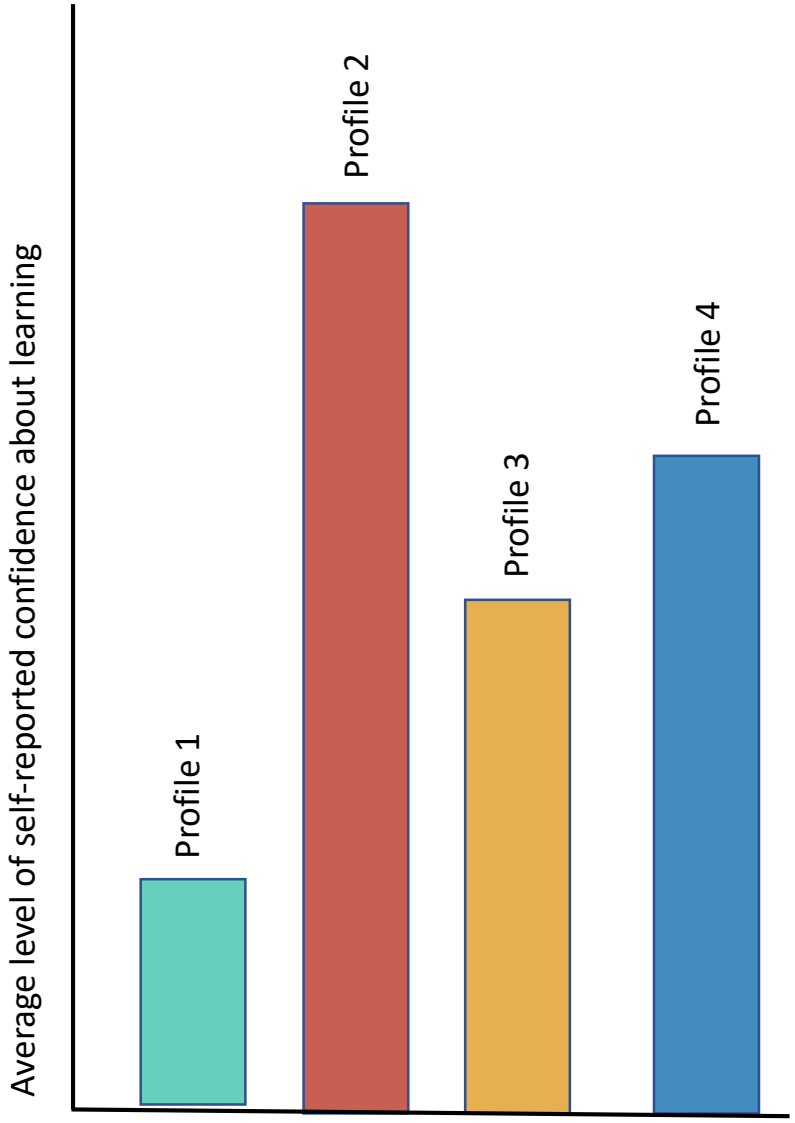
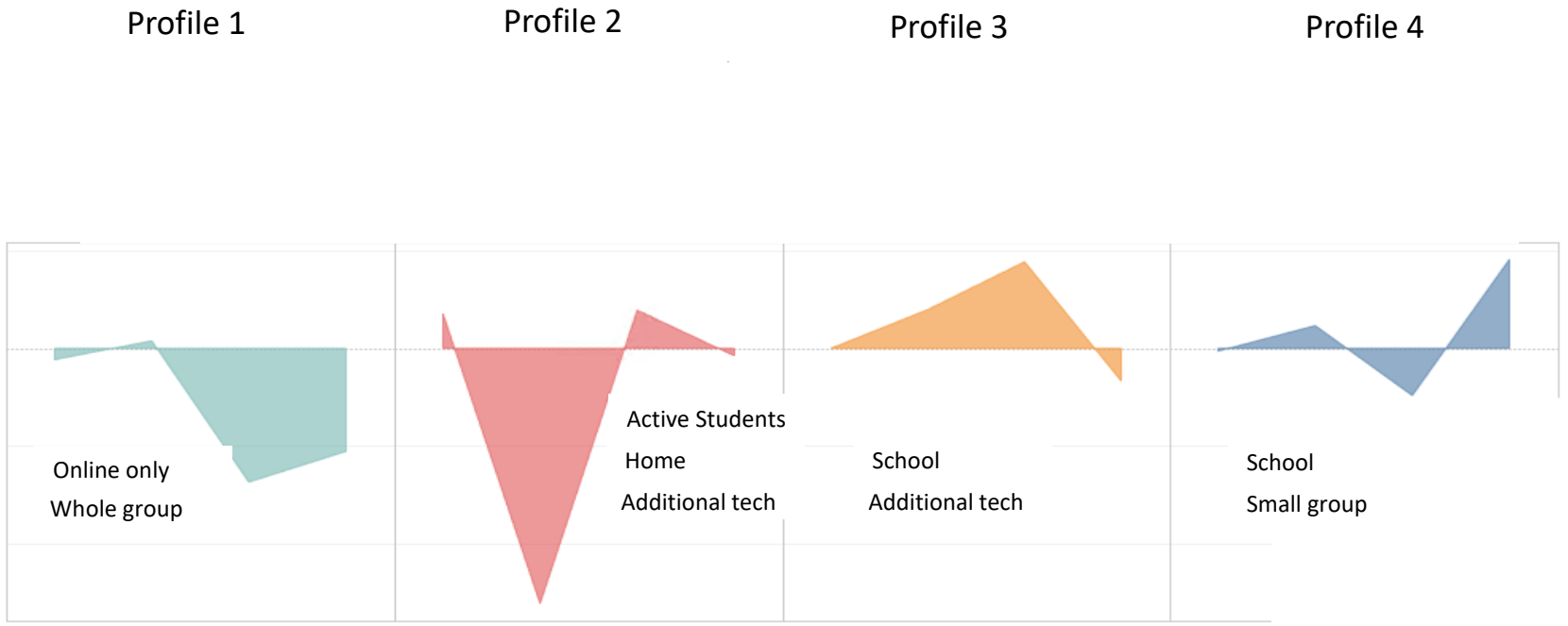


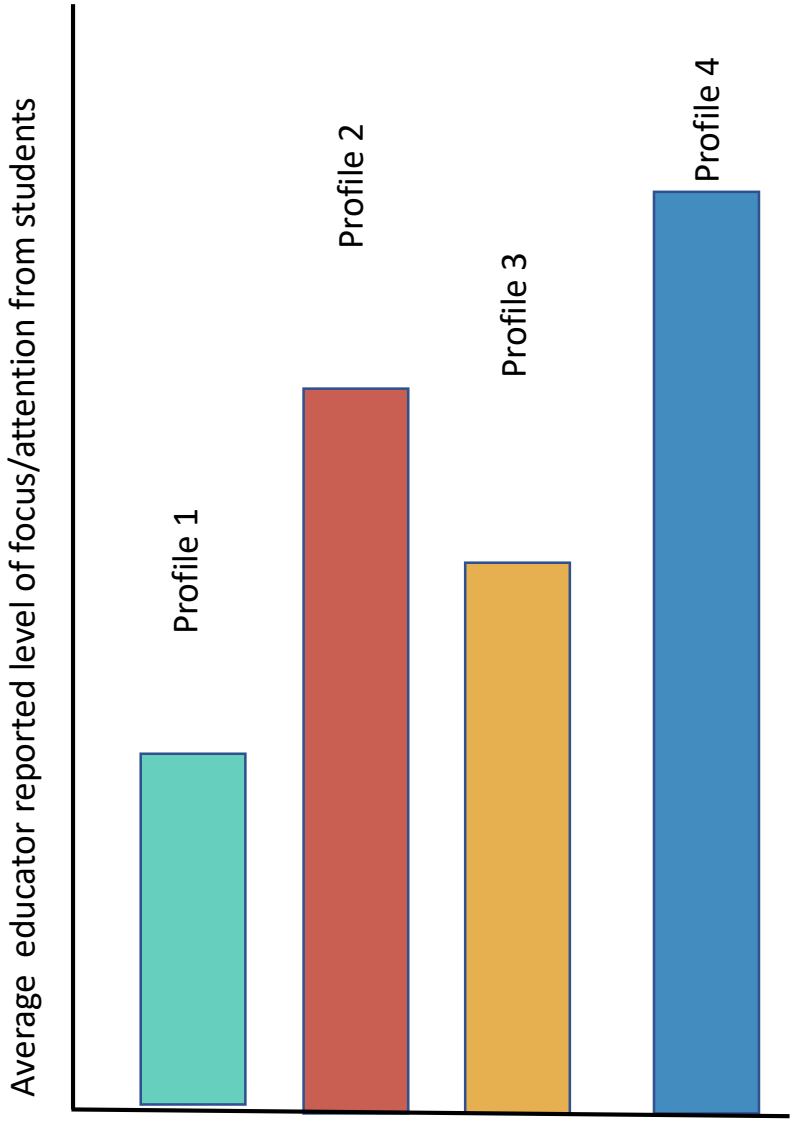
Could it be that the patterns that we clustered relate to other data that we have access to?

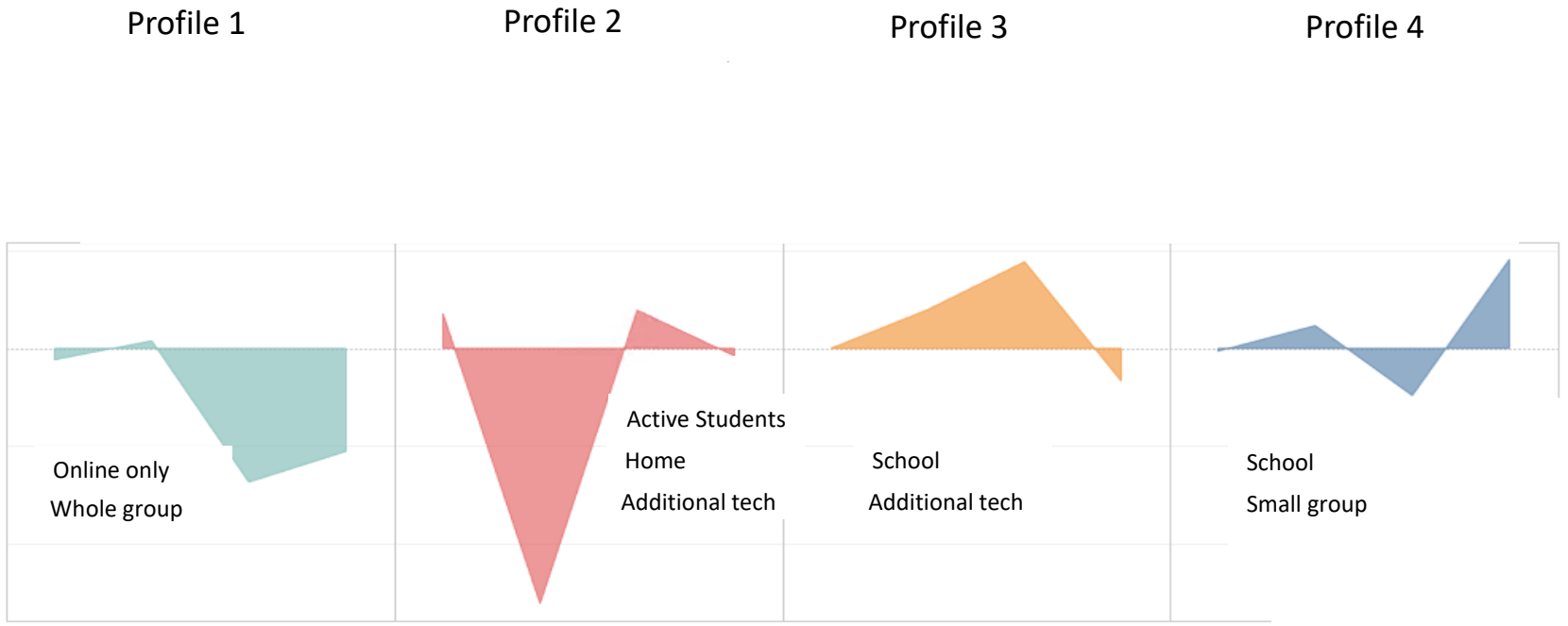
For example data from the survey about student confidence?





For example data from the survey about student focus and attention





But, remember this is just an example

These are the sorts of questions that AI can help you answer

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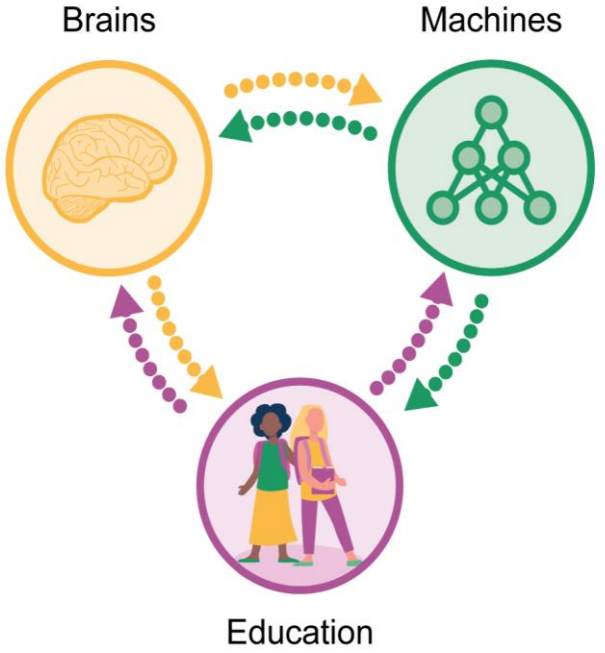
How might AI in education evolve?

What might happen if we connected more disciplines?

Could we catalyse a revolution in how we learn to transform education and training to meet the needs of a dynamic and challenging world.

How? By connecting our understanding of the neural and informational structures that support and influence learning in the brain to the way those structures shape and are shaped by learning in the world.

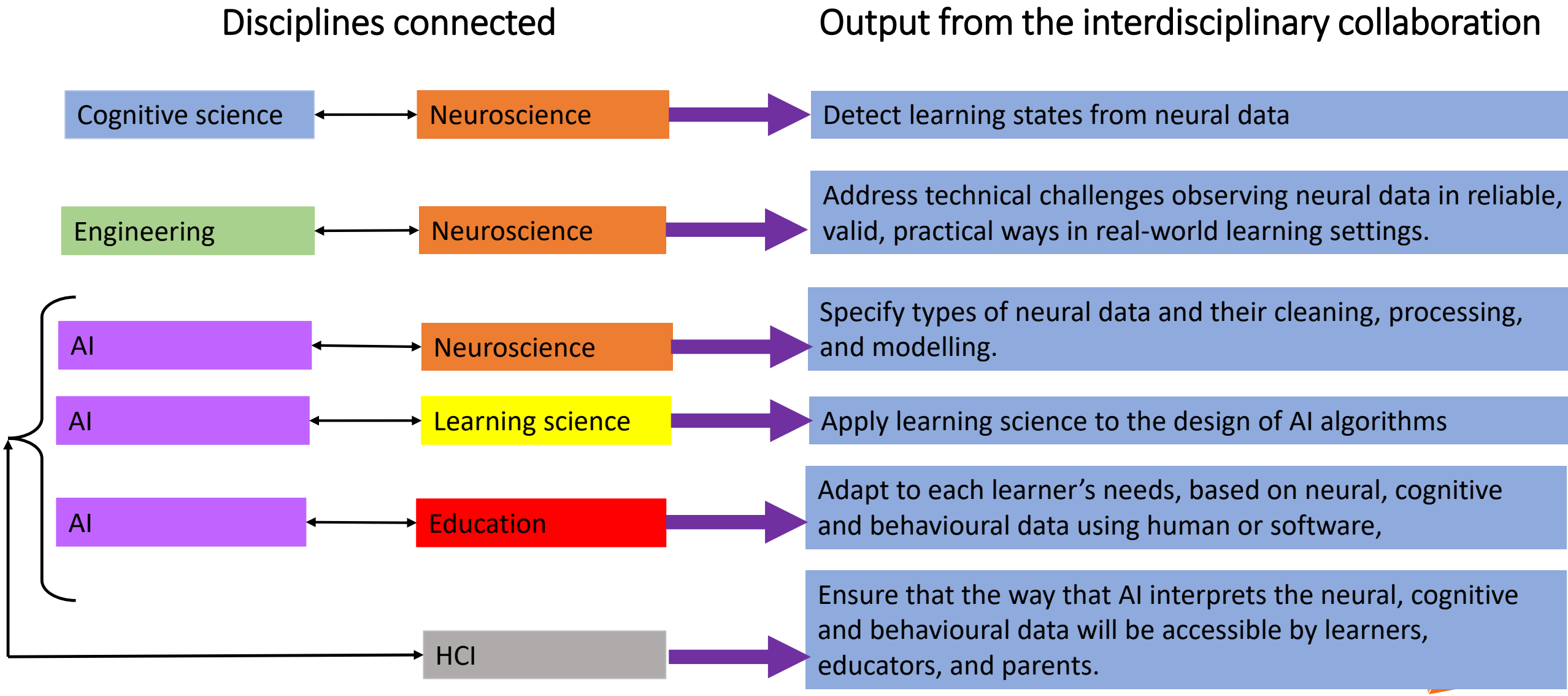
By answering this question: How can we connect learning as it occurs in the brain with how people learn with artificial and human others in the world?



Tools: software and wearable technology for real-time readout of brain state and behaviour to facilitate self-regulation and knowledge acquisition.

Capacity building: a community of scientists and educators who will realise the potential of our science ethically and equitably for the benefit of society.

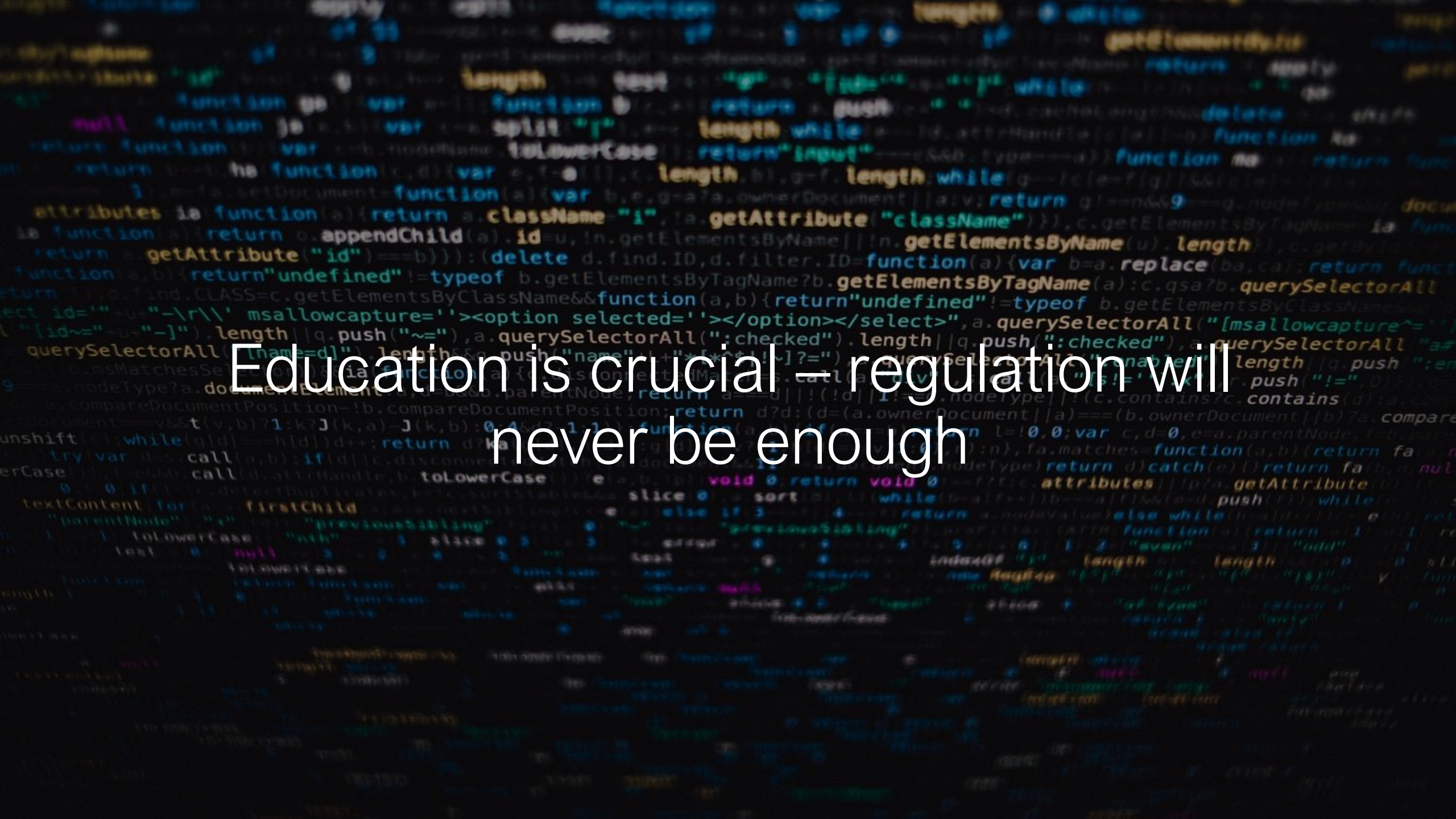
Connecting Disciplines




OVERVIEW
14:25
Class Engagement Summary
Ethan
Eli
Ethan
Eli
Ethan
Eli
Noah
July
Noah
July
Noah
July
July
Noah
July
Noah
July
Noah
Ethan
Tom
Ethan
Tom
Ethan
Tom
Engagement for the Last 5 Minutes
50%
35%
15%
Engagement History
A
Class Intervention


Tara and Ethan seem stuck...
Maria has been idle a while...
14 students combining unlike terms
9 students transformating one side only
Zzz...
B

http://instituteforethicalaiineducation.org


Education is crucial – regulation will never be enough

References and Resources

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AI Readiness
Downloadable videos can be found her:
https://www.educateventures.com/webinars

Discussion Prompts

- What are the greatest challenges for educators when it comes to understanding what AI is capable of achieving?
- How best could the data that is held in schools be leveraged to support school development?
- Which of the challenges that educators and learners face do you believe to be the most important and suitable for the application of AI?
- How best can the education ecosystem be encourage to work together to understand the best role for AI to play?