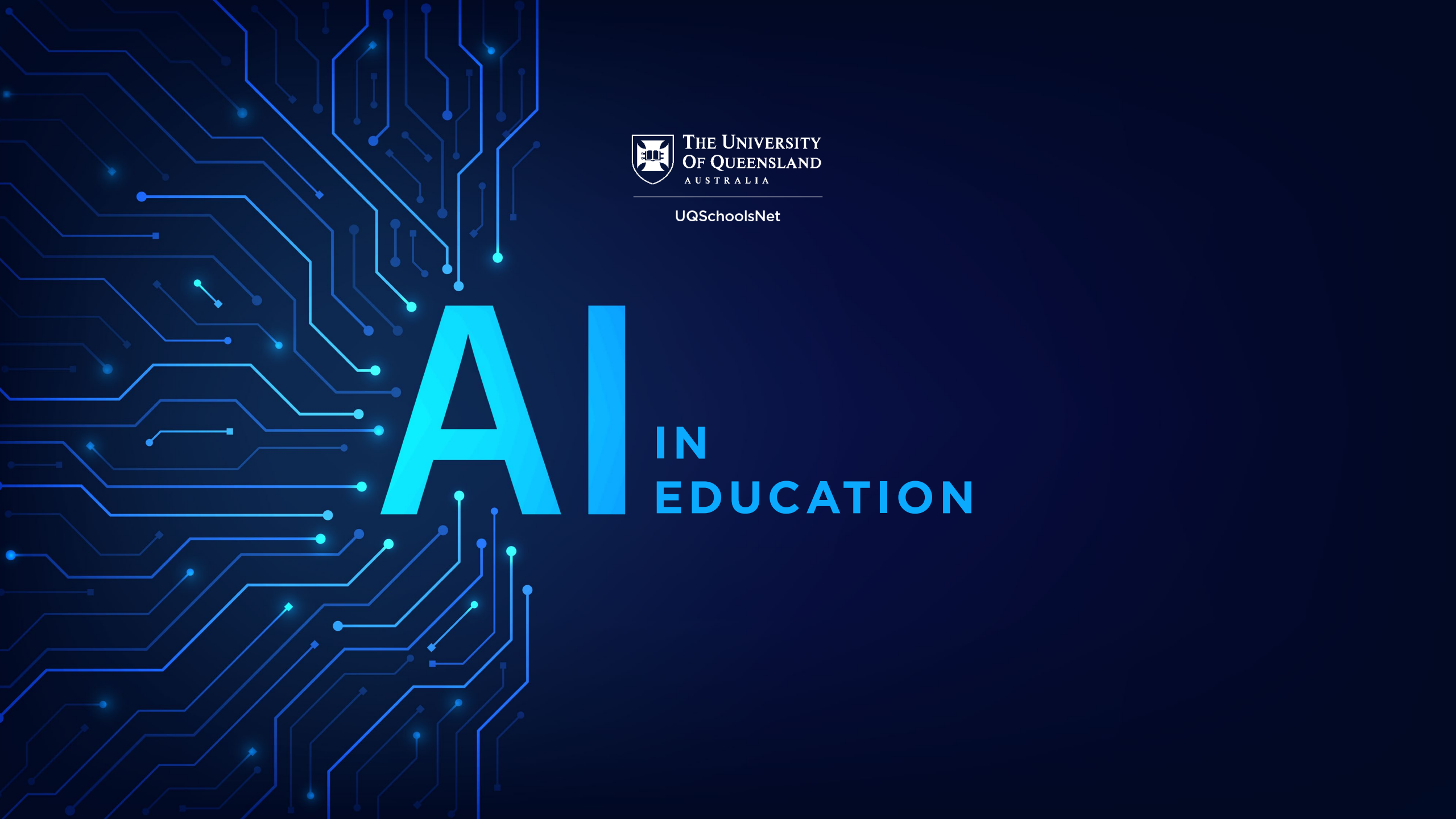

THE UNIVERSITY OF QUEENSLAND
AUSTRALIA
UQSchoolsNet
AI
IN
EDUCATION

Acknowledgement of Country

UQSchoolsNet through the University of Queensland (UQ) acknowledges the Traditional Owners and their custodianship of the lands on which we meet.

We pay our respects to their Ancestors and their descendants, who continue cultural and spiritual connections to Country.

We recognise their valuable contributions to Australian and global society.

Image: Digital reproduction of A guidance through time by Casey Coolwell and Kyra Mancktelow

AI in education

Jason M. Lodge, PhD, PFHEA
School of Education
Faculty of Humanities, Arts and Social Sciences
The University of Queensland

THE UNIVERSITY OF QUEENSLAND
AUSTRALIA
CREATE CHANGE

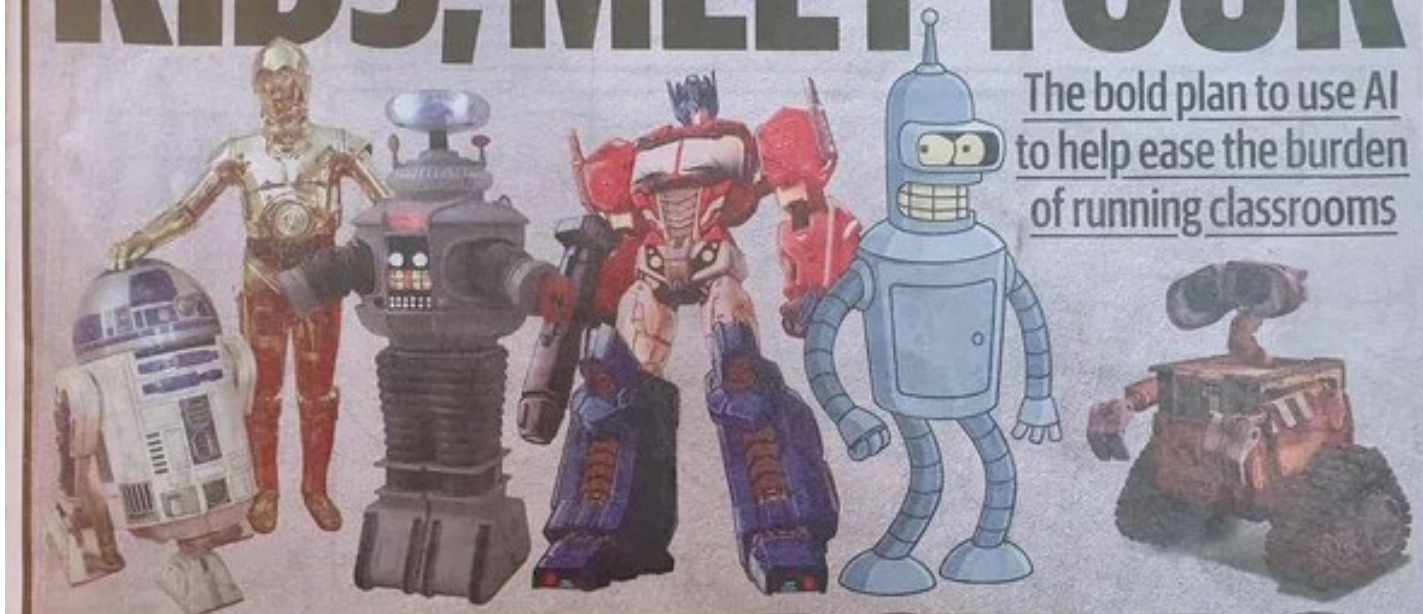
Eliza

```
ELIZA: Please tell me what's been bothering you.
YOU:   Everything
ELIZA: Tell me more about that.
YOU:   Everything bothers me lately
ELIZA: Does talking about this bother you ?
YOU:   No, oddly enough
ELIZA: Why 'no' ?
YOU:   It just doesn't
ELIZA: I'm not sure I understand you fully.
YOU:   It doesn't bother me to talk about it
ELIZA: Do you feel strongly about discussing such things ?
YOU:   I don't know, should I?
ELIZA: Don't you really know ?
YOU:   Really I don't
ELIZA: Why don't you ?
YOU:   Are you here to help me or not?
ELIZA: Why are you interested in whether I am here to help you
or not or not ?
```

Talk Reset

KIDS, MEET YOUR NEW TEACHERS

The bold plan to use AI to help ease the burden of running classrooms



EXCLUSIVE BETHANY HIATT

Time-strapped WA teachers could gain access to artificial intelligence tools to ease their workloads under plans to cut red tape.

Education Minister Tony Buti will on Thursday unveil initiatives to lighten the administrative burden for teachers, which will include examining ways to harness powerful AI chatbots such as ChatGPT.

Next year the Education Department — in partnership with private schools and curriculum authorities — will test AI tools to see how they can be best used to streamline planning and enhance teaching.

The department will set up AI "demonstration environments" for teachers to explore and provide feedback on the effectiveness of AI for improving classroom learning and reducing workloads.

The sudden rise of generative AI

CONTINUED PAGE 4

Participant responses

Generative AI – what are the issues?

- Relevance and scope of use
- Academic integrity
- Ethical use
- Bias
- Ai, values and bias
- Delusion of accuracy
- Ethical use - syllabus docs and policies behind AI TECH
- Teachers being able to balance academic integrity and digital fluency - implications for both
- Ai changing society… what to teach,
- Security isseus, bias, and false information
- Academic integrity
- World domination
- Equipping the world with the skills to use it safely & effectively
- Students using A.I. for their work too much
- Ethical design
- Teaching students to use Generative AI to think more rather than less
- Not using AI to plan and scaffold ideas
- Students not having the ability to edit AI responses to make them their own.
- Safety
- Reliability of facts
- IP

Participant responses

Generative AI – what are the issues?

- Establishing guidelines for safe and responsible use
- Ethic use
- Students not constructing their own thoughts
- Bring teams on the journey
- Privacy
- "Plagarism,lack of critical understanding around Use“
- Data privacy
- Accuracy
- Student level of thinking
- Teaching Chat Promots
- How to teach
- Lack of teacher confidence
- Cost of using AI and the digital divide this will cause
- Ethical function
- integrity guard rails for age / physiological age
- Catering to all levels of comfort/ fear of AI
- Bias
- How to integrate it effectively
- Contextual relevance
- Content and process changes due to Ai
- Knowing it’s working correctly
- Purpose

Generative AI - where are we at?

AI SUPREMACY

Goldman Sachs and Economists are Backtracking on Generative AI's Value

Is BigTech's investment in Generative AI warranted? Trillion dollar bets that look increasingly like gambling.

MICHAEL SPENCER
JULY 3 AT 5:57 AM

Gary Marcus
@GaryMarcus

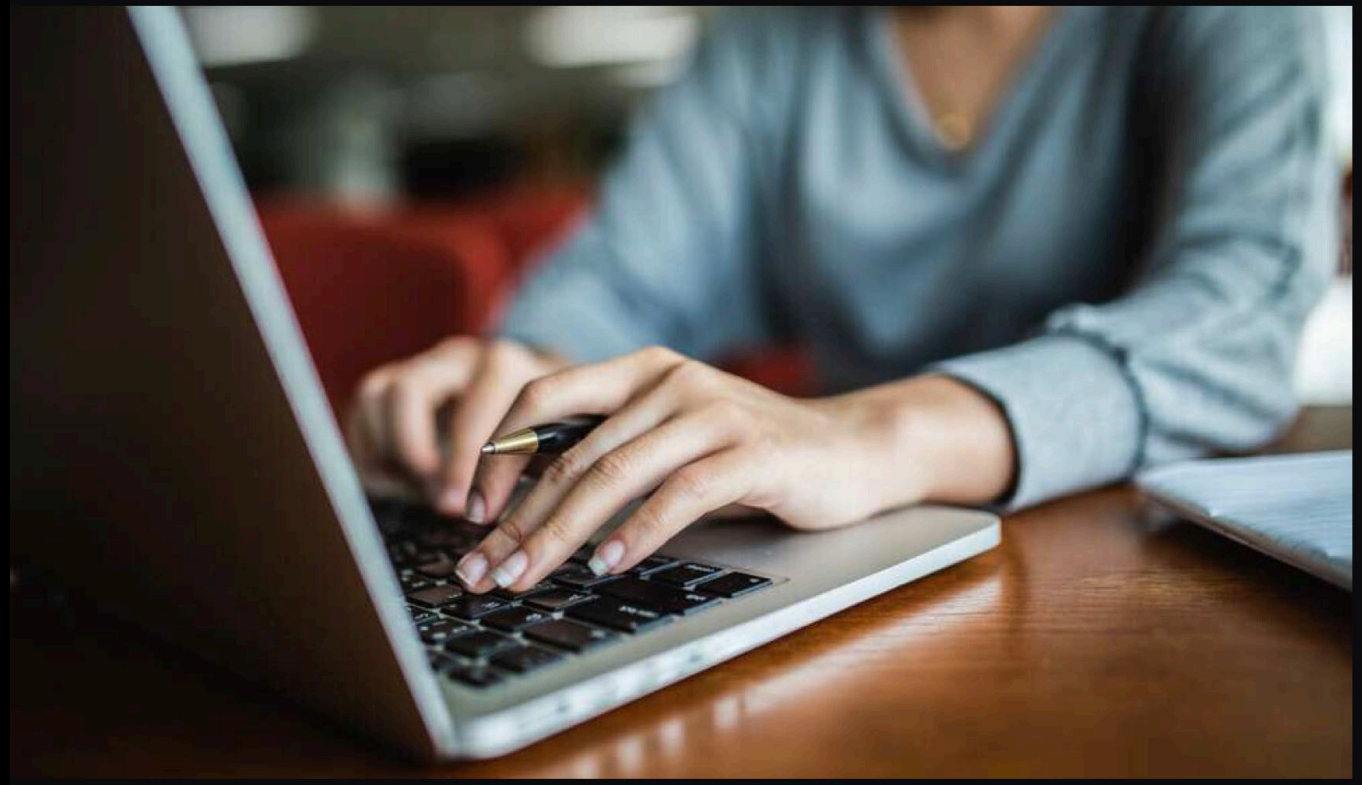
Within 12 months, the GenAI bubble will have burst.

- The economics don’t work
- The current approach has reached a plateau
- There is no killer app
- Hallucinations remain
- Boneheaded errors remain
- Nobody has a moat
- People are starting to realize all of the above.

Life

I use AI to get ahead at university. Some call it cheating but I say it's a necessity

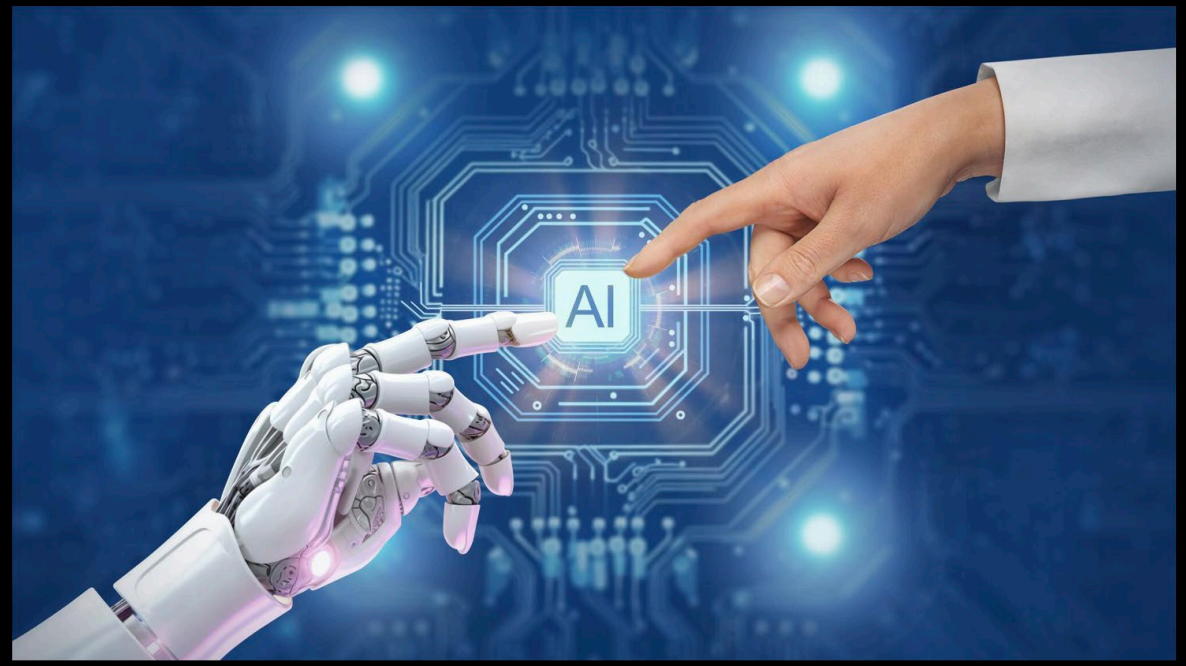
The rising cost of living means some university students have to work more and study less, and some say generative AI is a valuable time-saving technology. But does it count as cheating? Or are universities just becoming increasingly redundant in the face of rapid technological change?



Megan* uses AI to help her with university assignments, and she doesn't consider it cheating. Source: Watchara Piriyaputtanapun/Getty Images

THE AUSTRALIAN

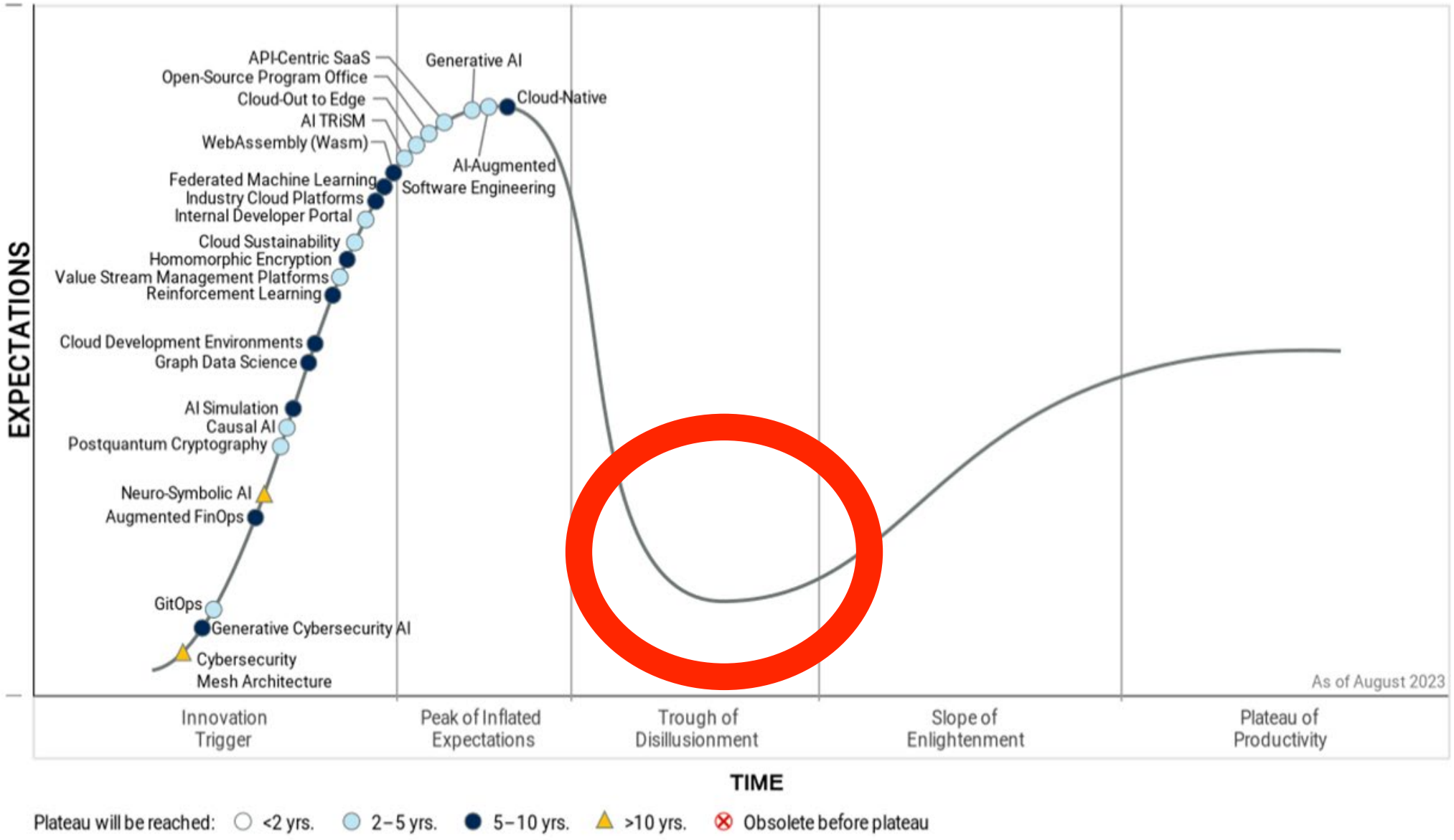
Unis warned: chatbots taking over and return to ‘pen and paper’ is futile



White cyborg robotic hand pointing his finger to human hand with stretched finger - ai artificial intelligence.

By JOANNA PANAGOPOULOS

6:44PM AUGUST 20, 2024


EXPECTATIONS
API-Centric SaaS
Open-Source Program Office
Cloud-Out to Edge
AI TRiSM
WebAssembly (Wasm)
Federated Machine Learning
Industry Cloud Platforms
Internal Developer Portal
Cloud Sustainability
Homomorphic Encryption
Value Stream Management Platforms
Reinforcement Learning
Cloud Development Environments
Graph Data Science
AI Simulation
Causal AI
Postquantum Cryptography
Neuro-Symbolic AI
Augmented FinOps
GitOps
Generative Cybersecurity AI
Cybersecurity Mesh Architecture
Generative AI
Cloud-Native
AI-Augmented Software Engineering
As of August 2023
Innovation Trigger
Peak of Inflated Expectations
Trough of Disillusionment
Slope of Enlightenment
Plateau of Productivity
TIME
Plateau will be reached: <2 yrs. 2–5 yrs. 5–10 yrs. >10 yrs. Obsolete before plateau

Gartner

Academics despair as ChatGPT-written essays swamp marking season

‘It’s not a machine for cheating; it’s a machine for producing crap,’ says one professor infuriated by rise of bland scripts

June 17, 2024

Jack Grove

Twitter: @jgro_the

The increased prevalence of students using ChatGPT to write essays should prompt a rethink about whether current policies encouraging “ethical” use of artificial intelligence are working, scholars have argued.

With marking season in full flow, lecturers have taken to social media in large numbers to complain about AI-generated content found in submitted work.

Source: Richard Rodriguez/Getty Images for Texas Motor Speedway

‘It’s not a machine for cheating; it’s a machine for producing crap.’

Where are we now?

What does it mean?

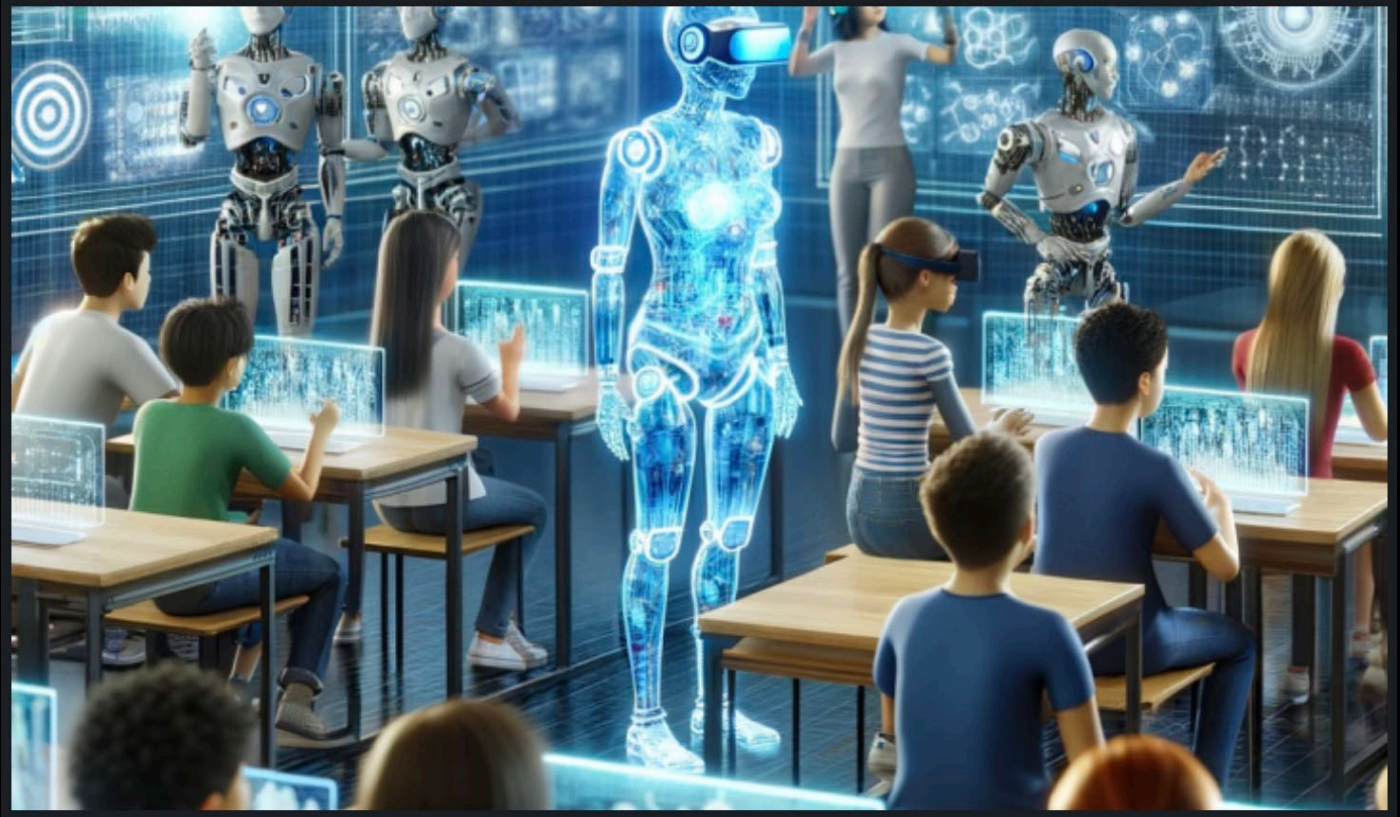


Image of AI infused classroom generated by ChatGPT (GPT-4)

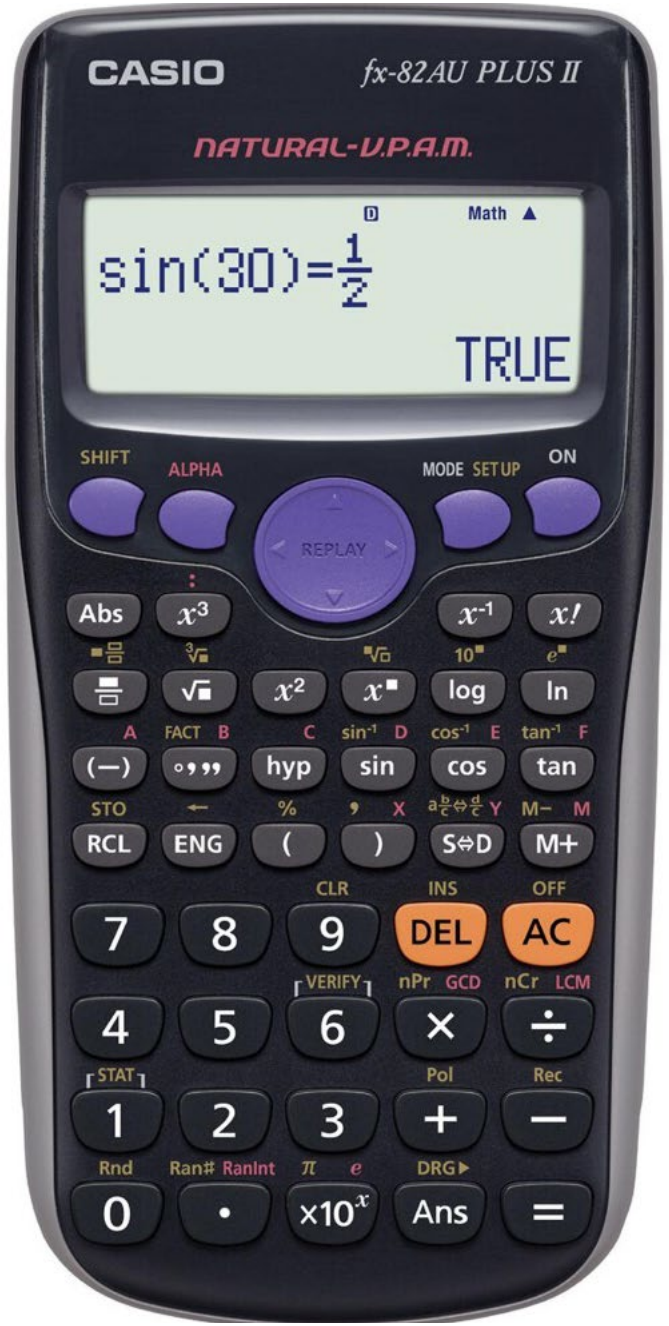
The acute and chronic problems of AI in education

Jason M. Lodge
Deputy Associate Dean (Academic) & Associate Professor of Educational Psychology

Technology

VERITY

Will AI surpass human intelligence, and when?


CASIO
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NATURAL-V.P.A.M.
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Math
sin(30)=1/2
TRUE
SHIFT
ALPHA
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REPLAY
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x!
10
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log
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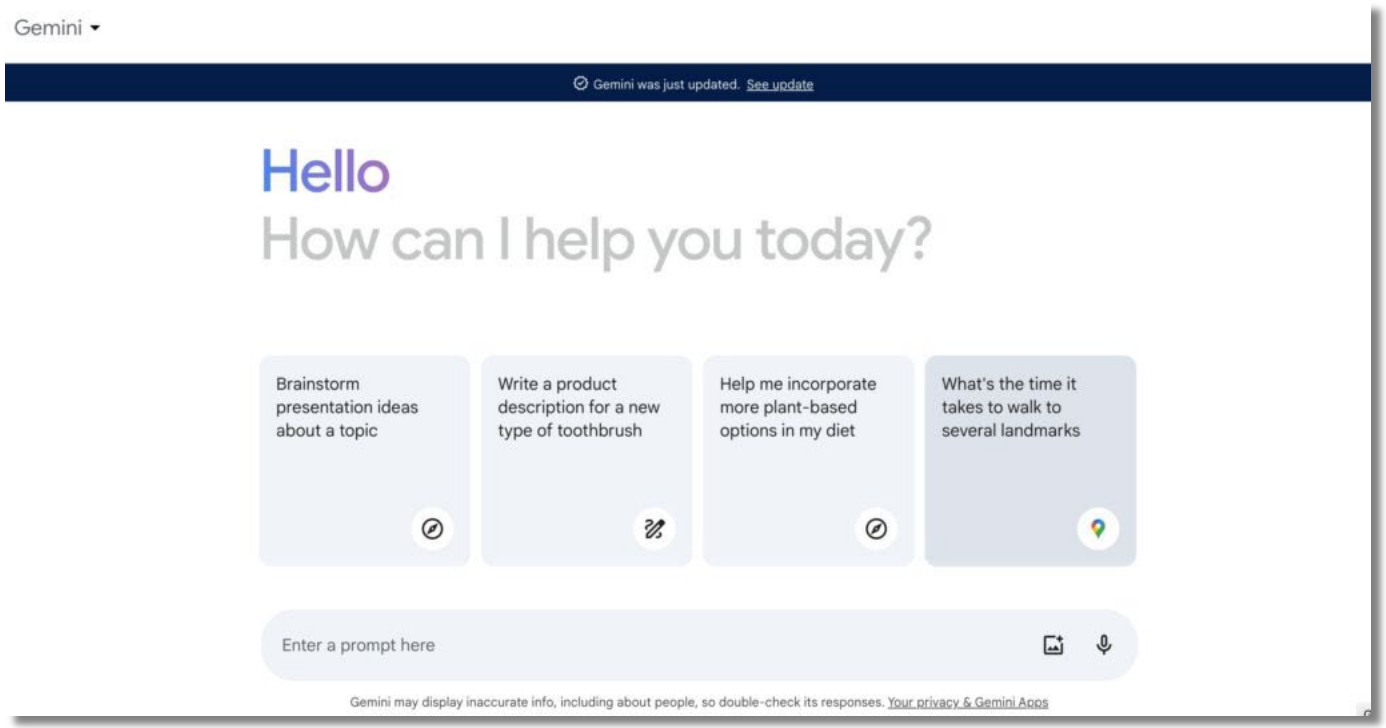
Gemini
Gemini was just updated. See update
Hello
How can I help you today?
Brainstorm presentation ideas about a topic
Write a product description for a new type of toothbrush
Help me incorporate more plant-based options in my diet
What's the time it takes to walk to several landmarks
Enter a prompt here
Gemini may display inaccurate info, including about people, so double-check its responses. Your privacy & Gemini Apps

LEARNING: RESEARCH AND PRACTICE
https://doi.org/10.1080/23735082.2023.2261106

Routledge
Taylor & Francis Group

It's not like a calculator, so what is the relationship between learners and generative artificial intelligence?

Jason M. Lodge [a], Suijing Yang [a], Leon Furze [b] and Phillip Dawson [c]

[a]School of Education, The University of Queensland, St. Lucia, Australia; [b]School of Education, Deakin University, Melbourne, Australia; [c]Centre for Research in Assessment and Digital Learning, Deakin University, Melbourne, Australia

ABSTRACT

It is becoming apparent that generative AI has significant implications for education. However, previous technologies that have had a large impact, such as calculators, do not provide a suitable model for understanding how generative AI can and will be used in learning. Drawing on research on human-computer interactions, we map out a typology of possible student-to-generative AI relationships to afford a more nuanced discussion about what these new technologies can and should be used for in learning. Our contribution in this article is to offer a typology for considering the range of possible interactions across two dimensions of relationships. In doing so, we argue that there is not a single metaphor for the relationship between humans and AI in learning, but many.

ARTICLE HISTORY
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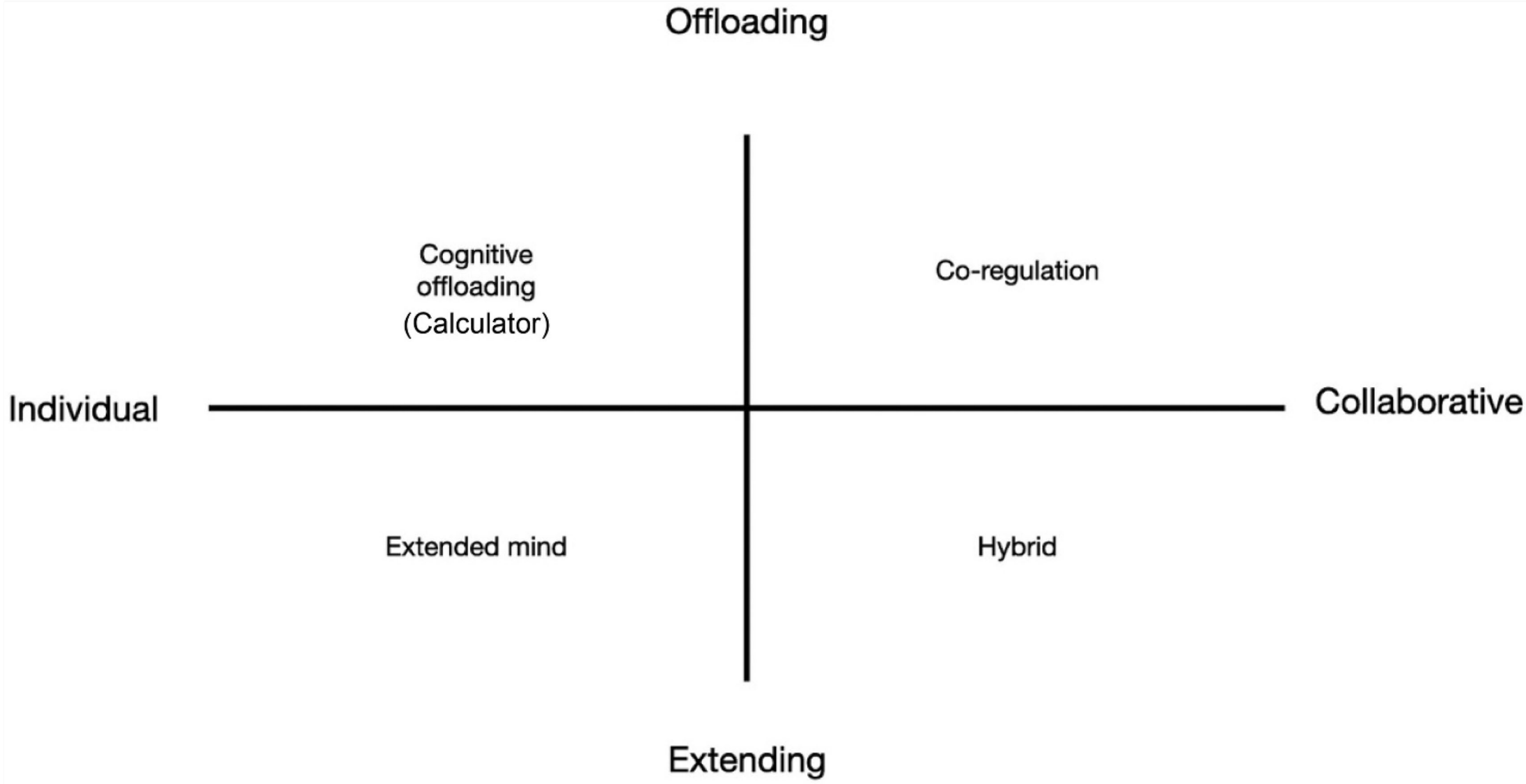
Accepted 16 September 2023

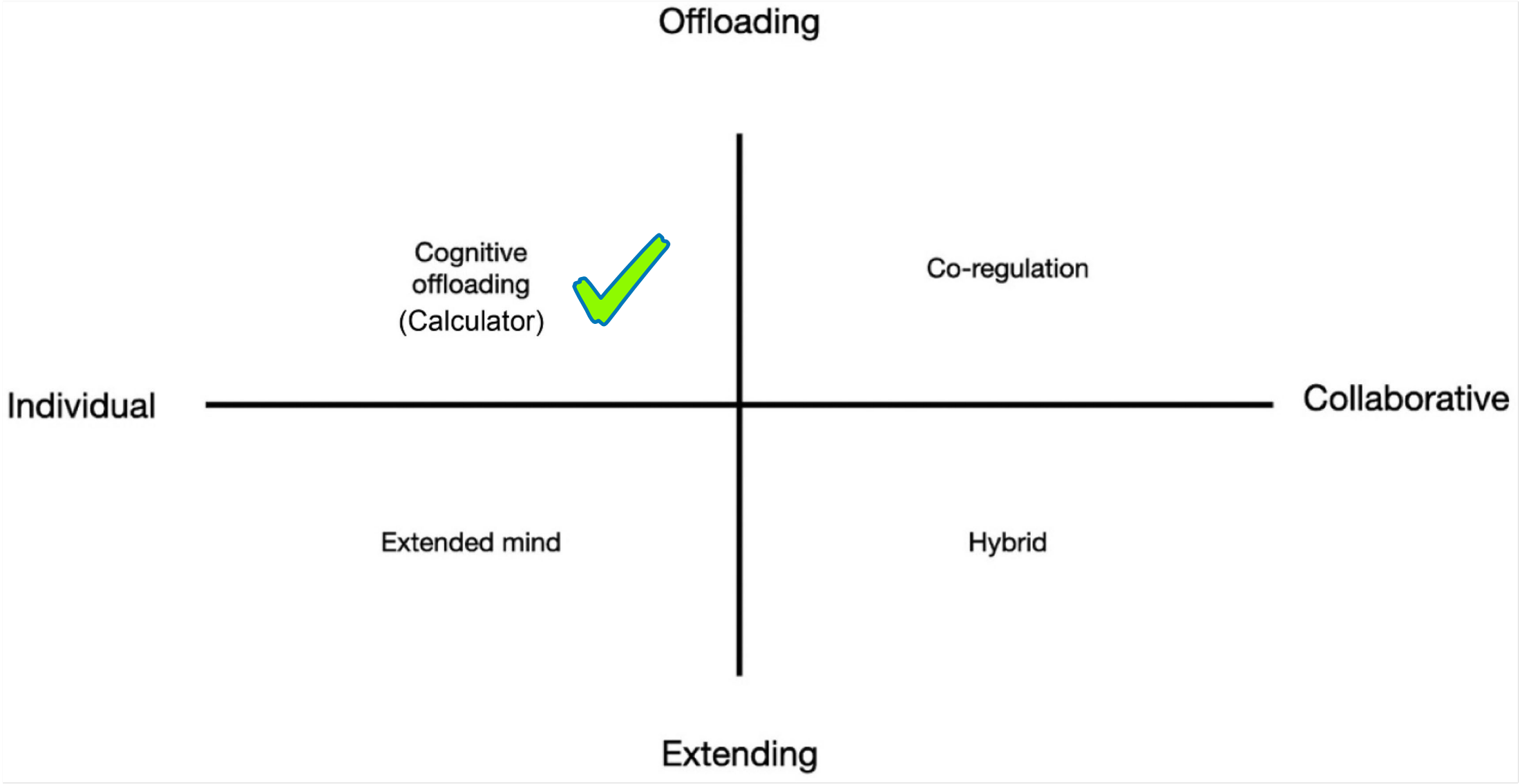
KEYWORDS
Generative AI; learners; human-computer interaction


Offloading
Cognitive offloading (Calculator)
Co-regulation
Individual
Collaborative
Extended mind
Hybrid
Extending

Explaining

Brainstorming

Feedback?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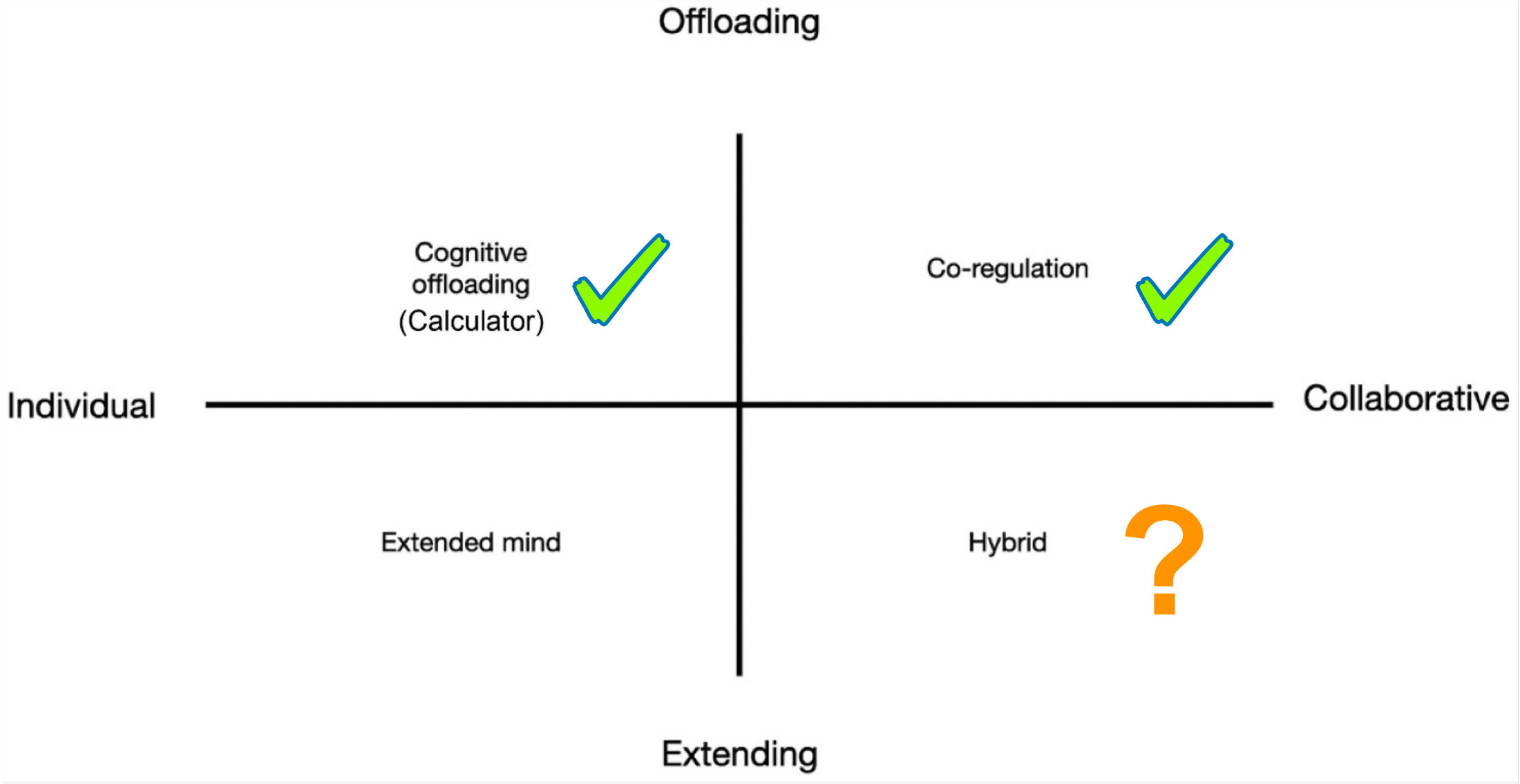
Offloading
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FINANCIAL TIMES

Will AI revolutionise education for the better?

Teachers need to guide students to use the technology in a way that will benefit them without shortcutting learning


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Will AI revolutionise education for the better?
Teachers need to guide students to use the technology in a way that will benefit them without shortcutting learning

Pedagogy

Degrees devalued
Australian universities

‘Nobody is blind to it’: mass cheating through AI puts integrity of Australian universities at risk, academics claim

Caitlin Cassidy *Education reporter*

Wed 31 Jul 2024 01.00 AEST

Teachers are helpless to stop AI cheating

John Davidson
Columnist

Sep 6, 2023 – 3.51pm

Listen to this article
3 min

At least 50 per cent of teachers have had to mark assignments they were certain had been written by ChatGPT or other generative AI platforms, but their schools had no policies to deal with the problem, a government inquiry into the use of artificial intelligence in education has heard.

That issue is compounded by there being no tools available to help teachers detect AI-generated content, and even linguists say it is impossible to tell human- and computer-generated text apart, a panel of four education experts told the House standing committee on employment, education and training on its first day of public hearings.

The great challenge?
Cheating?

The acute problem

	Short-term	Medium-term	Long-term
1. Ignore			
	Cannot enforce		
3. Invigilate	Where appropriate	Where appropriate	Where appropriate
4. Embrace	Being mindful of equity issues		
5. Design around			
6. Rethink	Requires time and effort		

Adapted from: Lodge, Howard & Broadbent, (2023). *Assessment redesign for generative AI: A taxonomy of options and their viability*, LinkedIn.

2 Guiding Principles

1. Assessment and learning experiences equip students to participate ethically and actively in a society pervaded with AI

AI represents a catalyst for change unlike anything else in the past. It does not just influence how students learning can be assessed, it also influences what is worth assessing and, consequentially, what and how students learn. This necessarily includes the ability to use AI tools, as well as a broader understanding of the ethics, limitations, biases, and implications of AI.

2. Forming trustworthy judgements about student learning in a time of AI requires multiple, inclusive and contextualised approaches to assessment

There is no single assessment type that can account for all desirable and undesirable uses of AI by students. Using multiple assessments of different types, when triangulated, provides greater trustworthiness and allows for practices that are more inclusive.

5 Propositions

Assessment should emphasise...

1. ...appropriate, authentic engagement with AI
2. ...a programmatic/systemic approach aligned with discipline and qualification values
3. ...the process of learning
4. ...opportunities for students to work appropriately with each other and AI
5. ...security at meaningful points across a program to inform decisions about progression and completion

Midjourney generated image of student working hard on their learning

Stop looking for evidence of cheating with AI and start looking for evidence of learning

Cath Ellis
Professor, National Teaching Fellow, PFHEA

July 9, 2024

With Jason M. Lodge

Australian Government
Tertiary Education Quality and Standards Agency

The evolving risk to academic integrity posed by generative artificial intelligence: Options for immediate action

Associate Professor Jason M Lodge,
The University of Queensland

August 2024

TEQSA

Australian Framework for Generative Artificial Intelligence in Schools

Image: Sophie Lindsay, Student, NSW Department of Education. Tom Lindsay, Teacher, NSW Department of Education.

Australian Framework for Generative Artificial Intelligence in Schools

The Australian Framework for Generative Artificial Intelligence (AI) in Schools (the Framework) seeks to guide the responsible and ethical use of generative AI tools in ways that benefit students, schools and society. It was developed on behalf of all Education Ministers by the National AI in Schools Taskforce, which includes representatives from all jurisdictions, education sectors and the national education agencies.

Teaching and Learning

Generative AI tools are used to support and enhance teaching and learning.

1.1 Impact: generative AI tools are used in ways that enhance and support teaching, school administration, and student learning.

1.2 Instruction: schools engage students in learning about generative AI tools and how they work, including their potential limitations and biases, and deepen this learning as student usage increases.

1.3 Teacher expertise: generative AI tools are used in ways that support teacher expertise, and teachers are recognised and respected as the subject matter experts within the classroom.

1.4 Critical thinking: generative AI tools are used in ways that support and enhance critical thinking and creativity, rather than restrict human thought and experience.

1.5 Learning design: work designed for students, including assessments, clearly outlines how generative AI tools should or should not be used and allows for a clear and unbiased evaluation of student ability.

1.6 Academic integrity: students are supported to use generative AI tools ethically in their schoolwork, including by ensuring appropriate attribution.

Human and Social Wellbeing

Generative AI tools are used to benefit all members of the school community.

2.1 Wellbeing: generative AI tools are used in ways that do not harm the wellbeing and safety of any member of the school community.

2.2 Diversity of perspectives: generative AI tools are used in ways that expose users to diverse ideas and perspectives and avoid the reinforcement of biases.

2.3 Human rights: generative AI tools are used in ways that respect human and worker rights, including individual autonomy and dignity.

Transparency

School communities understand how generative AI tools work, how they can be used, and when and how these tools are impacting them.

3.1 Information and support: teachers, students, staff, parents and carers have access to clear and appropriate information and guidance about generative AI.

3.2 Disclosure: school communities are appropriately informed when generative AI tools are used in ways that impact them.

3.3 Explainability: vendors ensure that end users broadly understand the methods used by generative AI tools and their potential biases.

Fairness

Generative AI tools are used in ways that are accessible, fair, and respectful.

4.1 Accessibility and inclusivity: generative AI tools are used in ways that enhance opportunities, and are inclusive, accessible, and equitable for people with disability and from diverse backgrounds.

4.2 Equity and access: regional, rural and remote communities are considered when implementing generative AI.

4.3 Non-discrimination: generative AI tools are used in ways that support inclusivity, minimising opportunities for, and countering, unfair discrimination against individuals, communities, or groups.

4.4 Cultural and intellectual property: generative AI tools are used in ways that respect the cultural rights of various cultural groups, including Indigenous Cultural and Intellectual Property (ICIP) rights.

Accountability

Generative AI tools are used in ways that are open to challenge and retain human agency and accountability for decisions.

5.1 Human responsibility: teachers and school leaders retain control of decision making and remain accountable for decisions that are supported by the use of generative AI tools.

5.2 Reliability: generative AI tools are tested before they are used, and reliably operate in accordance with their intended purpose.

5.3 Monitoring: the impact of generative AI tools on school communities is actively and regularly monitored, and emerging risks and opportunities are identified and managed.

5.1 Contestability: members of school communities that are impacted by generative AI tools are actively informed about, and have opportunities to question, the use or outputs of the tools and any decisions informed by the tools.

Privacy, Security and Safety

Students and others using generative AI tools have their privacy and data protected.

6.1 Privacy and data protection: generative AI tools are used in ways that respect and uphold privacy and data rights, comply with Australian law, and avoid the unnecessary collection, limit the retention, prevent further distribution, and prohibit the sale of student data.

6.2 Privacy disclosure: school communities are proactively informed about how and what data will be collected, used, and shared while using generative AI tools, and consent is sought where needed.

6.3 Protection of student inputs: students, teachers and staff take appropriate care when entering information into generative AI tools which may compromise any individual's data privacy.

6.4 Cyber-security and resilience: robust cyber-security measures are implemented to protect the integrity and availability of school infrastructure, generative AI tools, and associated data.

6.5 Copyright compliance: when using generative AI tools, schools are aware of, and take measures to comply with, applicable copyright rights and obligations.

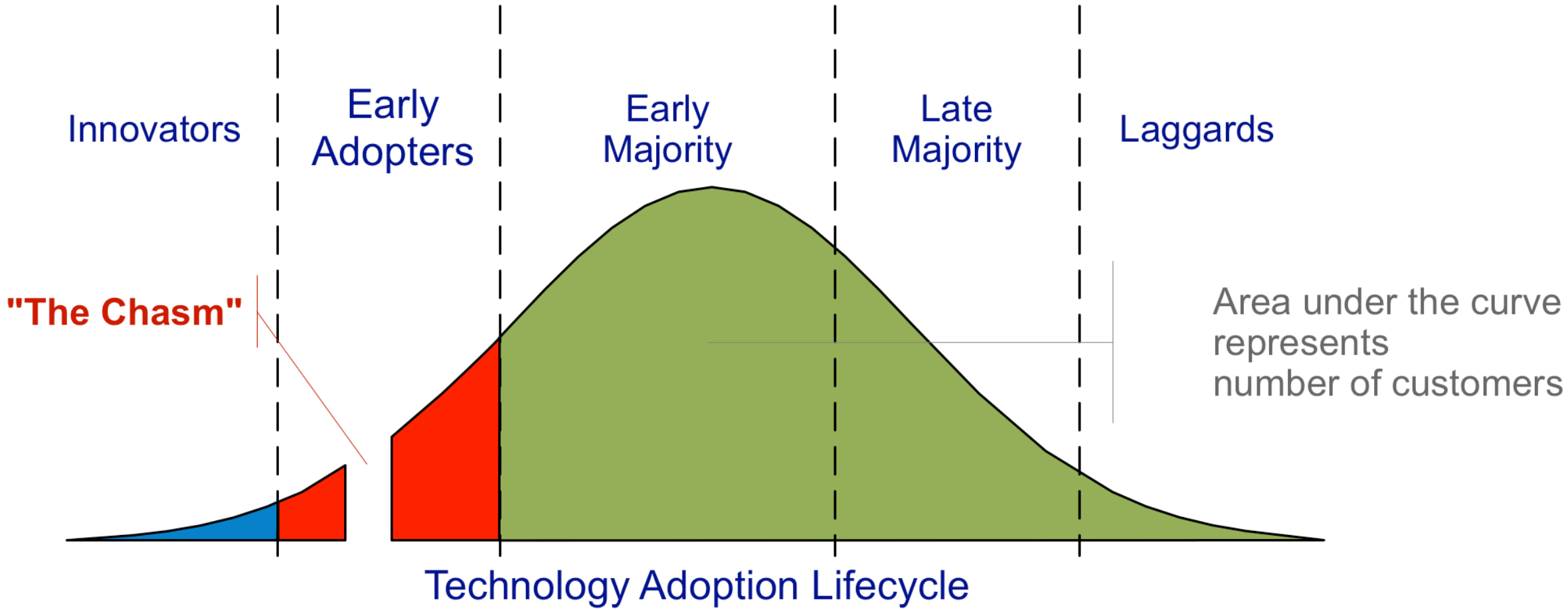
How to teach, learn and assess with AI

Learning, Instruction and Technology Lab
School of Education
11 June 2024

THE UNIVERSITY OF QUEENSLAND
AUSTRALIA
CREATE CHANGE

Implications of AI and Emerging Technologies for Teaching and Learning

What are students doing?


Innovators
Early Adopters
Early Majority
Late Majority
Laggards
"The Chasm"
Area under the curve represents number of customers
Technology Adoption Lifecycle

1/3 don’t touch it

1/3 don’t touch it

1/3 use it superficially

1/3 don’t touch it

1/3 use it superficially

1/3 use it to or close to its potential

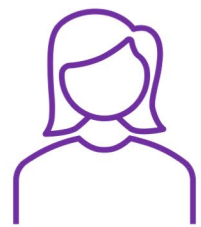
What are students using it for?

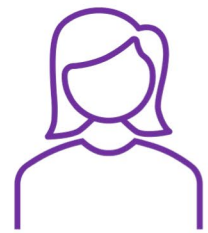
1. Explaining things

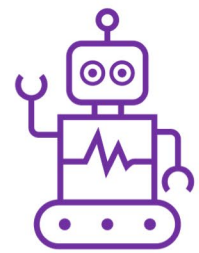
1. Explaining things
2. Brainstorming ideas

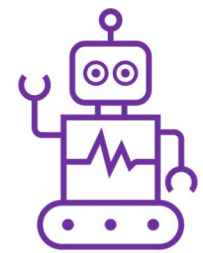
10 - 15% using it for writing assignments (apparently)

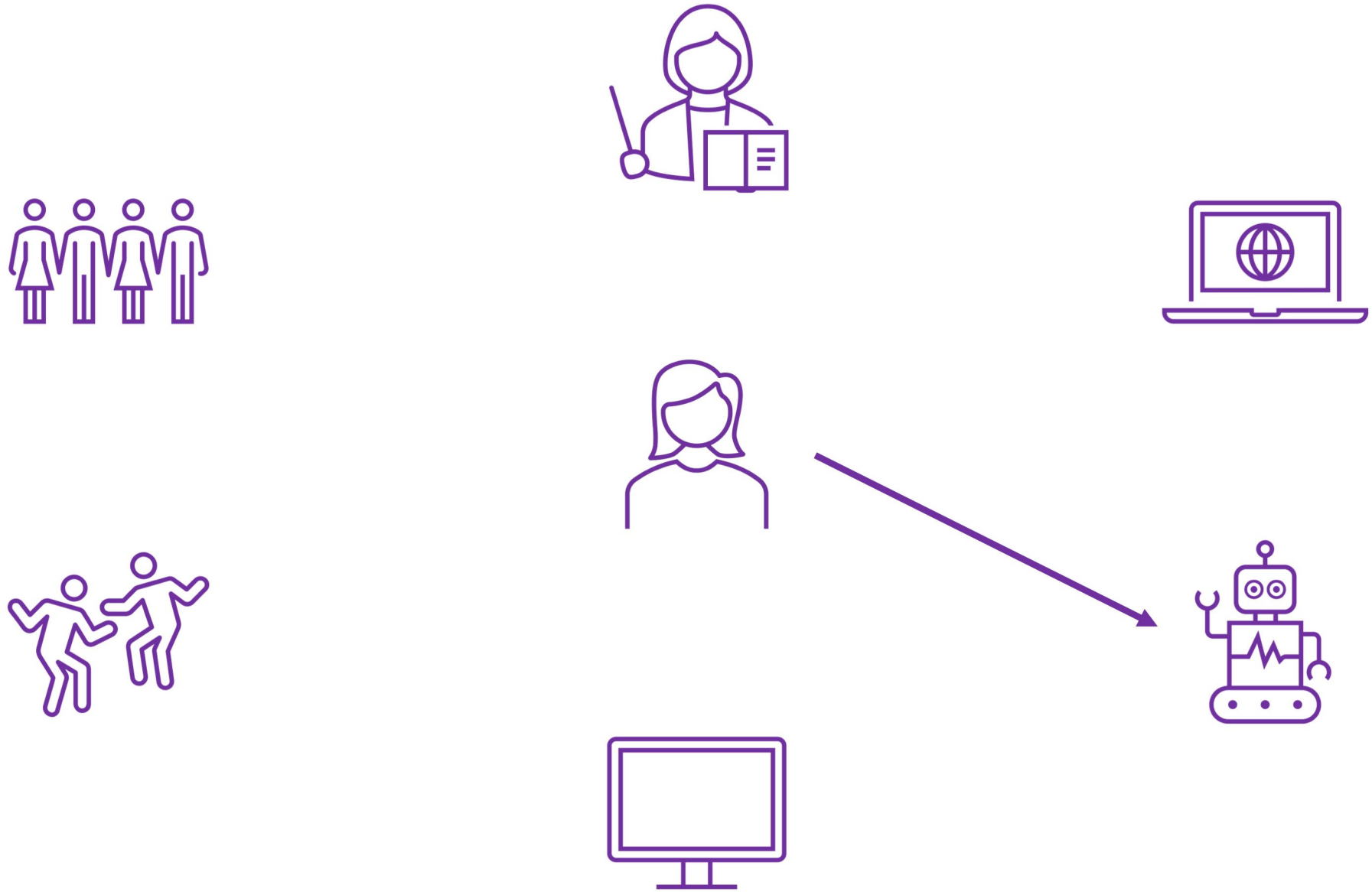
What does more effective use look like?

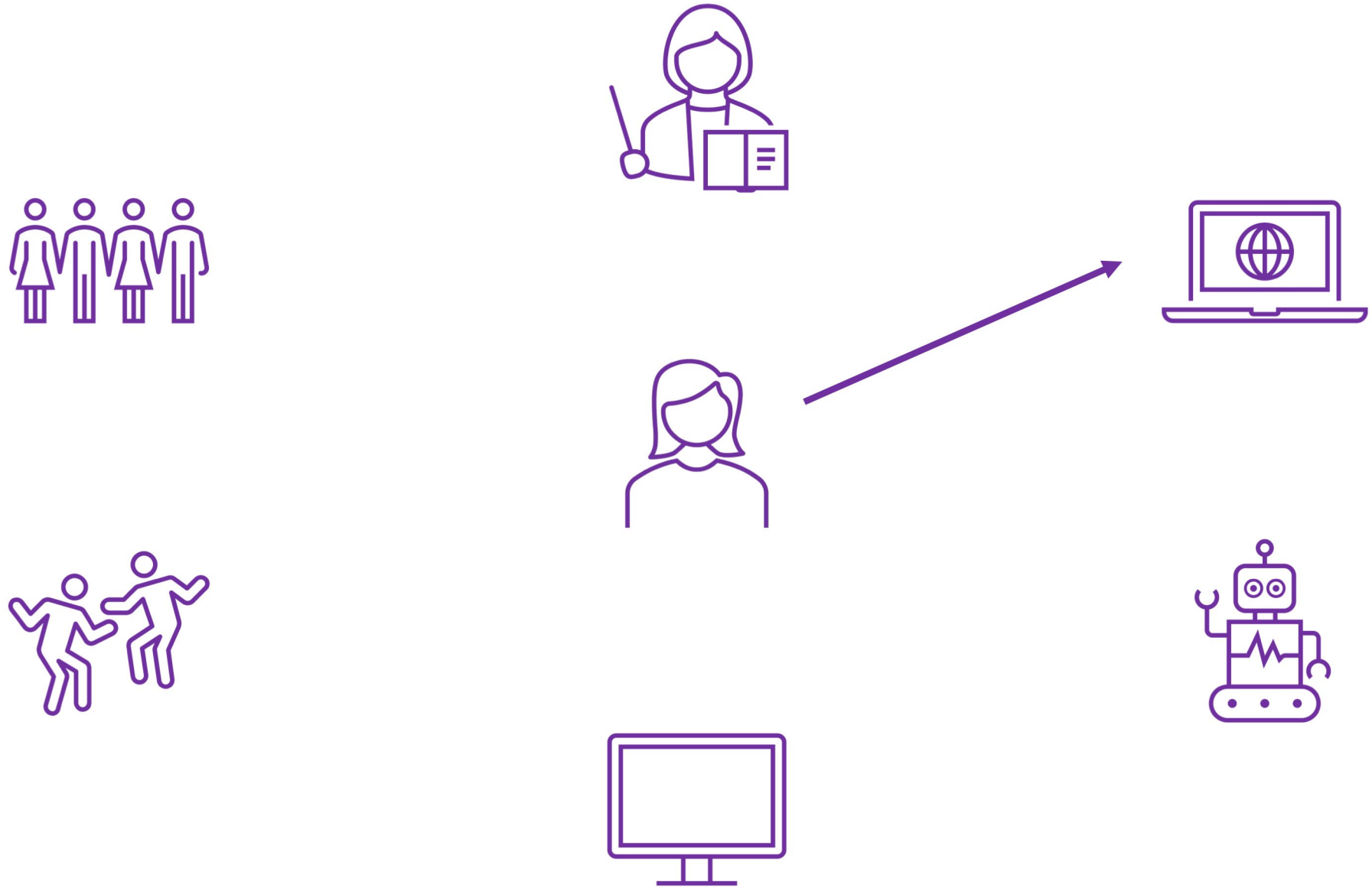


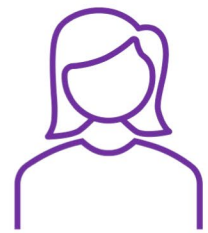


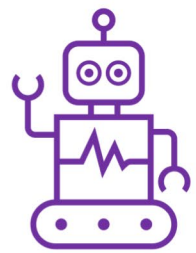


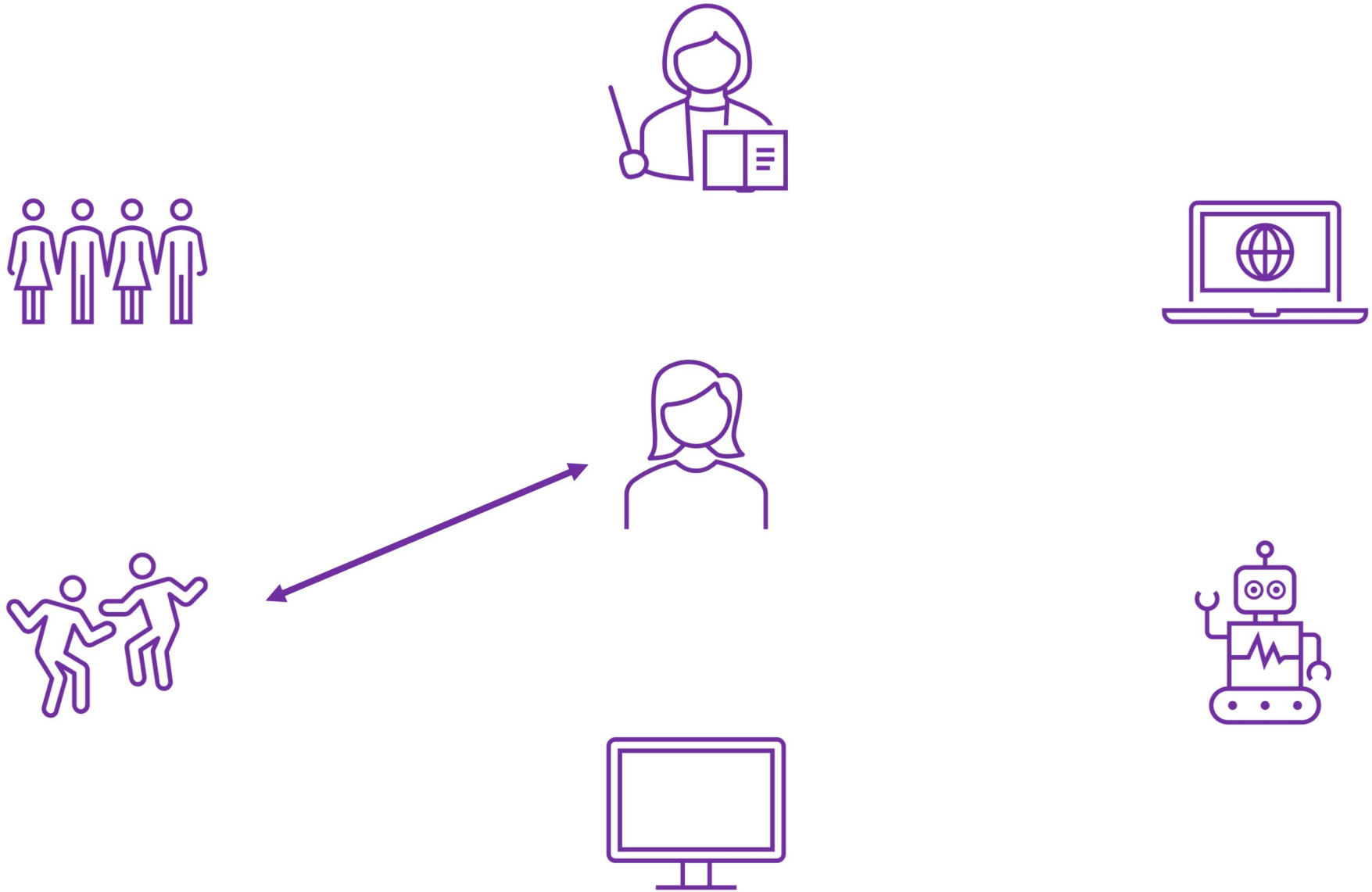












How to teach, learn and assess with AI

?

The chronic problem

Content knowledge

The jagged edge

FUTURE TENSE →

FULL EPISODE

Architecture's AI crossroads

Broadcast Sun 22 Oct 2023 at 12:30pm

Advanced Artificial Intelligence and new digital technologies are revolutionising the architectural industry.

AI literacy?

Enabling AI

Know and understand AI

Use and apply AI

Evaluate and create AI

AI ethics

Southworth et al. (2023). Developing a model for AI Across the curriculum: Transforming the higher education landscape via innovation in AI literacy. *Computers and Education: Artificial Intelligence.*

Curiosity – innate to humans, but can be suppressed by an overly regimented education

Connection – core to our needs as humans

Community – an expression of connection and essential to social learning

Care – between teachers and students, teachers and teachers, and students and students

Compassion – an expression of care and a positive learning community

Conflict – a necessary part of the human condition and of learning

Choice – a fundamental human right

Creativity?

Critical thinking?

	Humans	Robots
Interpretation		
Analysis		
Evaluation		
Inference		
Explanation		
Self-regulation		

	Humans	Robots
Interpretation		
Analysis		
Evaluation		
Inference		
Explanation		
Self-regulation		
	0	1

	Humans	Robots
Interpretation		🤖
Analysis		🤖
Evaluation		
Inference		
Explanation		
Self-regulation		
	0	2

	Humans	Robots
Interpretation		🤖
Analysis		🤖
Evaluation	🧠	
Inference		
Explanation		
Self-regulation		

1 2

	Humans	Robots
Interpretation		🤖
Analysis		🤖
Evaluation	🧠	
Inference	🧠	
Explanation		
Self-regulation		
	2	2

	Humans	Robots
Interpretation		🤖
Analysis		🤖
Evaluation	🧠	
Inference	🧠	
Explanation		🤖
Self-regulation		

2 3

	Humans	Robots
Interpretation		🤖
Analysis		🤖
Evaluation	🧠	
Inference	🧠	
Explanation		🤖
Self-regulation	🧠	
	3	3

Evaluation/judgement

Sensemaking

Self-regulated learning

(motivation and emotion)

Four Es of cognition

Embodied

Enacted

Embedded

Extended

We can’t expect students to make the most of learning with and using AI if they don’t understand themselves and other people

Knowing things

Knowing how I know things

Knowing how to use that knowledge meaningfully in a human, social world

Thank you

Jason M. Lodge, PhD, PFHEA
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Faculty of Humanities, Arts and Social Sciences
The University of Queensland

The University Of Queensland
AUSTRALIA
CREATE CHANGE

Maximizing AI's Potential in Education

Harnessing Strengths, Mitigating Challenges

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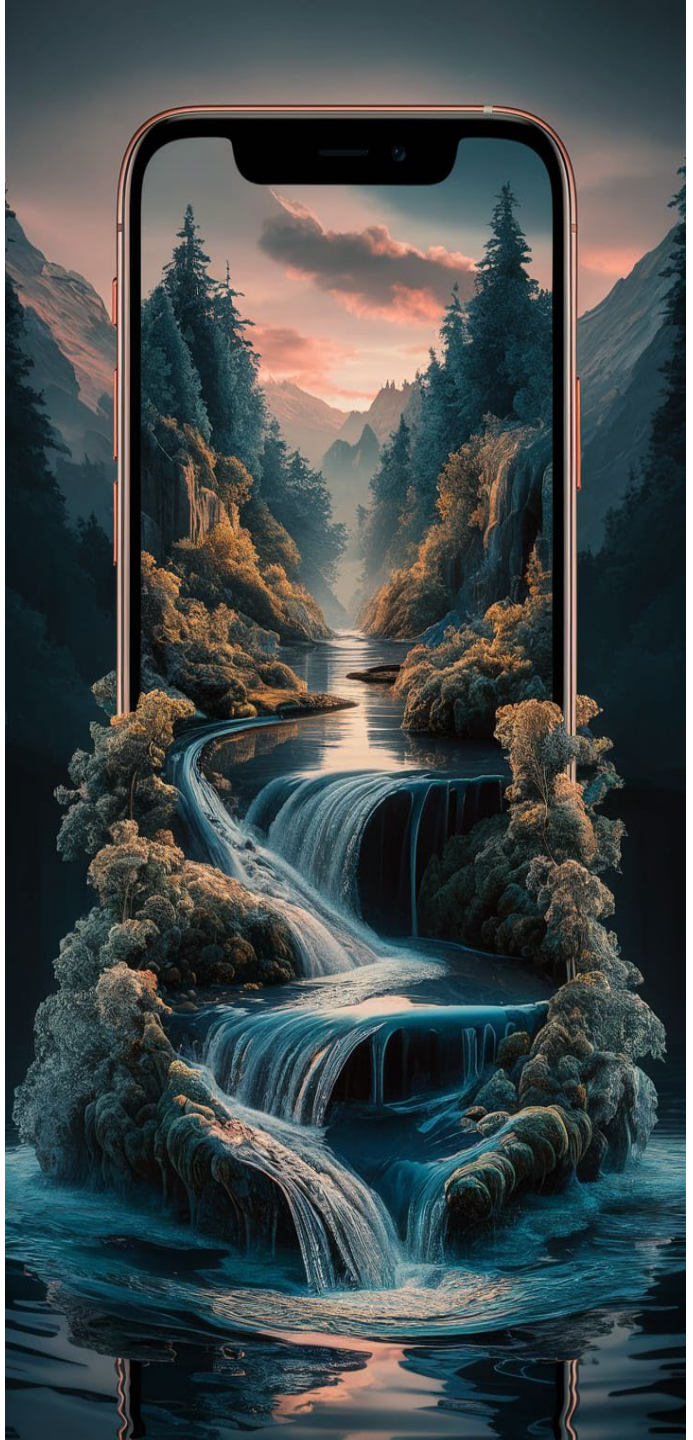
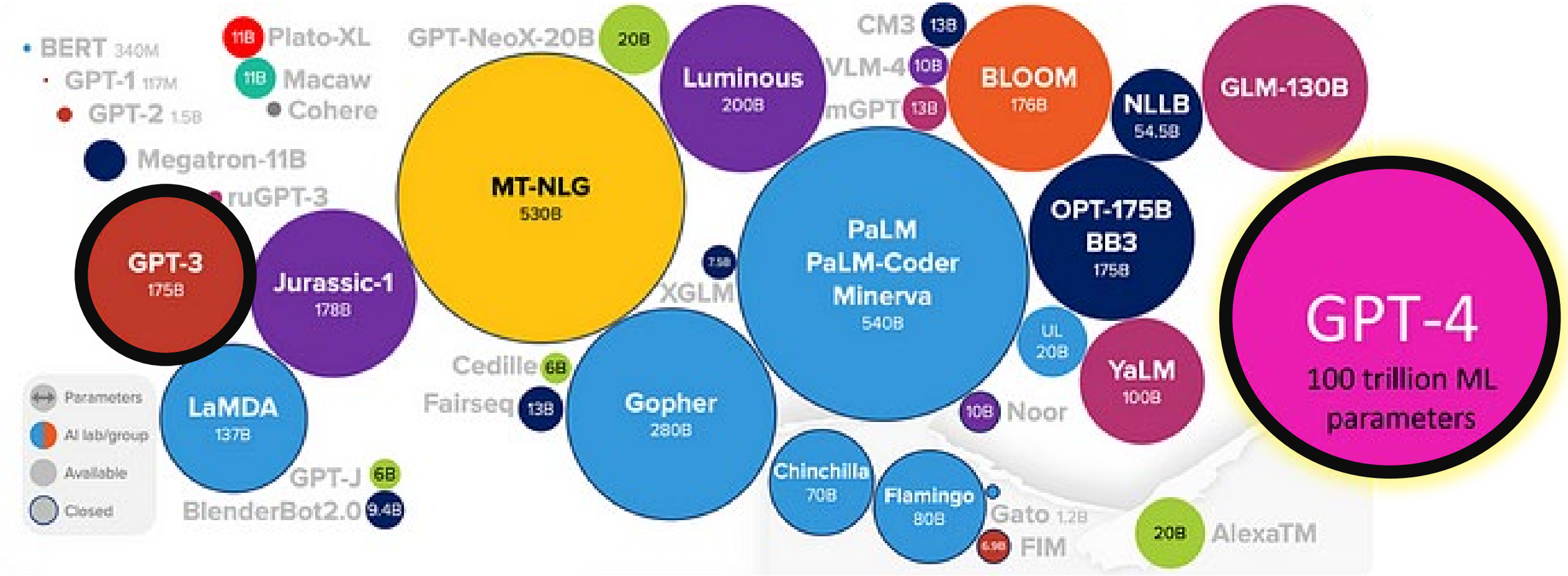
Generative AI

Leverages machine learning techniques to generate new content in various forms such as images, text and music from given input.

Large Language models

Large language models are advanced AI systems that have been trained on a vast amount of text data. They can generate human-like text and responses.



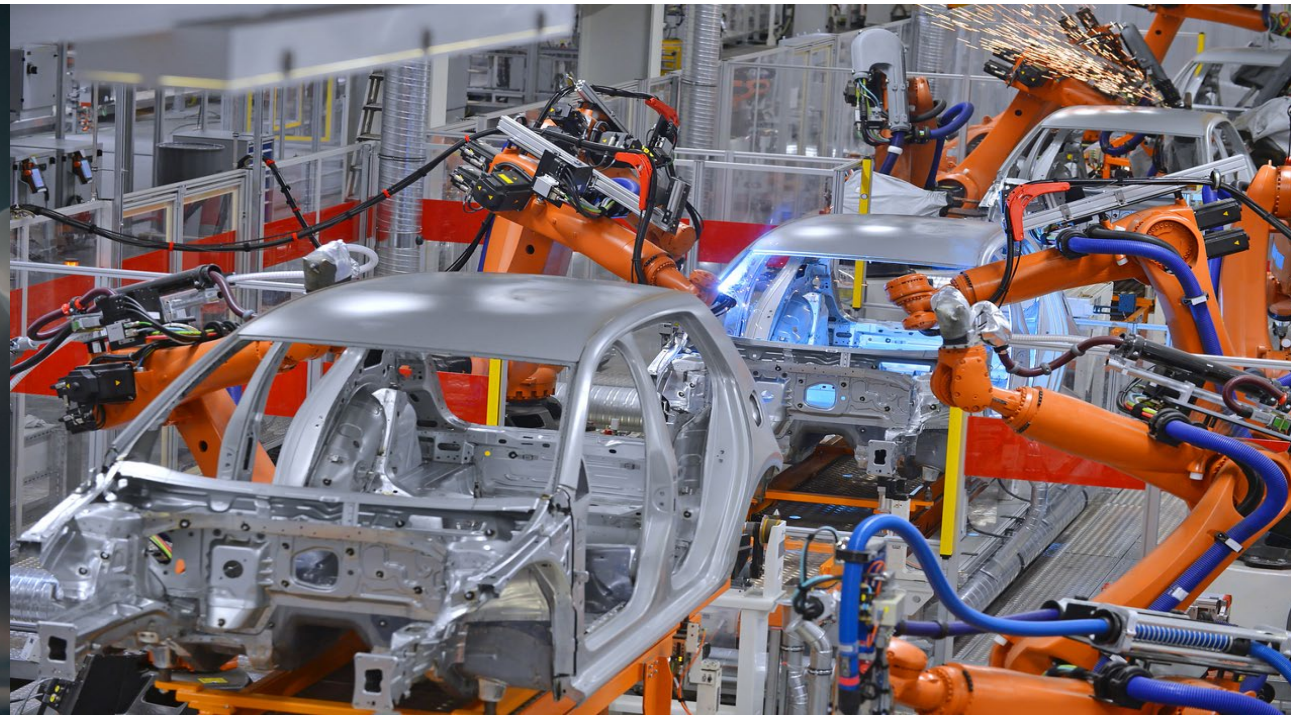
Source: https://ai.plainenglish.io/the-challenges-associated-with-building-products-using-large-language-models-llms-a0573dcfdf5f

Unpacking the Excitement Around Generative AI

Artificial Narrow Intelligence (ANI): Designed to perform a narrowly defined set of structured task. ANI has been successfully implemented in numerous fields.

IBM's Deep Blue beat world chess champion Garry Kasparov in the 1997 match

200 to 300 robots are dedicated to manufacturing of a car.

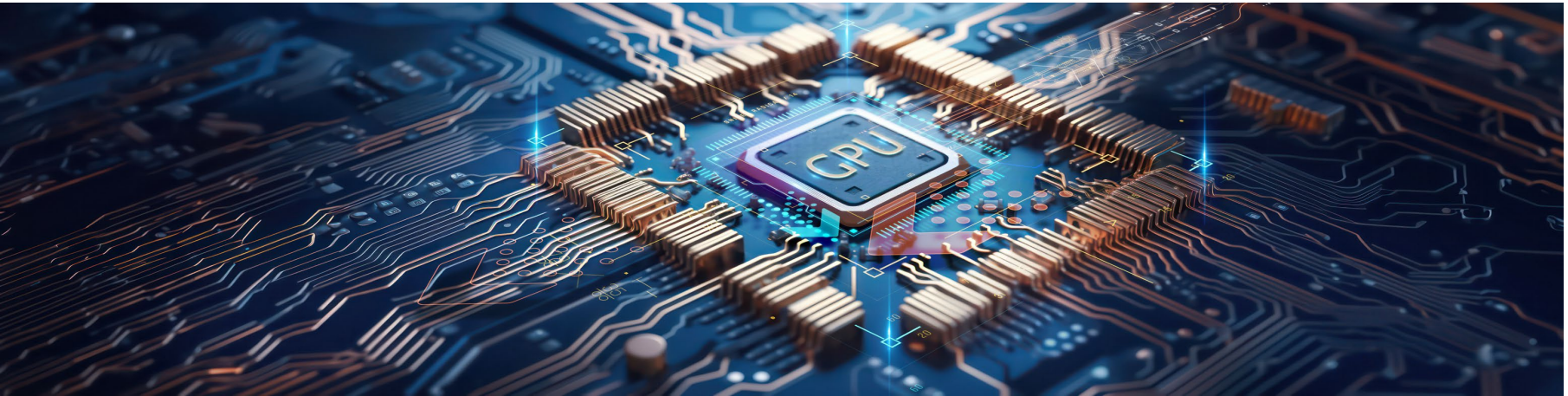


Impact of ANI on the job market

Unpacking the Excitement Around Generative AI

Artificial General Intelligence (AGI): Designed to perform across intellectual tasks similar to humans. Generative AI models represent our most significant progress towards achieving AGI.

Impact of AGI on the job market



- A human reading 24/7 for an entire lifetime consumes 8 billion words
- AI absorbs the same 8 billion words in about an hour.

- The rise of interactive digital personas and companions
- Increasingly knowledgeable, kind, emotionally intelligent, and multilingual.
- Always available, performing actions on behalf of owners.

- How would AI impact Education?
- How can we maximize potentials while mitigating concerns?
- What skills will be essential for us to learn (onloading)?
- Which tasks should we offload to AI?

AI in Education: A Double-Edged Sword

The increasing integration of AI into our everyday lives and education brings both opportunities and challenges.

- How can AI enhance teaching and improve student learning?
- How might AI negatively impact teaching and hinder student learning?

Participant responses

How can AI enhance teaching and improve student learning?

- Intervention tool for student learning e.g. help them out of the research “dip”
- Teachers using it to generate ideas to better explain tricky concepts
- Individual personalised feedback to students
- Conversational explanations backed by sources (sometimes)
- Equality in feedback
- Tutoring
- Breach language barriers
- Individualised learning systems
- Extension
- Save time for teachers - more productive in differentiation
- Much larger data set at fingertips
- Developing independent learning skills in students
- Generating options in problem solving
- Generating new ideas
- Explore different perspectives
- Instant gratification
- Provide specific guidance to assist with individual student needs
- Differentiation

Participant responses

How can AI enhance teaching and improve student learning?

- Save teacher time and increase efficiencies
- Reduce burnout / staff turnover
- Lessen the paperwork planning burden and allow for pedagogical focus
- Students asking questions without fear
- Student tutoring
- More engaging lessons
- Workshopping gaps in learning
- Huge potential to lose the importance of the process of learning rather than the outcome
- Reduce staff admins
- Formative assessment -setting/feedback
- Differentiation
- Supporting teachers with resource development
- Reduced critical thinking
- Promote laziness
- Inaccuracy
- Differentiation
- Better and exciting resources presented better for individuals

Participant responses

How can AI enhance teaching and improve student learning?

- Limit thinking before answers found
- More effective ways of working
- Save admin time
- Formative feedback of whole class
- Brainstorming

Participant responses

How might AI negatively impact teaching and hinder student learning?

- Dunning–Kruger effect
- AI doing the work for students / hindering student learning Educatas they lack connections
- Take shortcuts to bypass deep learning
- Distorted reality
- Illusion of accuracy
- Reduction in relational capabilities
- A barrier between people- isolation
- Enable laziness in both teachers and students
- Who to believe
- Trustworthiness of the information - fighting misinformation online
- Introduce or use wrong information without the user/s knowing
- Does not provide accurate quotations from texts
- Promote laziness
- Regurgitating effect
- Students generate assignments without really understanding what they have produced
- Hallucination without critical thought
- Accuracy of results
- Hinder student's ability to question effectively
- Students are passive learners

AI in Education: A Double-Edged Sword – The Positives

Personalised Tutor: Offers one-on-one support and explanations.

Virtual Teaching Assistant: Handles administrative tasks and routine queries.

Personalised learning: Tailors learning experiences based on individual needs.

Enhanced Accessibility: Improves access by enabling seamless translation between audio, visual, and text-based content.

AI in Education: A Double-Edged Sword – The Negatives

Academic Misconduct: AI can facilitate plagiarism and misuse

Hallucinations & Algorithm Bias: AI can produce inaccurate outputs or biased outputs

Data Privacy: Raises concerns about the security of student data.

Over-Reliance: May reduce human interaction and critical thinking.

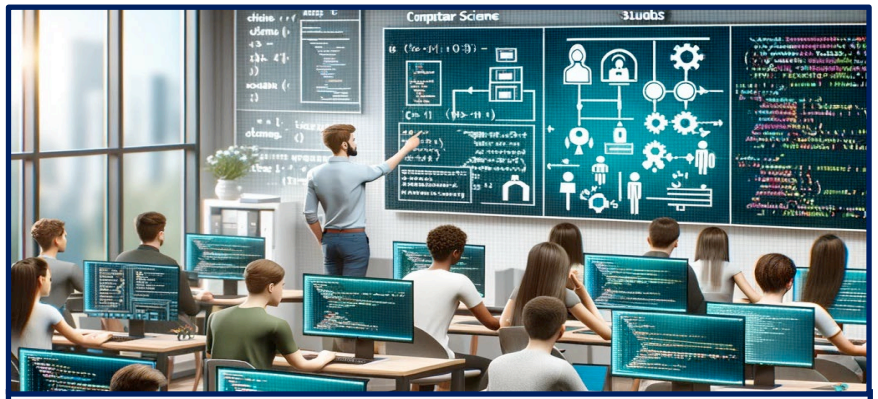
Harnessing Strengths, Mitigating Challenges

Education Despite AI

Empowering human potential in the age of automation

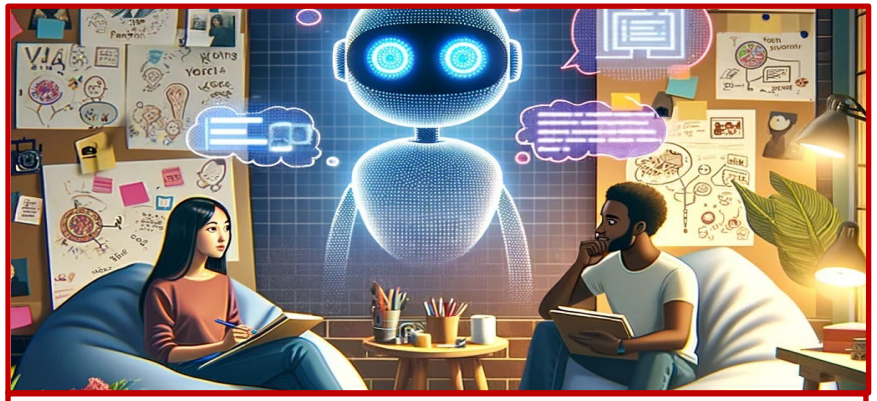
Education with AI

Harnessing AI for enhanced learning experiences



Education of AI

Developing curriculums for responsible use of AI



Education for AI

Equipping learners to work and live with AI

Learning Despite AI

While AI tools are becoming increasingly powerful, having a strong foundation in disciplinary knowledge remains critical for individuals.

- Advance Research & Technological Innovation
- Prevent AI Misconceptions
- Avoid Overreliance on AI
- Promote AI Ethics and Accountability

Future of Learning

Though foundational knowledge remains essential, how we engage with it will evolve.

- **Learning Content** will become more adaptive, interdisciplinary, and skills-focused to stay relevant.
- **Learning spaces** will shift to hybrid environments, blending physical and virtual elements for flexibility.
- **Learning practices** will become personalised, AI-driven, fostering critical thinking and engagement.
- **Learning Technologies** will create immersive, interactive experiences, simplifying complex concepts.

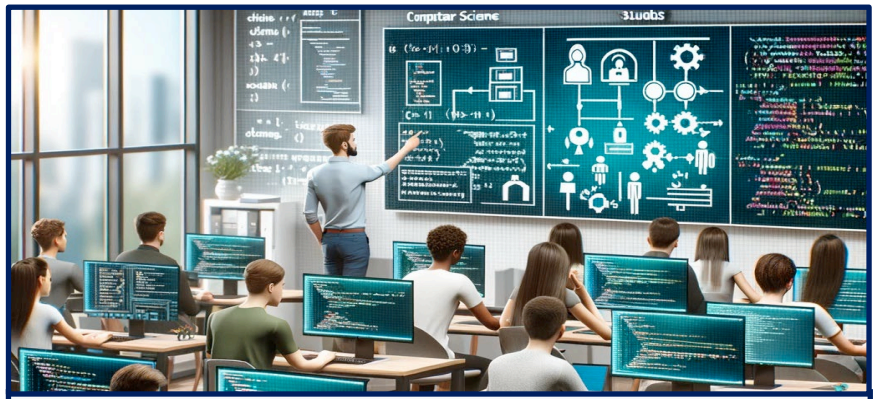
Harnessing Strengths, Mitigating Challenges

Education Despite AI

Empowering human potential in the age of automation

Education with AI

Harnessing AI for enhanced learning experiences



Education of AI

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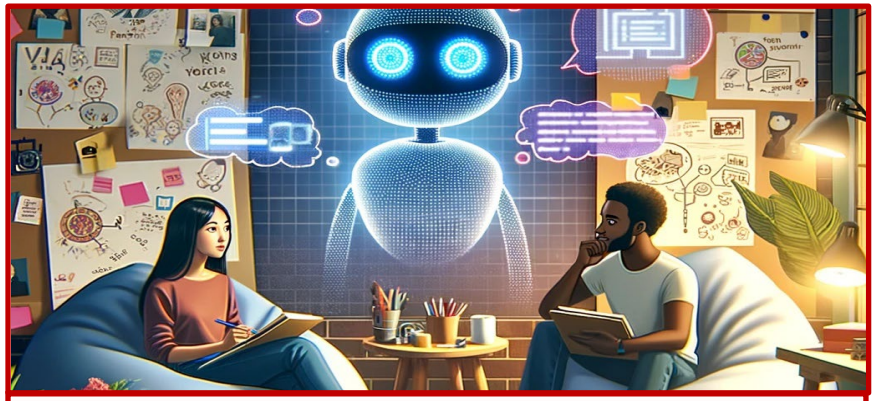


Education for AI

Equipping learners to work and live with AI

Innovate in an Instant: Creating the Perfect Educational Tool

Imagine you had the opportunity to instantly create a new educational tool to enhance your teaching practice or improve student learning. What would you create?

- **Identify the Purpose**: What specific challenge or need does this tool address in your teaching or your students' learning experience?
- **Tool Design**: Describe the key features and functionality of your educational tool. How will it work? What resources or technologies would it leverage?
- **Impact**: Why is this tool important? How do you envision it positively impacting student learning or engagement?

Participant responses

What would you create?

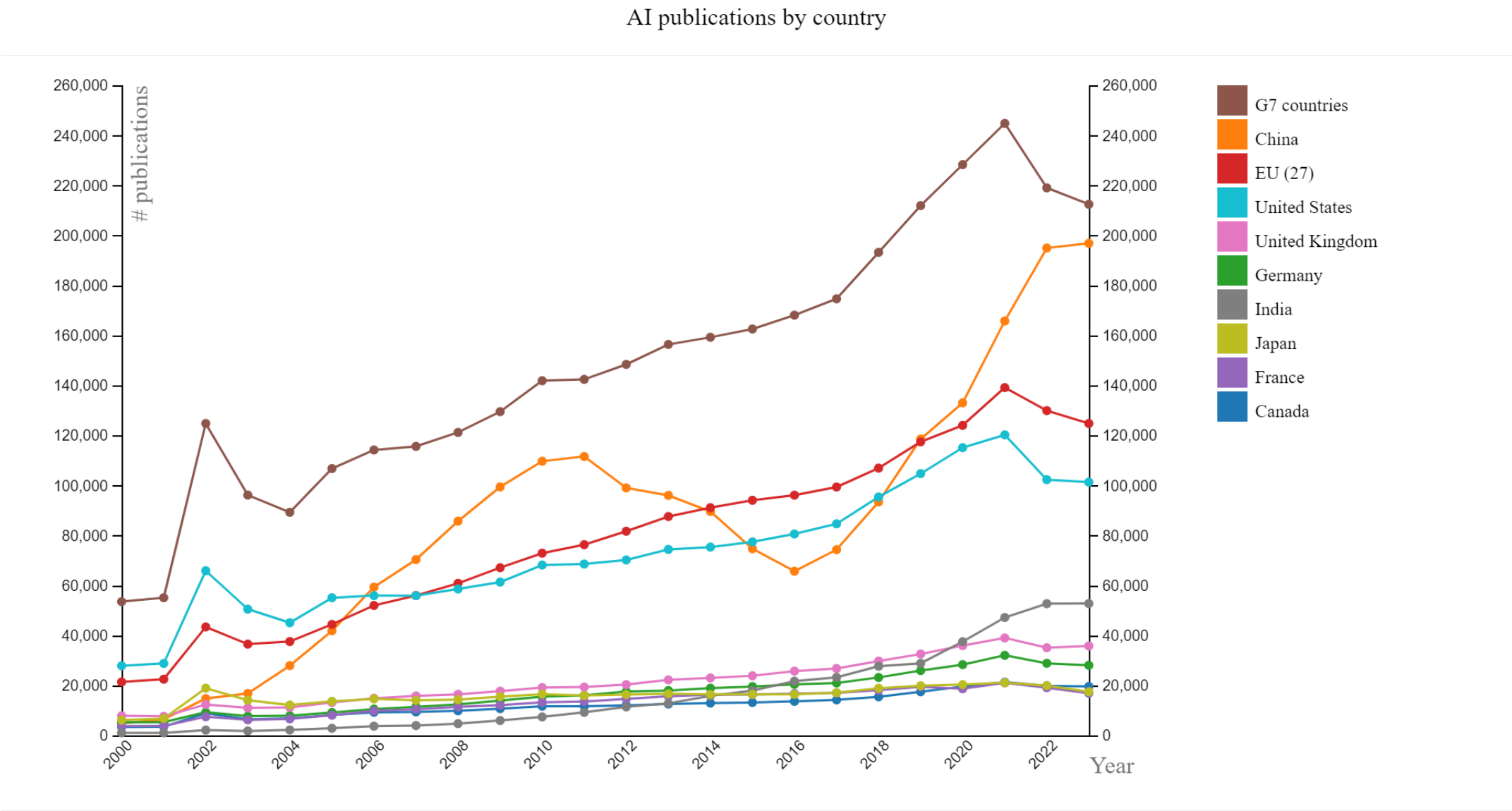
- A tool that takes all your students needs and challenges and creates individualised plans to achieve their best possible learning outcomes based on the knowledge they need to meet unit objectives
- A scaffolding tool that requires students to put answers/ideas in, and rather than create for them, the AI prompts the students with next step, and gives feedback at each step.
- 1:1 virtual tutor who could use school/teacher provided resources, provide a personalised learning plan, formative assessment and feedback. Coaching on summative assessment
- A tool that supports production of feedback… feedback for continuous reporting that comments and guides students through rubrics.
- Learning how to collaborate to solve collective problems
- A tool that provides instant formative feedback and automatically assigns formative tasks based on student data
- Personalised bot that monitors learning of content skills and personal capabilities…and provides personal upskilling.
- Self-reflective prompter to challenge students in considering their engagement, effort, skill level, etc. And help them identify their next steps to improve.

Participant responses

What would you create?

- A “curiosity tool’ that gives the framework to explore a topic or problem in depth
- Something to help students take the answers and make them their own..
- A student-specific differentiated learning platform for planning and assessment
- Delivery of content , specific to the syllabus, in both an audio and visual mode. The students could then questions the tool throughout to further explain aspects.
- Formative feedback bot on behalf of teachers
- Data analysis tool that reframes educational pathways for individualized learning.
- "Purpose: improve individual student learningWould understand students as an individual and student history.Available all hours and provide learning assistance but still pose learning challenges"
- An interactive videos that allow students to pause and ask questions and complete comprehension quizzes etc
- Program that tracks students' mastery of concept and provides tracks for learning based on the individual.
- Critical thinking
- Parent email replier

Increased Presence of AI Educational Research



Source: OECD.AI (2023), visualisations powered by JSI using data from OpenAlex., accessed on 17/9/2023, www.oecd.ai

REVIEW ARTICLE Open Access

A meta systematic review of artificial intelligence in higher education: a call for increased ethics, collaboration, and rigour

Melissa Bond[1,2,3*], Hassan Khosravi[4], Maarten De Laat[5], Nina Bergdahl[6,7], Violeta Negrea[3], Emily Oxley[3], Phuong Pham[5], Sin Wang Chong[3,8] and George Siemens[5]

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[3] National Institute of Teaching, London, UK
[4] Institute for Teaching and Learning Innovation, The

Abstract

Although the field of Artificial Intelligence in Education (AIEd) has a substantial history as a research domain, never before has the rapid evolution of AI applications in education sparked such prominent public discourse. Given the already rapidly growing AIEd literature base in higher education, now is the time to ensure that the field has a solid research and conceptual grounding. This review of reviews is the first comprehensive meta review to explore the scope and nature of AIEd in higher education (AIHEd) research, by synthesising secondary research (e.g., systematic reviews),

A meta systematic review of artificial intelligence in higher education: a call for increased ethics, collaboration, and rigour

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Overview. The paper aims to establish a foundational understanding of AI in higher education (AIHEd) by synthesizing secondary research to explore its scope, identify gaps, and guide future research.

Method. Via a comprehensive systematic literature review, we identified 66 evidence syntheses like systematic reviews and meta-analyses, which explored the application of AIHEd from 2018 to July 2023.

A meta systematic review of artificial intelligence in higher education: a call for increased ethics, collaboration, and rigour

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Key Findings.

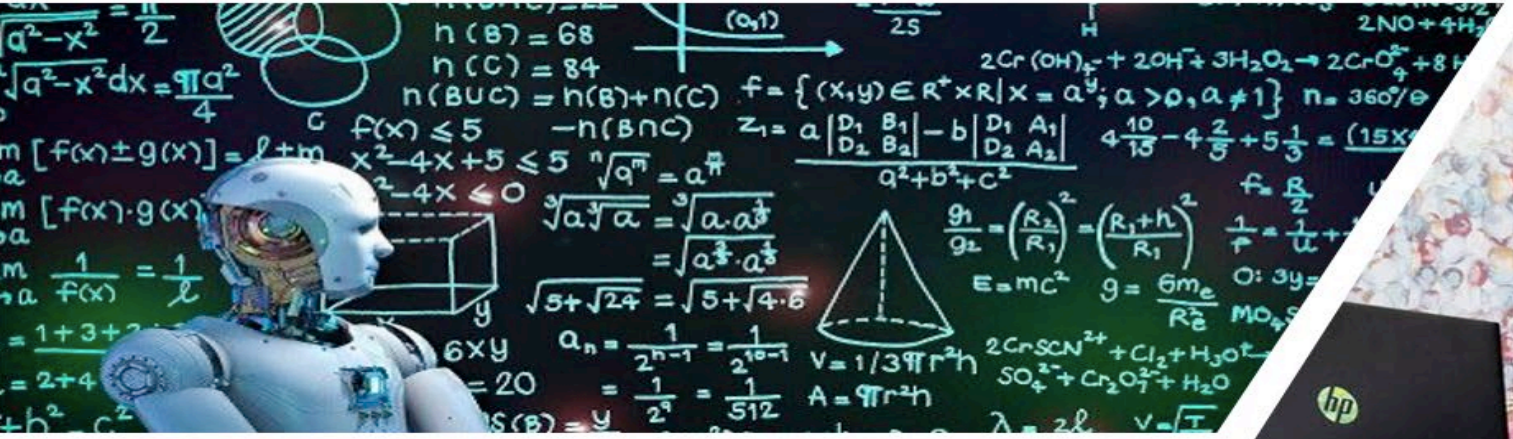
- **The top five benefits** of AIHEd include personalized learning, improved insights into student understanding, enhanced learning outcomes, reduced educator workload, and increased educational equity with precise assessments and feedback

- **The top five challenges** of AIHEd are ethical considerations, curriculum development, infrastructure, limited teacher technical knowledge, and concerns over authority shift from humans to AI.

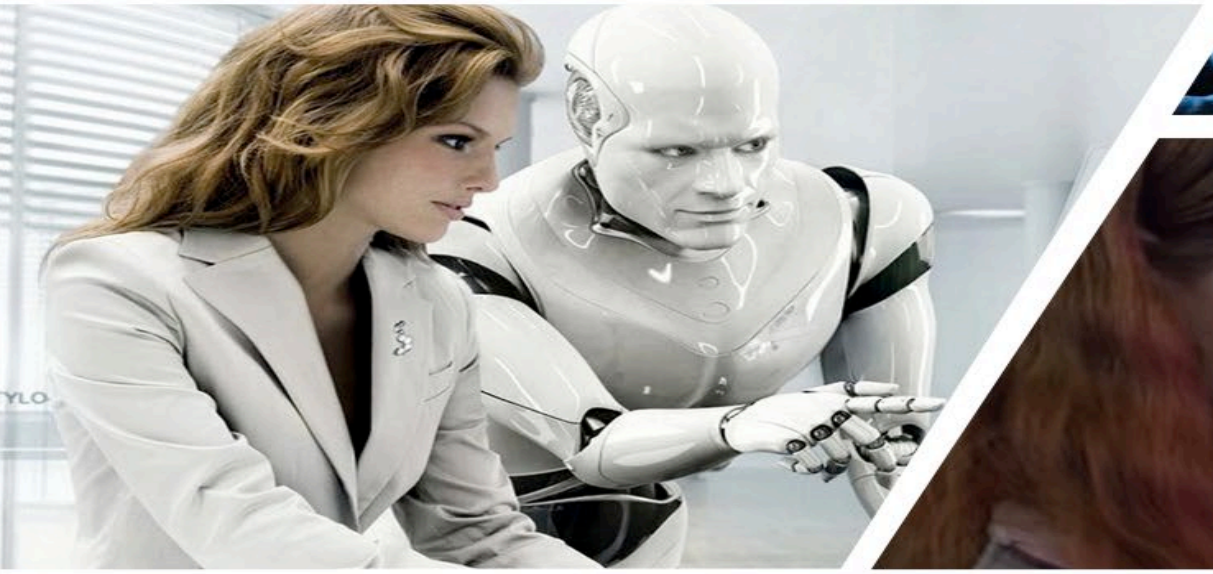
- There is a loud and resounding threefold call for **increased ethical practices**, cross-domain **collaboration**, and stringent **methodological rigor** to enhance the reliability and overall research quality of AIHEd research:

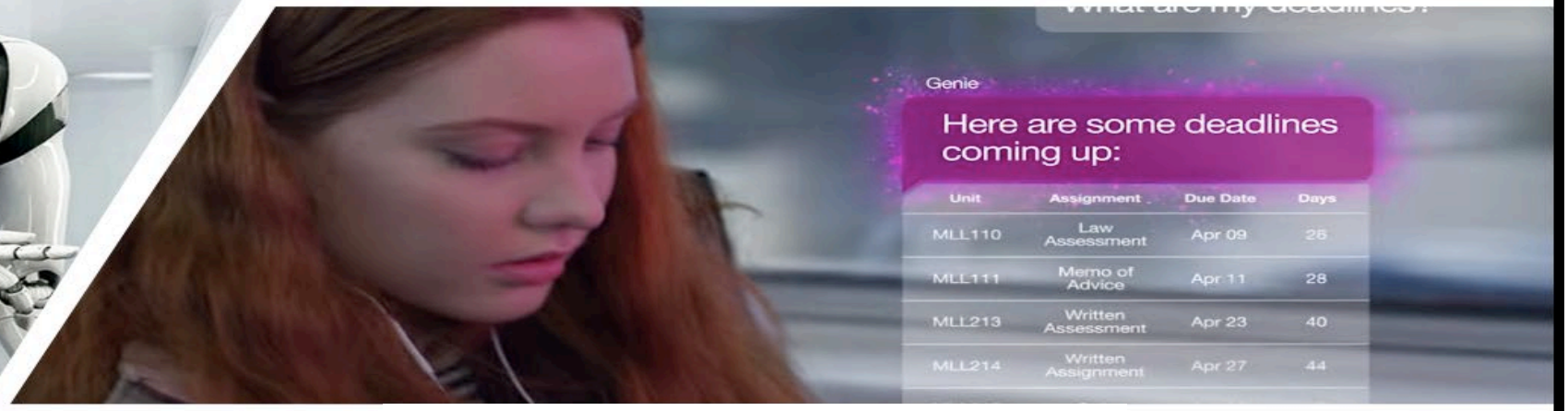
Learning with AI

AI in Instruction



AI in Assessment





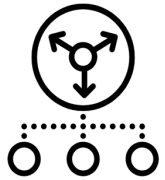
AI in Feedback

AI in Student Agency

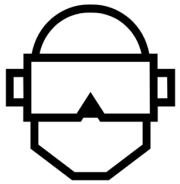
AI in Education Landscape – Pre GenAI

AI AND INSTRUCTION

Adaptive Learning



Immersive Learning



AI-assisted Content Creation

AI IN ASSESSMENT

Adaptive Testing

AI-Assisted Grading

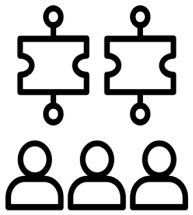
Plagiarism Detection & Automated Proctoring

AI IN FEEDBACK

Automated Feedback

Predictive Analytics

AI-Assisted Collaborative Learning

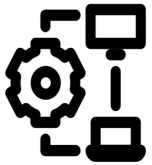


AI IN STUDENT AGENCY

Learner Models & Profiles

Personalised nudges

Recommender systems



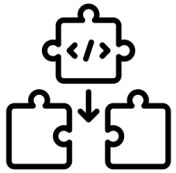
ChatGPT Common Uses in Education

Writing Essays

Writing lesson plans

Writing learning objectives

Designing class syllabus



Step-by-step solutions

Creating assessment items

Designing rubrics

Writing video scripts

Drafting emails

Thoughts and examples by Torrey Trust, Ph.D, University of Massachusetts Amherst

Contents lists available at ScienceDirect

Computers and Education: Artificial Intelligence

journal homepage: www.sciencedirect.com/journal/computers-and-education-artificial-intelligence

Large language models meet user interfaces: The case of provisioning feedback

Stanislav Pozdniakov [a,*], Jonathan Brazil [b], Solmaz Abdi [a], Aneesha Bakharia [a], Shazia Sadiq [a], Dragan Gašević [c], Paul Denny [d], Hassan Khosravi [a]

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[b] Institute for Teaching and Learning Innovation, The University of Queensland, St Lucia, QLD, 4072, Australia
[c] Centre for Learning Analytics, Faculty of Information Technology, Monash University, Melbourne, VIC, 3800, Australia
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[a] School of Electrical Engineering and Computer Science, The University of Queensland, St Lucia, QLD, 4072, Australia
[b] Institute for Teaching and Learning Innovation, The University of Queensland, St Lucia, QLD, 4072, Australia
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ARTICLE INFO

Keywords:
Artificial intelligence
Large language models
Generative artificial intelligence
Interfaces
Feedback
earning analytics

ABSTRACT

Incorporating Generative Artificial Intelligence (GenAI), especially Large Language Models (LLMs), into educational settings presents valuable opportunities to boost the efficiency of educators and enrich the learning experiences of students. A significant portion of the current use of LLMs by educators has involved using conversational user interfaces (CUIs), such as chat windows, for functions like generating educational materials or offering feedback to learners. The ability to engage in real-time conversations with LLMs, which can enhance educators' domain knowledge across various subjects, has been of high value. However, it also presents challenges to LLMs' widespread, ethical, and effective adoption. Firstly, educators must have a degree of expertise, including tool familiarity, AI literacy and prompting to effectively use CUIs, which can be a barrier to adoption. Secondly, the open-ended design of CUIs makes them exceptionally powerful, which raises ethical concerns, particularly when used for high-stakes decisions like grading. Additionally, there are risks related to privacy and intellectual property, stemming from the potential unauthorised sharing of sensitive information. Finally, CUIs are designed for short, synchronous interactions and often struggle and hallucinate when given complex, multi-step tasks (e.g., providing individual feedback based on a rubric on a large scale). To address these challenges, we explored the benefits of transitioning away from employing LLMs via CUIs to the creation of applications with user-friendly interfaces that leverage LLMs through API calls. We first propose a framework for pedagogically sound and ethically responsible incorporation of GenAI into educational tools, emphasizing a human-centred design. We then illustrate the application of our framework to the design and implementation of a novel tool called Feedback Copilot, which enables instructors to provide students with personalized qualitative feedback on their

Using GenAI via the open-ended design of conversational user interfaces such as ChatGPT introduces various challenges and concerns:

- Requires **AI literacy** and prompting expertise.
- Raises **ethical concerns** in **high-stakes decisions**.
- Risk of **unauthorized sharing** of sensitive data
- Best for brief interactions; **struggles with complex tasks**.

This paper presents A **framework** for transitioning from conversational user interfaces to more interactive and engaging interfaces using GenAI.

RiPPLE

Harnessing student wisdom to improve learning

As recognised by:

AUSTRALIAN AWARDS FOR UNIVERSITY TEACHING

EDUCAUSE

Holon IQ

Experts in the making: What does it take?

Personalised Learning

Customized learning based on your knowledge.

Experts in the making: What does it take?

Personalised Learning

Customized learning based on your knowledge.

Peer Learning

Connecting, learning and reviewing with peers.

Experts in the making: What does it take?

Personalised Learning

Customized learning based on your knowledge.

Peer Learning

Connecting, learning and reviewing with peers.

Higher Order Learning

Contributing to and advancing collective knowledge

Spreading RiPPLEs of Knowledge and Connecting Minds

Creation

Students craft study resources to enhance their content knowledge and understanding

Spreading RiPPLEs of Knowledge and Connecting Minds

Creation

Students craft study resources to enhance their content knowledge and understanding

Moderation

Peer evaluation of study resources ensures reliability of quality and deepens student learning

Spreading RiPPLEs of Knowledge and Connecting Minds

Creation

Students craft study resources to enhance their content knowledge and understanding

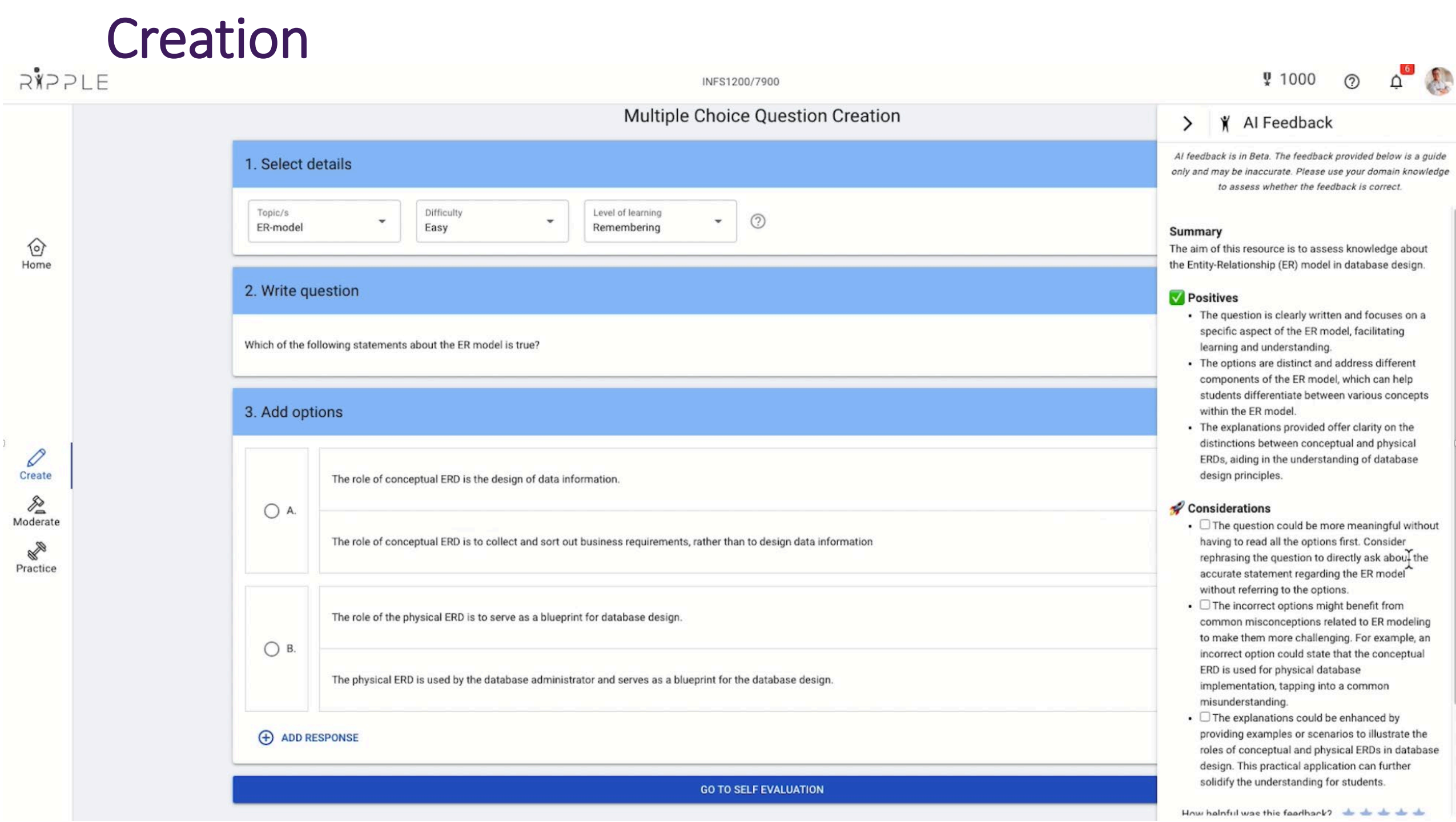
Moderation

Peer evaluation of study resources ensures reliability of quality and deepens student learning

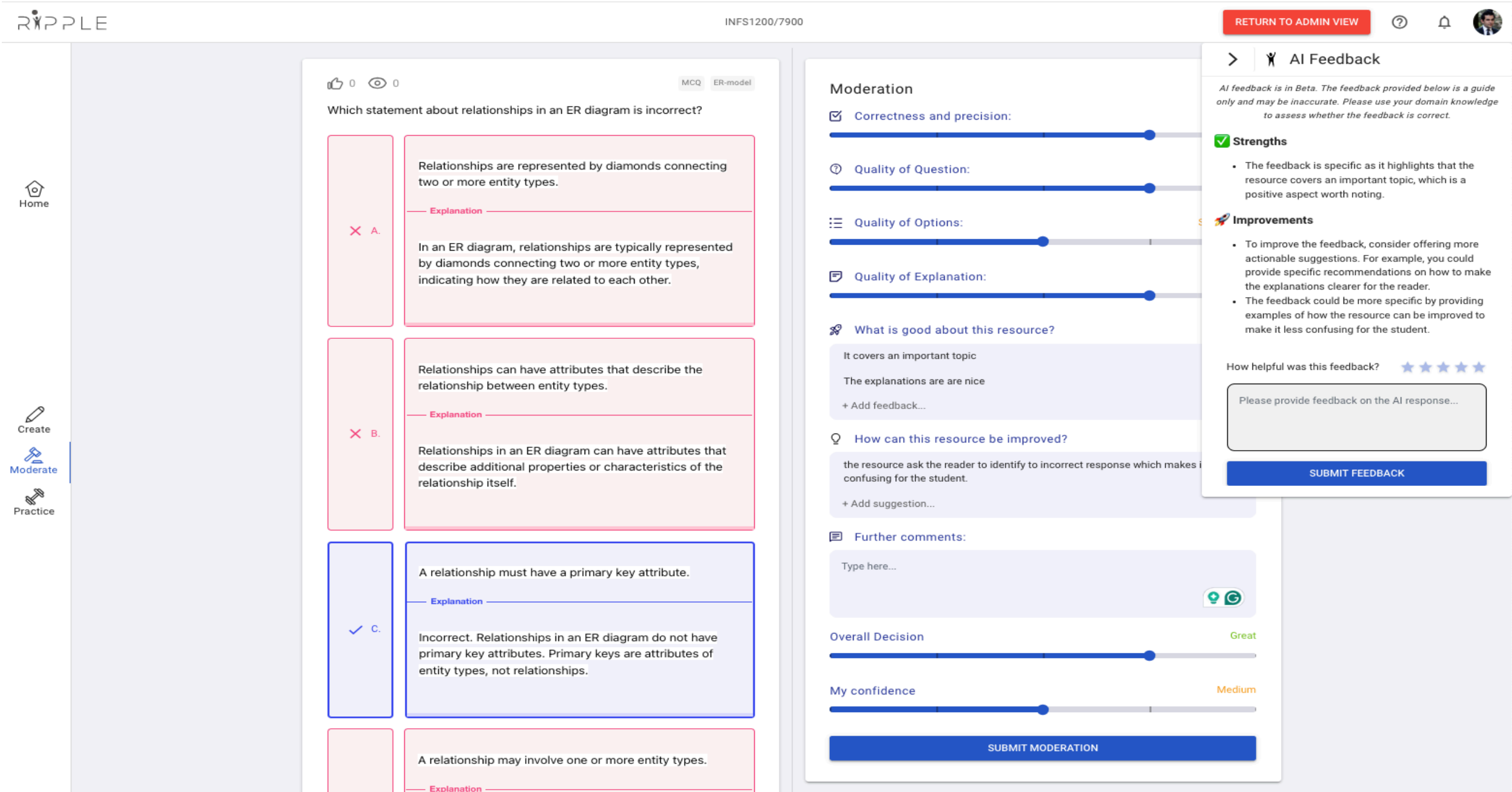
Recommendation

Students thrive as they engaged with personalised instructions that meet their learning needs

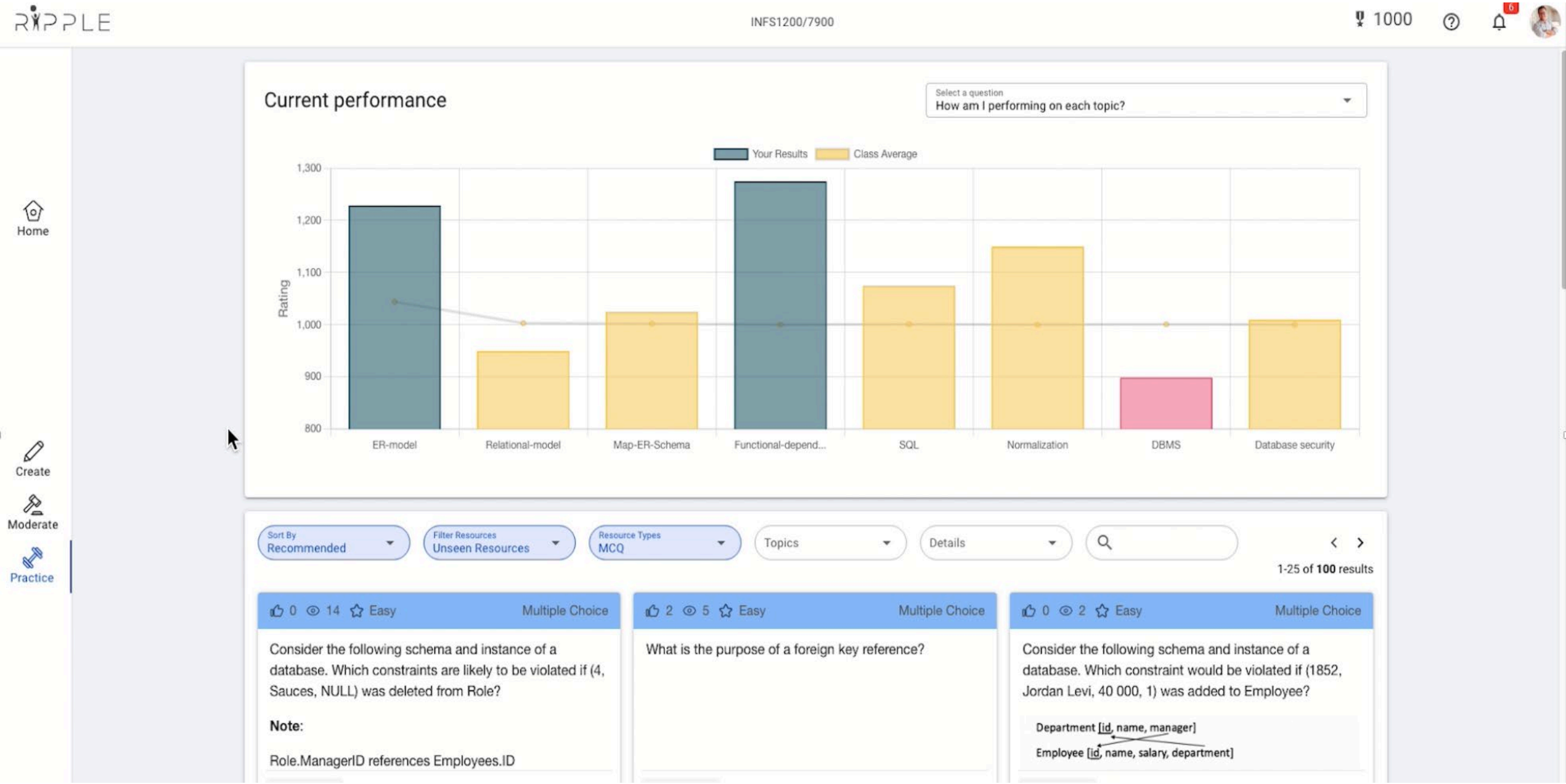
Creation


RIPPLE
INFS1200/7900
1000
Multiple Choice Question Creation
1. Select details
Topic/s
ER-model
Difficulty
Easy
Level of learning
Remembering
2. Write question
Which of the following statements about the ER model is true?
3. Add options
A.
The role of conceptual ERD is the design of data information.
The role of conceptual ERD is to collect and sort out business requirements, rather than to design data information
B.
The role of the physical ERD is to serve as a blueprint for database design.
The physical ERD is used by the database administrator and serves as a blueprint for the database design.
ADD RESPONSE
GO TO SELF EVALUATION
Home
Create
Moderate
Practice
AI Feedback
AI feedback is in Beta. The feedback provided below is a guide only and may be inaccurate. Please use your domain knowledge to assess whether the feedback is correct.
Summary
The aim of this resource is to assess knowledge about the Entity-Relationship (ER) model in database design.
Positives
The question is clearly written and focuses on a specific aspect of the ER model, facilitating learning and understanding.
The options are distinct and address different components of the ER model, which can help students differentiate between various concepts within the ER model.
The explanations provided offer clarity on the distinctions between conceptual and physical ERDs, aiding in the understanding of database design principles.
Considerations
The question could be more meaningful without having to read all the options first. Consider rephrasing the question to directly ask about the accurate statement regarding the ER model without referring to the options.
The incorrect options might benefit from common misconceptions related to ER modeling to make them more challenging. For example, an incorrect option could state that the conceptual ERD is used for physical database implementation, tapping into a common misunderstanding.
The explanations could be enhanced by providing examples or scenarios to illustrate the roles of conceptual and physical ERDs in database design. This practical application can further solidify the understanding for students.
How helpful was this feedback?

Moderation


RIPPLE
INFS1200/7900
RETURN TO ADMIN VIEW
Home
Create
Moderate
Practice
0
0
MCQ
ER-model
Which statement about relationships in an ER diagram is incorrect?
A.
Relationships are represented by diamonds connecting two or more entity types.
Explanation
In an ER diagram, relationships are typically represented by diamonds connecting two or more entity types, indicating how they are related to each other.
B.
Relationships can have attributes that describe the relationship between entity types.
Explanation
Relationships in an ER diagram can have attributes that describe additional properties or characteristics of the relationship itself.
C.
A relationship must have a primary key attribute.
Explanation
Incorrect. Relationships in an ER diagram do not have primary key attributes. Primary keys are attributes of entity types, not relationships.
A relationship may involve one or more entity types.
Explanation
Moderation
Correctness and precision:
Quality of Question:
Quality of Options:
Quality of Explanation:
What is good about this resource?
It covers an important topic
The explanations are are nice
+ Add feedback...
How can this resource be improved?
the resource ask the reader to identify to incorrect response which makes i
confusing for the student.
+ Add suggestion...
Further comments:
Type here...
Overall Decision
Great
My confidence
Medium
SUBMIT MODERATION
AI Feedback
AI feedback is in Beta. The feedback provided below is a guide only and may be inaccurate. Please use your domain knowledge to assess whether the feedback is correct.
Strengths
The feedback is specific as it highlights that the resource covers an important topic, which is a positive aspect worth noting.
Improvements
To improve the feedback, consider offering more actionable suggestions. For example, you could provide specific recommendations on how to make the explanations clearer for the reader.
The feedback could be more specific by providing examples of how the resource can be improved to make it less confusing for the student.
How helpful was this feedback?
Please provide feedback on the AI response...
SUBMIT FEEDBACK

Recommendation



RiPPLE is gaining momentum as we prepare for a global launch, building on years of success and recognition.

Implementation:

- Over 200 courses at UQ.
- More than 60,000 students impacted.

Research & benefits

- 30+ peer-reviewed articles.
- Increase student grades by 10%

Recognition

- National Citation for Excellence in Enhancing Student Learning
- UQ All-Staff Commendation for Innovation
- Finalist for the 2024 Queensland AI Research Award

IT MADE IT CLEAR THE KINDS OF THINGS I WAS STRUGGLING WITH

I have enjoyed rippling and evaluating my peers' ripples. I think Ripple is a great tool for learning and the questions have been very stimulating.

It was a great way to practice questions and engage with the cohort.

IT HELPED SOLIDIFY MY KNOWLEDGE. RIPPLE SHOULD BE USED IN THE FUTURE

I LOVED RIPPLE! IT REINFORCED MY UNDERSTANDING

It is a fantastic idea . It helped me throughout the semester.

Instructor Feedback

"I've been using RiPPLE in my large and medium sized courses with great learning outcomes & student satisfaction"

"I saw great benefits when using the platform, especially in the students' experience, and their learning."

"I loved that students could help write their own practice questions and share them with the class."

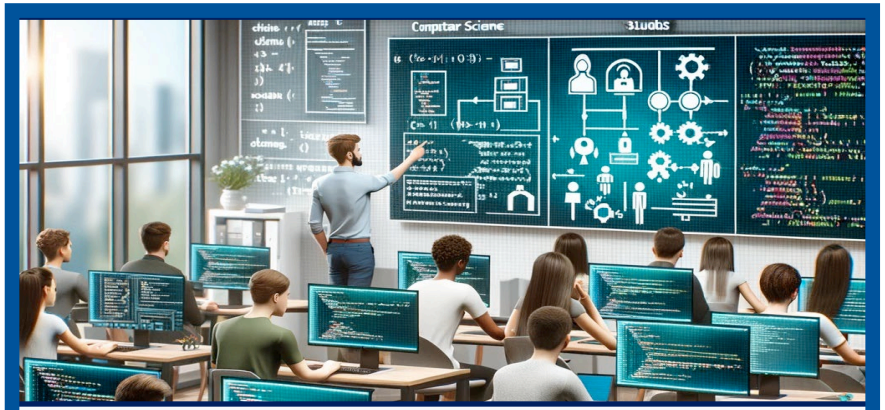
Harnessing Strengths, Mitigating Challenges

Education Despite AI

Empowering human potential in the age of automation

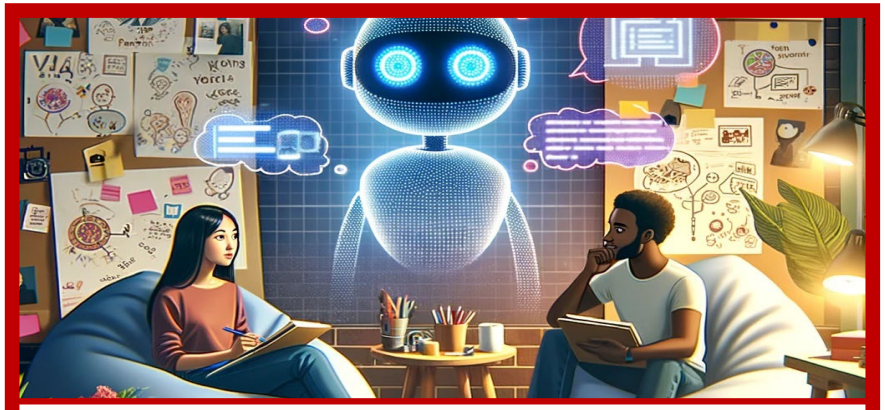
Education with AI

Harnessing AI for enhanced learning experiences



Education of AI

Developing curriculums for responsible use of AI



Education for AI

Equipping learners to work and live with AI

Adaptive Skills and Knowledge for the Age of AI

As AI rapidly transforms industries and everyday life, a critical skills and knowledge gap is emerging. To help bridge this gap, reflect on:

- What essential skills and knowledge do individuals need to effectively navigate AI-driven changes?
- How can educators and institutions better prepare students for a future where AI is integrated into most industries and sectors?

Participant responses

What essential skills and knowledge do individuals need to effectively navigate AI-driven changes?

- Resilience
- Asking effective questions
- Understanding what thinking is within a new model of learning
- Discernment
- Self knowledge of learning strategies
- Open -mindedness, curiosity
- Curiosity
- Basic literacy
- Critical thinking
- Critical thinking
- "Business / problem analysis techniquesQuestioning Critical thinking"
- Ethics/ morality
- Critical thinking
- Confidence in exploration
- Provided balanced curriculum that is knowledge-rich and taught alongside skills.
- Evaluative thinking
- Sam(r) get to Redesign
- Adaptive
- Persistence

Participant responses

How can educators and institutions better prepare students for a future where AI is integrated into most industries and sectors?

- Model effective use
- Understanding what it is and how it works
- Teach critical thinking and use of AI and allow teachers PD time
- Redesign the curriculum
- Develop curiosity to investigate potential, free there minds
- Minimise fear & prioritise 21st century skills so students are empowered to work with AI
- Teach the context first
- Teach it in context of a unit of work - inquiry model
- Developing a strong moral compass
- Explicit instruction
- Guidance
- Work on developing creative students who are self aware, self confident, of strong character and inherently curious.
- Focus more on processes and skills
- Guidance on how to use, when and when not
- Opportunities for practise
- Embrace metacognitive practices
- Appropriate assessment types
- Teachers who are trained in effective A.I. use
- Work with AI

ASK4AI

Proposal for an ARC Centre of Excellence for Adaptive Skills & Knowledge in the Age of AI

Crafting Brighter Futures, One Learner Success Story at a Time

Working Definition of ASK4AI

In a world where change is the only constant, **adaptability** is the key to thriving.

ASK4AI equips individuals with critical skills to navigate change, learn swiftly, and apply knowledge in dynamic environments:

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- **Hybrid Metacognition**: Thinking critically and adapting cognitive processes when using AI.
- **Life-long Learning**: Committing to continuous learning and upskilling in the face of rapid AI advancements.

Four Pillars of ASK4AI

Adaptive Skills and Knowledge: Builds frameworks for the skills needed to adapt to AI-driven changes, combining AI literacy, 21st-century skills, and human-AI interaction.

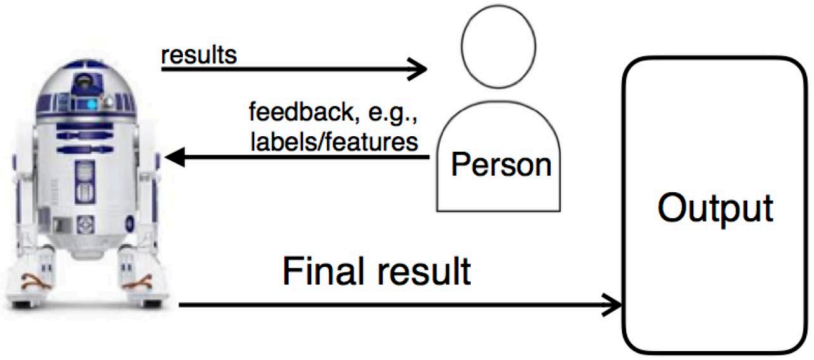
People: Focuses on how diverse groups develop and use adaptive skills in AI contexts, ensuring inclusivity and equity.

Practice: Identifies scalable practices to foster adaptive skills across different sectors and demographics.

Technology: Designs AI-powered systems to develop and assess adaptive skills, prioritizing ethical and responsible AI use.

Human-AI Teaming Framework

Human-in-the-loop



AI is in charge of decision making and humans may provide feedback or confirmation

Application: Automatic License Plate Recognition

Source: https://medium.com/@ChenhaoTan/human-centered-machine-learning-a-machine-in-the-loop-approach-ed024db34fe7#:~:text=Machine%2Din%2Dthe%2Dloop%20where%20humans%20take%20full%20agency,new%20paradigm%20for%20machine%20learning

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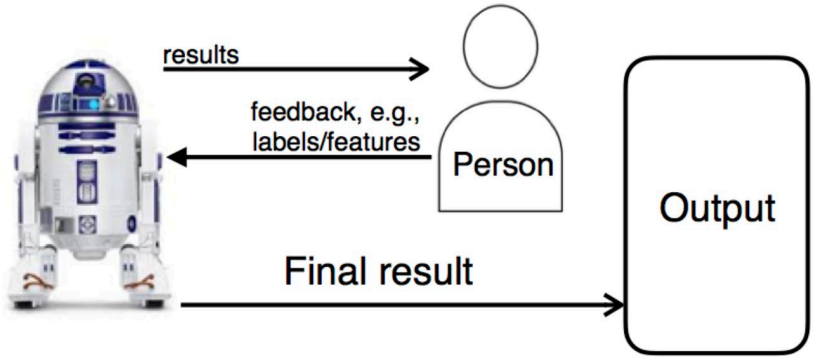

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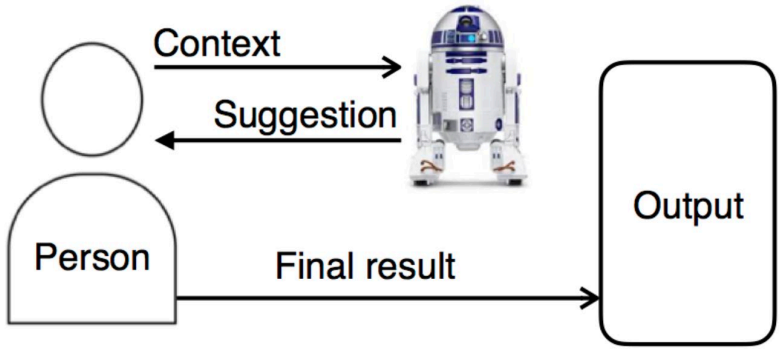

Humans take full agency and AI play a supporting role

Application: AI in Healthcare Diagnostics

How can AI in education applications benefit from these models?

Source: https://medium.com/@ChenhaoTan/human-centered-machine-learning-a-machine-in-the-loop-approach-ed024db34fe7#:~:text=Machine%2Din%2Dthe%2Dloop%20where%20humans%20take%20full%20agency,new%20paradigm%20for%20machine%20learning

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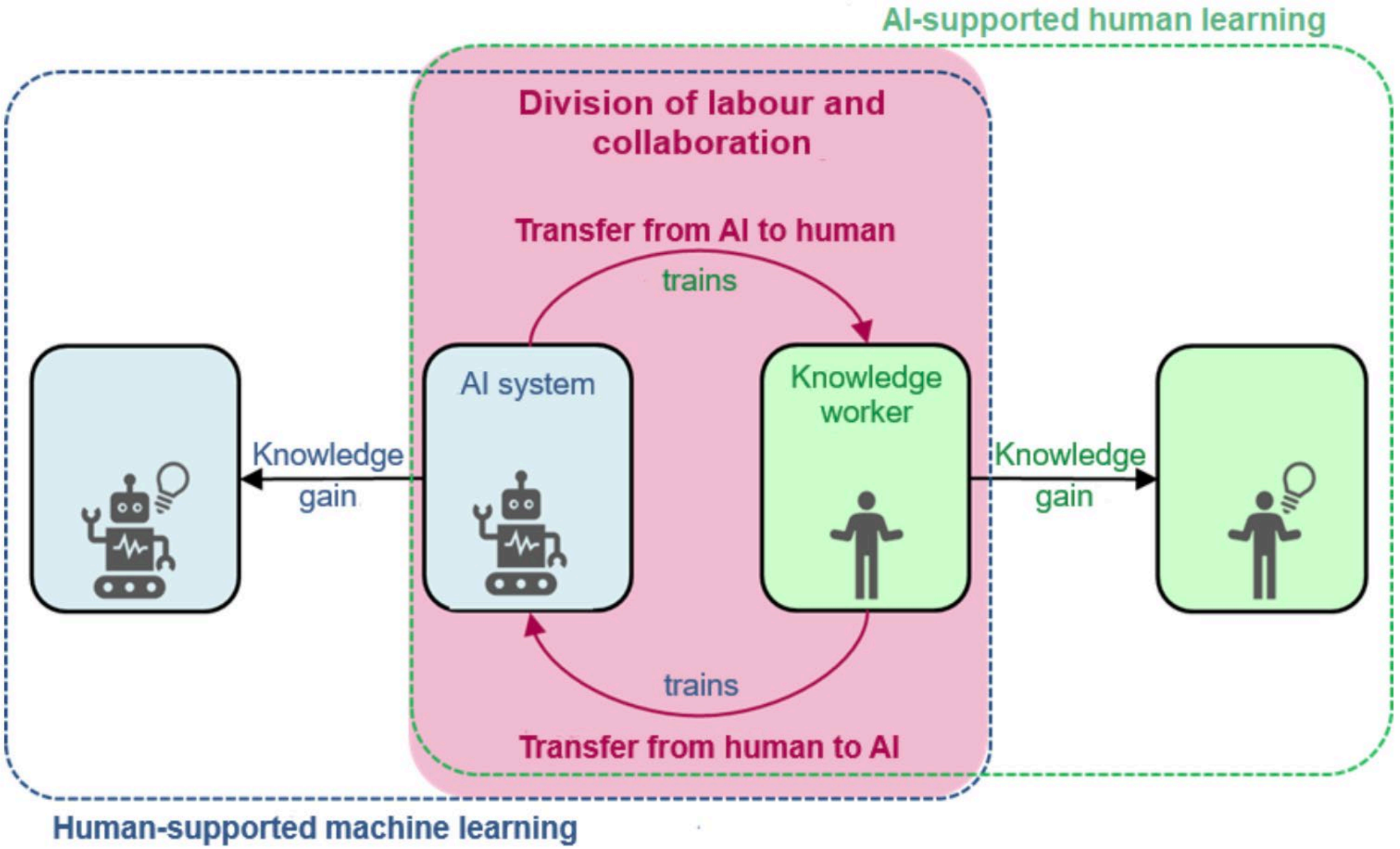
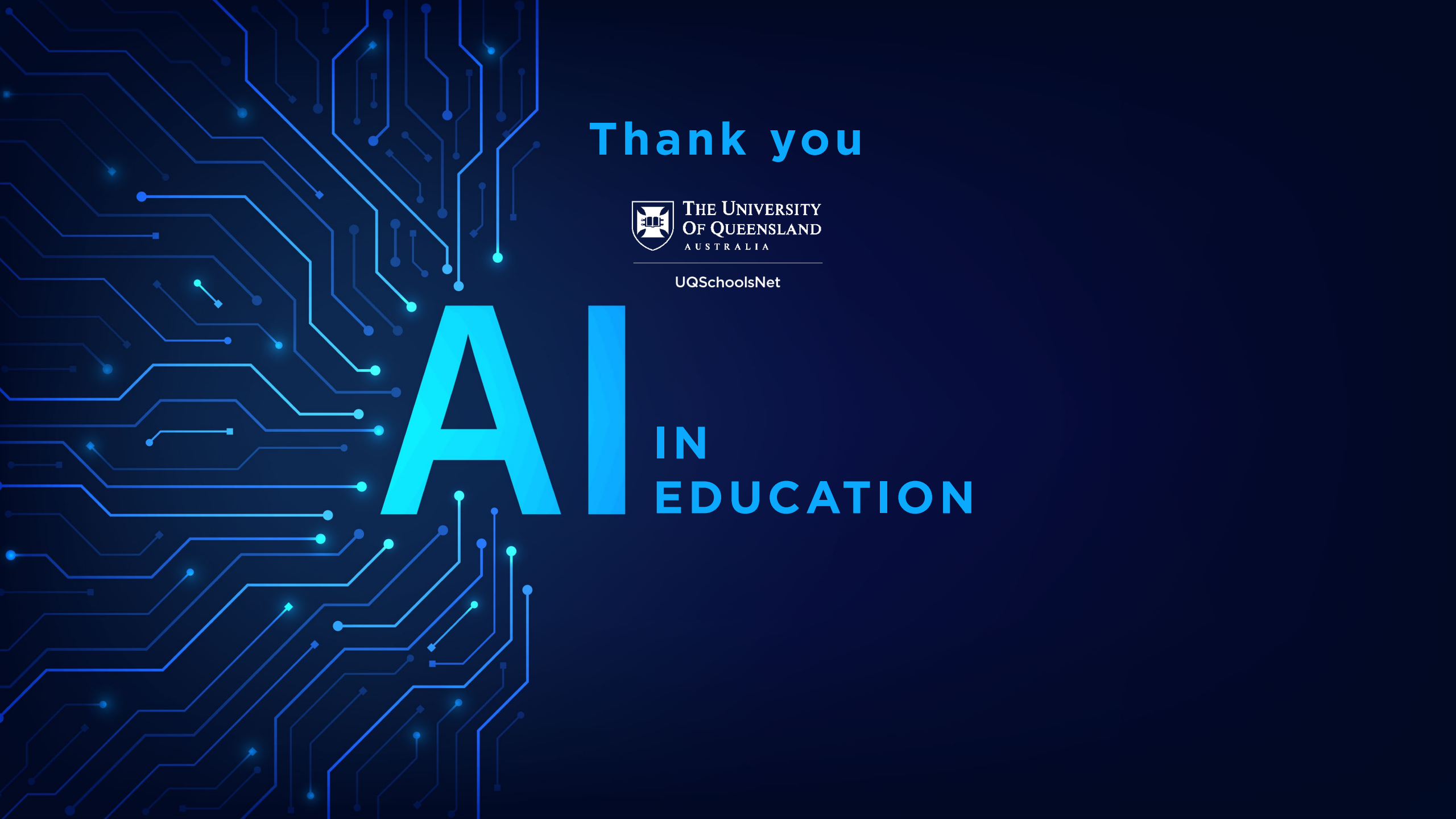


Summary

- AI's multi-perspective significance in education is on the rise, presenting both challenges and solutions.
- While AI tools are becoming increasingly powerful, having a strong foundation in disciplinary knowledge remains critical for individuals.
- New waves of AI-powered educational tools are on the rise to enhance student learning while reducing teacher workload.
- As an example, I discussed the case of RiPPLE, which harness student wisdom and AI to improve student learning.
- As educators, we bear the responsibility to equip students with the appropriate skills to navigate a future interwoven with AI teaming and partnerships.


Thank you
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