Is education Al-ready?

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Visit slido.com and use the event code #6271 or use the QR code --->.
Education in a Pandemic – how can AI help?
2019

Merry Christmas
A Perfect Storm

Data, plus very sophisticated AI, plus computing Power and Memory
What is bringing about change in Education?

1.0
1st revolution
Mechanization, steam and water power

2.0
2nd revolution
Mass production and electricity

3.0
3rd revolution
Electronic and IT systems, automation

4.0
4th revolution
Cyber physical systems
The OECD Learning Compass 2030 defines the knowledge, skills, attitudes and values that learners need to fulfil their potential and contribute to the well-being of their communities and the planet.

FIND OUT MORE:

- watch the video below for an introduction to the Learning Compass
- OR
- discover more about the individual concepts in the Learning Compass by clicking on the labels in the image.

>> Access all concept notes and in briefs

Merry March
2020
Unforeseen Challenge – COVID-19
POLL
How useful do you feel technology enabled remote education has been during lockdown?

* Very useful
* Useful
* Not Useful
* Worse than not useful!
AI and Education

Use AI in Education to tackle some of the big educational challenges

What sorts of AI is best suited to teaching and learning, in particular in emergencies like a pandemic?
AI in Education Today: Adaptation
MATHiaU™

The 1-to-1 math coach college students can count on.
AI in Education Today: Recommendations

https://filtered.com/
Conversational interface (chatbot)

magpie starts with a conversation. This is refreshingly engaging for the busy modern worker.

The chatbot introduces itself, provides some information on how best to use the system and asks some basic role-related questions.

That's all we need to make initial recommendations. Or learners can chat some more, reveal more and get more precise suggestions.

https://filtered.com/
Algorithms automatically increase the number of training loops for the domains where you have the greatest need…

If attention is your greatest need you will receive more Attention loops → building resilience in Attention. As you progress the loops become more challenging.
SimSensei uses backchannel behavior to indicate listening.
AI in Education Today: Early years

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.

AI/NLP MONITOR:
We monitor the quantity and quality of early parent-child talk.

01 MONITOR 02 ANALYSE 03 IMPROVE

Shaping positive parenting habits

PERSONALISED:
Activity ideas
Book & Toy Bundles
Expert consultations

VISUAL PROGRESS
SHAREABLE REPORTS
GAMIFICATION
AI in Education Today: A tutor for everyone

• One to one tuition is very effective.
• A single pupil, 30 minutes tuition, five times a week, for 12 weeks costs approximately £700 per pupil.
• Only few privileged students can afford it.
We collect data from real time 1 to 1 teaching sessions and are developing AI methods to automate their evaluation. This dramatically changes scalability, improves efficacy and ensures quality. Not to replace but to empower the online tutors To ensure quality at a scale (ultimately for all subjects across ages) To provide equal opportunities to disadvantaged communities
POLL
How aware are you about AI being used in education during Lockdown?
* Very Aware
* Somewhat Aware
* Not aware
* Not at all Aware
Education in (and out of) a Pandemic – how could AI help?
Unlocking the richness of **Human** Intelligence

The Potential
What is Intelligence?

1. The ability to acquire and apply knowledge and skills
2. A quickness of mental comprehension (or mental agility)
3. Knowledge
4. Wisdom
5. The ability to speak and write in Latin, Greek and Hebrew
How can we recognize Intelligence?

1. “The true sign of intelligence is not knowledge but imagination”;
2. “I know that I am intelligent, because I know that I know nothing”;
3. Can handle criticism without denial, blame, excuses or anxiety;
4. IQ test score over 100;
5. Grandmaster at the Game of ‘Go’.
How are AI and HI different?
Where have you been this morning?

What do you know about AI?

How well do you understand the COVID-19 Pandemic?

How are you feeling right now?
Artificial Intelligence (AI) is intelligent in a particular sort of way, Humans are intelligent in many ways. AI and HI are not the same and the differences are extremely important.

We want humans to complement the AI automation not repeat it!
1. Interdisciplinary Academic intelligence
2. Meta-knowing intelligence
3. Social intelligence
4. Meta-cognitive intelligence
5. Meta-subjective intelligence
6. Meta-contextual intelligence
7. Perceived self-efficacy
1. Interdisciplinary Academic intelligence
2. Meta-knowing intelligence
3. Social intelligence
4. Meta-cognitive intelligence
5. Meta-subjective intelligence
6. Meta-contextual intelligence
7. Perceived self-efficacy
What is Human Intelligence in an AI world?

Interwoven Intelligence
• 7 elements to human level intelligence: all elements are essential;
• 5 elements can be considered under the heading meta intelligence;
Using AI in Education to tackle some of the big educational challenges

The Potential
AI is SO Much more than technology
How can data be used to improve learning environments?

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

It can also be the power behind HI.
AI in Education Today: The Potential

“Why did Apple make you”
tap to edit

For one reason only: to make your life easier, and more fun (I guess that's two reasons, huh?)
## PELARS CPS Framework

### Collaborative problem solving dimensions

<table>
<thead>
<tr>
<th></th>
<th>Establishing and Maintaining Shared Understanding</th>
<th>Taking Appropriate Actions to Solve the Problem</th>
<th>Establishing and Maintaining Team Organization</th>
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</thead>
<tbody>
<tr>
<td>Identifying Facts</td>
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<tr>
<td>Representing and Formulating Knowledge</td>
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<td>Generating Hypotheses</td>
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<td>Planning and Executing</td>
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<tr>
<td>Knowledge and Skill Deficiencies</td>
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<tr>
<td>Monitoring, Reflecting, and Applying</td>
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</tbody>
</table>
Non-verbal signifiers of CPS?

**Synchrony** – Students’ visual synchrony, measured with eye-trackers, positively correlated with students’ learning (Schneider and Pea, 2013);

**Individual Accountability** - Group goals and individual accountability, 2 key features of successful groups (Slavin, 1991).

**Equality** - two-way dialogue taking direction from one another (Damon and Phelps, 1989; Dillenbourg, et al., 2016)

**Intra-individual variability** – The creation of a common ground among group members based on students’ ability to understand (Marlowe, 1986).
Machine Coding of Student’s Non-verbal Behaviours

- Active (2) whenever a student’s hand is active with an object,
- Semi-active (1) when a student is not physically active but his head is directed toward a peer (or a teacher) who is active,
- Passive (0) passive if a student is not physically active with any object and his head is directed somewhere other than any of the peers who were active.
Synchrony – Schneider and Pea (2013) found that students’ visual synchrony, measured with eye-trackers, positively correlated with students’ learning gains. (NOT body synchronization though).
Tutor Training
How can analytic classification models support the intuitive decision-making processes of expert tutors while they are evaluating tutor trainees?

What are the relative accuracies of unimodal and multimodal models in classifying tutor trainees?
Learning Sciences about decision making: a consensus that it is a process.

2 categories: heuristic, operating autonomously and automatically (Kahneman & Frederick, 2002).

**Analytic**, performed step-by-step, deliberatively controlled, consciously aware and open to reflection (Betsch, 2008).

**Heuristic** = faster and less effortful, but subject to decision biases (Evans, 2003; Kahneman, 2003).

**Analytical** = slower, deliberative, reflective, able to guard us against biases in intuitive decision making (Kahneman & Frederick, 2002).
Multimodal classification, based on the experience, survey, and two of the stronger predicting variables from our analysis of audio data.

Significant components accounting for most of the variance of the designed questionnaire.

<table>
<thead>
<tr>
<th>Observed score</th>
<th>Estimated score</th>
<th>Percent correct</th>
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<tbody>
<tr>
<td>1/2</td>
<td>3</td>
<td>4/5</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>19</td>
<td>2</td>
</tr>
<tr>
<td>0</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>22.0%</td>
<td>58.5%</td>
<td>19.5%</td>
</tr>
</tbody>
</table>
Data multi-modal and multiple sources

AI algorithms designed with learning scientists

Human Intelligence teachers, learners, parents, employers....
POLL
How can we unlock the potential for AI to transform education in the UK?

WORD CLOUD
AI and Education
how can we bring about transformational change?
Participatory Design through multi-stakeholder partnerships
UCL EDUCATE
Understanding and improving the London EdTech ecosystem
How is research evidence relevant to me and how can I find out what teachers and learners think of my product and test its efficacy?

How can I better communicate my research to teachers and companies? How can I demonstrate impact?

How can I find out what works when using technology to support learning? How can I use research evidence?

Improve EdTech products and services; Improve learning; Improve teaching; Increase sales; Increase research impact.

The Golden Triangle

Academia

Education

Evidence
ENABLER 1
Train educators and trainers

ENABLER 2
Train AI developers

ENABLER 3
Engage educators, trainers, researchers and AI developers in co-development

Data, evidence and research
By helping educational institutions (and businesses) get AI Ready
The 7 steps to AI Readiness: EThICAL

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

1) Educate, enthuse, excite – about building within your community an AI mindset
2) Tailor and hone - the particular challenges you want to focus on
3) Identify – identify (wisely), collate and
4) Collect – new data relevant to your focus
5) Apply - AI techniques to the relevant data you have brought together
6) Learn – understand what the data is telling you about your focus and return to step 1 until you are AI ready
7) iterate

And all these steps should be done ethically
Modeling Using Machine Learning techniques to profile traders and make predictions

- Behavioral Data From Questionnaires
- Recruitment Data From Tests, Interviews and Videos
- Trading History Data From Trading Platforms
- Multimodal Data From Eye-Movements and Button clicks

 Trader Profiles
Opportunities to IA MINDSET

1. Map the organization’s Data-Information-Knowledge-Wisdom pyramid (and who’s where)
2. Identify data sources: what is ready to be picked, what still needs to be ripened or sown
3. What can we learn from previous (successful or failed) experiments or pilots? What hypotheses do they already have? What are their blind spots?
4. Metrics – how do we know we got something right? What does success look like?
How ready is your organization to leverage AI?

* More than ready – we are all using AI
* Somewhat ready – some people are using AI
* Aware of AI, but not yet using it
* Not at all ready – ‘not on our radar’
Implications for Education

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

http://instituteforethicalaiineducation.org
Conclusions

• COVID-19 may change the way we teach and learn forever, and AI has a key role to play in this transformation.

• AI's application in education can support teachers and learners now… BUT…

• We must look towards the future and consider how AI can support a COVID-compliant transformation of our education system - a transformation that seeks to enable all learners to achieve their full potential.

• This means revising the way we value Human Intelligence and it means moving beyond the ‘device/application’ stage in the evolution of AI.

…AND…We will also all need to become 'AI ready.'

To unlock the human potential in every learner
References and Resources


AI Readiness

Free to join and downloadable videos can be found her: https://www.educateventures.com/webinars
Thank you