Responsible AI in Higher ED:

Balancing Innovation & Sustainability

Glenda Morgan

Three things I am not.

- An expert on the environment
- An expert on AI
- An expert on ethics

But I am an expert on EdTech

And that’s where my focus will be

What are we talking about when we talk about AI

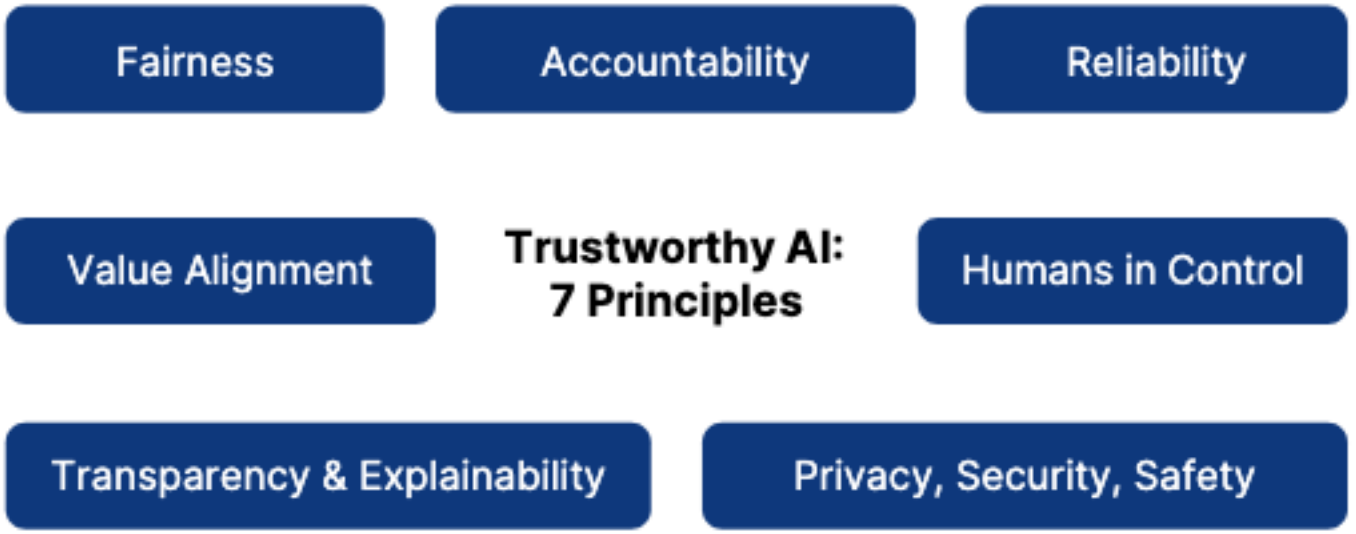
AI is a catch-all term for a group of technologies that can process information and, at least superficially, mimic human thinking.

Generative AI can be thought of as a machine-learning model that is trained to create new data, rather than making a prediction about a specific dataset. A generative AI system is one that learns to generate more objects that look like the data it was trained on.

https://news.mit.edu/2023/explained-generative-ai-1109

Many EdTech companies have developed AI Ethics or Principles for Responsible AI Use

Blackboard by Anthology



https://www.anthology.com/sites/default/files/2024-08/AI-Policy-Framework_v1_08-24.pdf

D2L

- **Privacy:** D2L prioritizes the privacy rights of our customers, both in the development and use of AI systems and in providing our customers control over their personal data, including automated decisions that are based on their personal data. Our use of AI is consistent with the statements we make in our Privacy Center.
- **Bias and Non-discrimination:** D2L strives to design, develop, and use AI systems that are unbiased and fair so that they do not cause harm to individuals interacting with D2L.
- **Security and Robustness:** D2L develops and employs safety and security practices that test AI systems to minimize the risks of harm and provide reliability and security throughout the AI system lifecycle.
- **Transparency:** D2L believes AI systems should have explainable outputs and provide relevant stakeholders disclosure about when, where, and how AI systems are used.
- **Accountability:** D2L's practices related to AI should be clear and accountable to internal and external stakeholders. D2L invests in appropriate mechanisms to support the safe and responsible use of AI.

https://www.d2l.com/legal/d2l-responsible-ai-principles/

Moodle

- Human-centered AI
- Transparency
- Configurability
- Data Protection
- Equality
- Ethical Practice
- Education

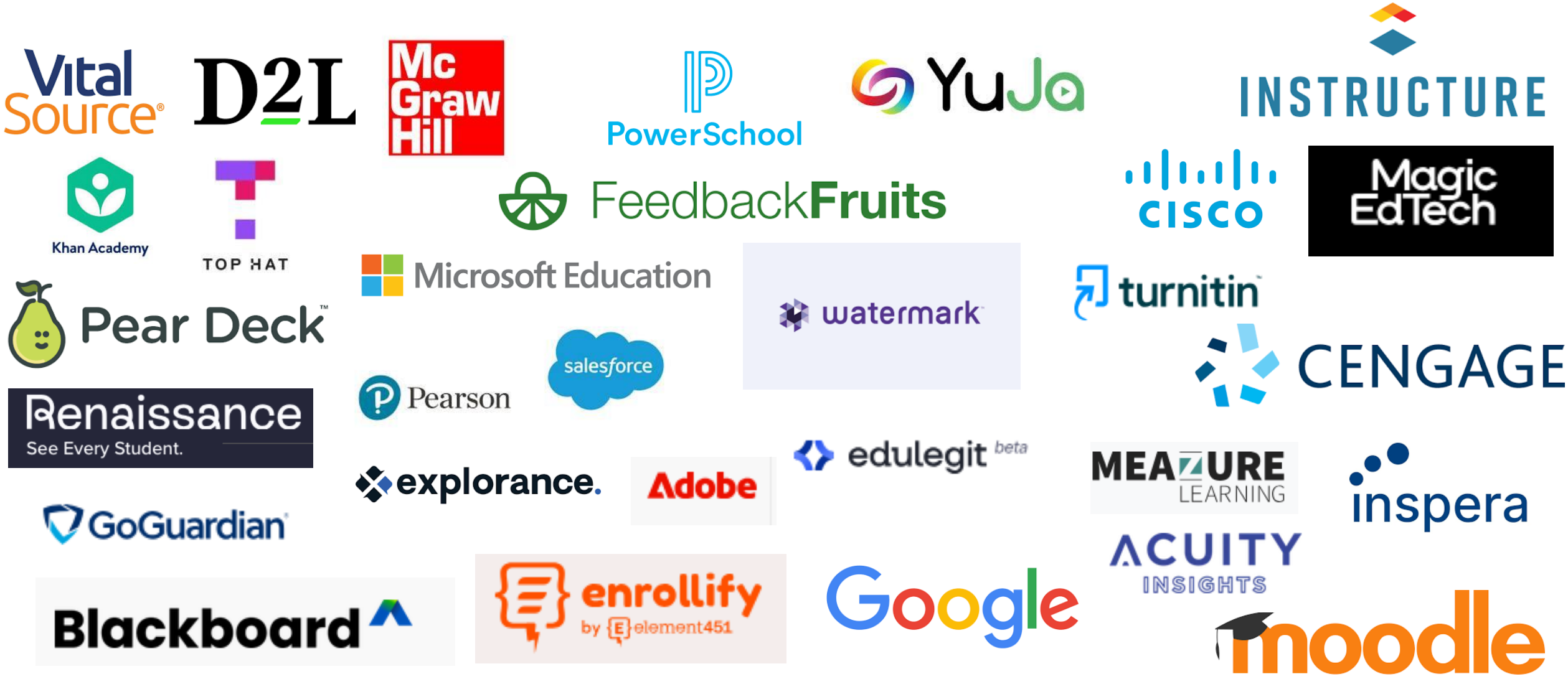
https://moodle.com/moodle-and-our-ai-principles/

Top Hat

- Data privacy and security
- Transparency and accountability
- Bias and equity
- Human-AI collaboration
- Cross-functional collaboration
- Training

https://tophat.com/ai-guiding-principles/ and education

But many EdTech vendors have adopted principles or codes of ethics on AI



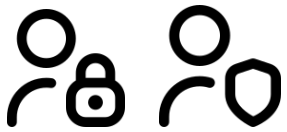
Industry approaches

Software & Information Industry Association

- The seven principles for AI in education
- AI technologies in education should address the needs of learners, educators, and families.
- AI technologies used in education should account for educational equity, inclusion and civil rights as key elements of successful learning environments.
- AI technologies used in education must protect student privacy and data.
- AI technologies used in education should strive for transparency to enable the school community to effectively understand and engage with the AI tools.
- Companies building AI tools for education should engage with education institutions and stakeholders to explain and demystify the opportunities and risks of new AI technologies.
- The education technology industry should work with the greater education community to identify ways to support AI literacy for students and educators.

https://edtechprinciples.com/principles-for-ai-in-education/

In summary – most principles focus on these concerns



Privacy & security

Transparency

Humans in the Loop

Fairness – No Bias

Informing & educating

What none of them do is draw attention to the environmental impact of AI

Even when they are addressing the environment directly

As part of our strategic approach to sustainability, we are proud to highlight our partnership with AWS for data hosting services. By leveraging AWS, who is committed to Amazon's net-zero carbon goal, we contribute to a sustainable digital infrastructure, minimizing our environmental footprint and reinforcing our dedication to eco-friendly practices in the realm of educational technology.

Instructure ESG Report, 2023

https://s28.q4cdn.com/381552498/files/doc_downloads/2024/2023_esg_report.pdf

Or they focus only on the positive

Principle 1: AI should benefit people and the planet by driving inclusive growth, sustainable development and well-being.

Lightspeed Systems aims to benefit people and the planet by using AI to improve education outcomes. Lightspeed Systems uses AI to help schools optimize their technology investments, enhance their digital learning environments, and protect their students from online harms. Lightspeed Systems also uses AI to reduce our environmental impact, by leveraging cloud computing and minimizing our energy consumption and carbon footprint.

https://www.lightspeedsystems.com/responsible-use-of-ai/

AI can benefit the environment

Optimizing transportation

Optimizing energy consumption

Monitoring deforestation

Monitoring air pollution

Modelling climate change

But there are significant adverse impacts

Increased electricity usage

Increased carbon emissions

Increased water usage

Hardware

E-Waste

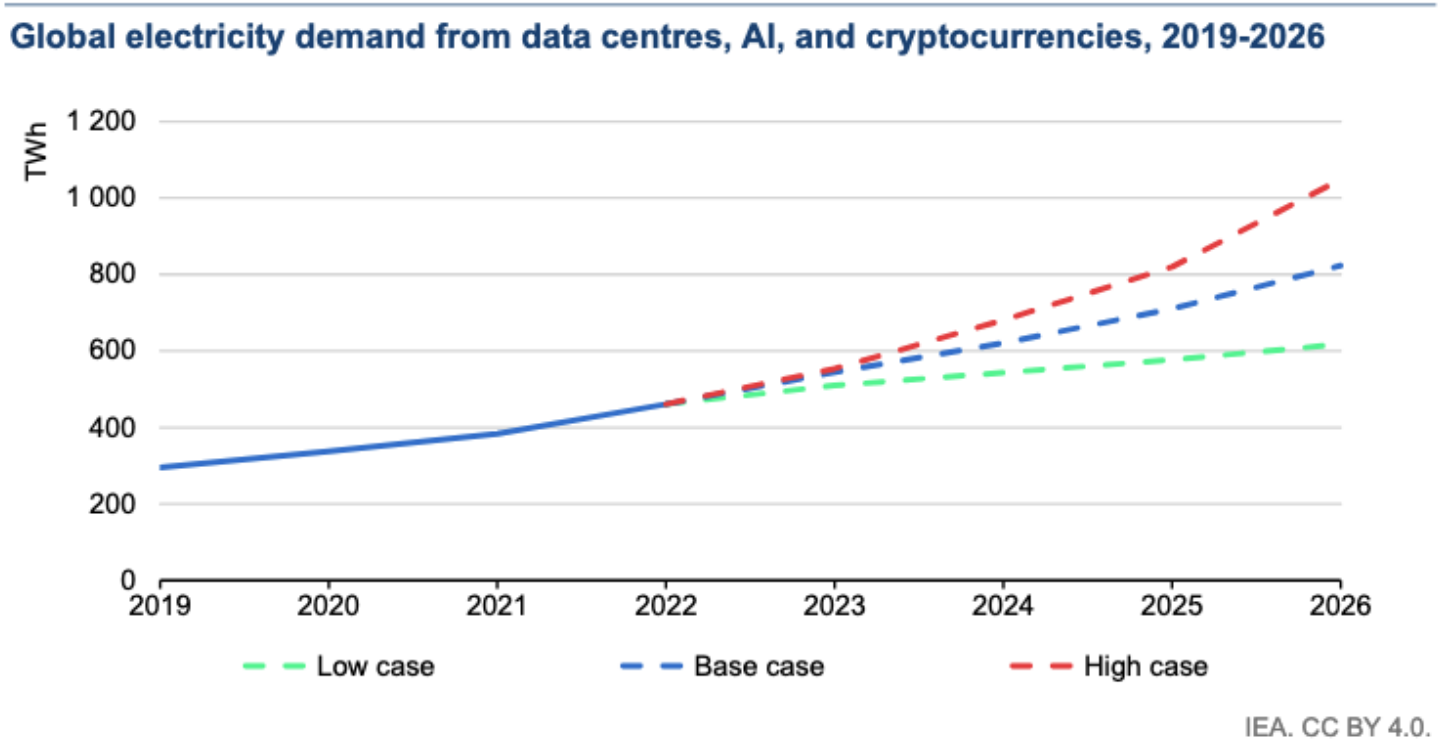
Increased electricity usage

AI & Crypto
Electricity consumption

2X

2024 -2026

International Energy Association



Notes: Includes traditional data centres, dedicated AI data centres, and cryptocurrency consumption; excludes demand from data transmission networks. The base case scenario has been used in the overall forecast in this report. Low and high case scenarios reflect the uncertainties in the pace of deployment and efficiency gains amid future technological developments.

Sources: Joule (2023), de Vries, The growing energy footprint of AI; CCRI Indices (carbon-ratings.com); The Guardian, Use of AI to reduce data centre energy use; Motors in data centres; The Royal Society, The future of computing beyond Moore's Law; Ireland Central Statistics Office, Data Centres electricity consumption 2022; and Danish Energy Agency, Denmark's energy and climate outlook 2018.

https://iea.blob.core.windows.net/assets/6b2fd954-2017-408e-bf08-952fdd62118a/Electricity2024-Analysisandforecastto2026.pdf

Training & running AI takes more power

When comparing electricity demand, a single Google search takes 0.3 watt-hours of electricity, while OpenAI's ChatGPT takes 2.9 watt-hours of electricity. **That's nearly 10 times as much electricity needed**.

IEA

Actually, it's a bit more complicated

https://engineeringprompts.substack.com/p/does-chatgpt-use-10x-more-energy

More electricity means more carbon in the atmosphere

Data Centers

will emit

3X

More CO_2
between now and 2030
than if AI wasn't being used

Morgan Stanley Global Data Centers: Sizing & Solving for CO_2
https://www.theregister.com/2024/09/06/datacenters_set_to_emit_3x/

Data center carbon footprint

Scope 2

Purchased Electricity

Scope 3

Supply Chain

Transportation

Scope 1

Facility

Generator

Scope 3

eWaste

Supply Chain

INDIRECT

DIRECT

INDIRECT

UPSTREAM

DOWNSTREAM

Corporations who measure environmental impact are seeing the increase

29.1%

Microsoft emissions increased in Fy23 compared to base year of 2020

2024 Environmental Sustainability Report

https://cdn-dynmedia-1.microsoft.com/is/content/microsoftcorp/microsoft/msc/documents/presentations/CSR/Microsoft-2024-Environmental-Sustainability-Report.pdf#page=1

Increased water usage

By 2027 global AI will consume

4.2 – 6.6 billion cubic meters
Annual water consumption of Denmark

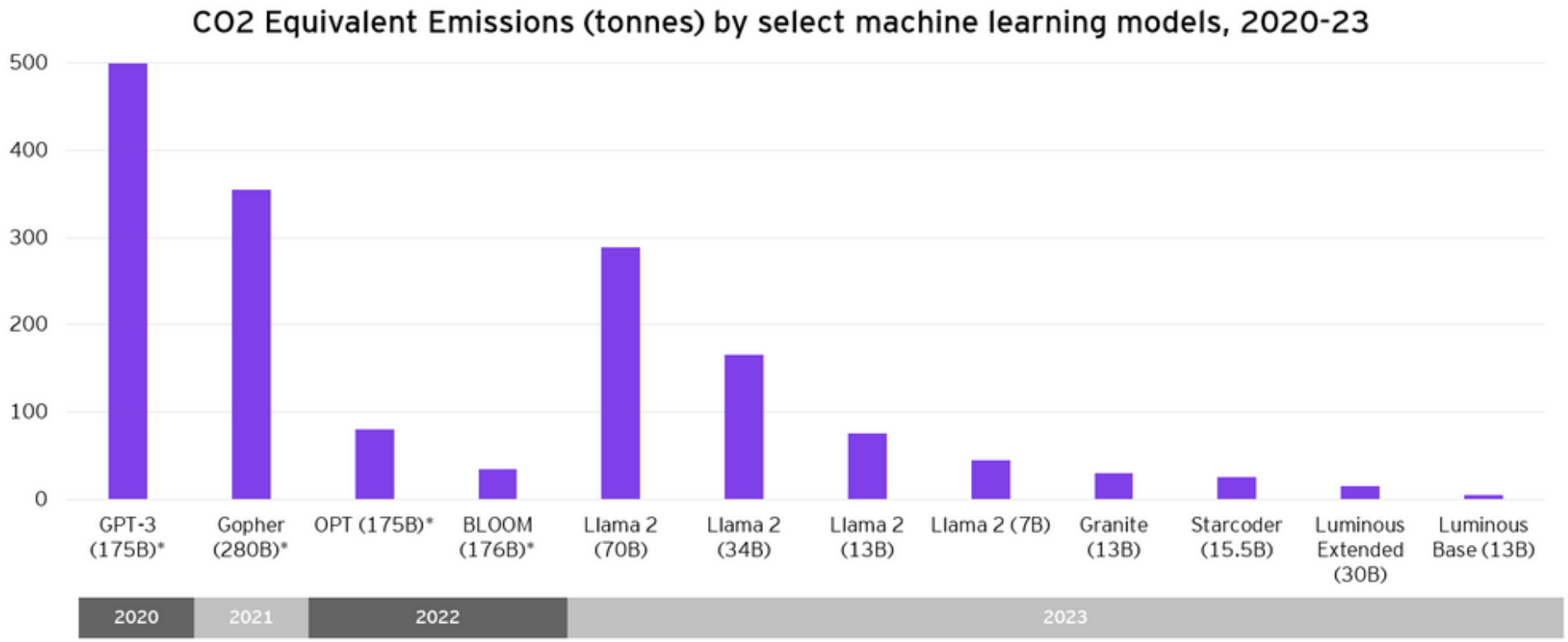
25%

Google’s data centers share of the water consumption in The Dalles, Oregon

https://arxiv.org/pdf/2304.03271

https://www.oregonlive.com/silicon-forest/2022/12/googles-water-use-is-soaring-in-the-dalles-records-show-with-two-more-data-centers-to-come.html

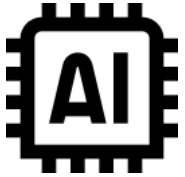
AI is becoming more energy efficient



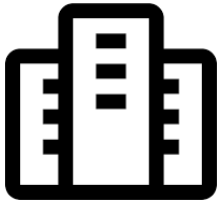
https://www.ey.com/en_nl/insights/climate-change-sustainability-services/ai-and-sustainability-opportunities-challenges-and-impact

Driven by improvements in a range of areas

More efficient data center cooling



More efficient chip architecture



More energy efficient data centers & hardware

More emphasis on renewable energy

Metrics

SCI - first reliable, fair, and comparable protocol for measuring software's carbon emissions

https://drive.google.com/file/d/1grzqNwVt3eaOfkLAYkv2rAHDq9Nc6mib/view

Green Software Design

Dev Sus Ops

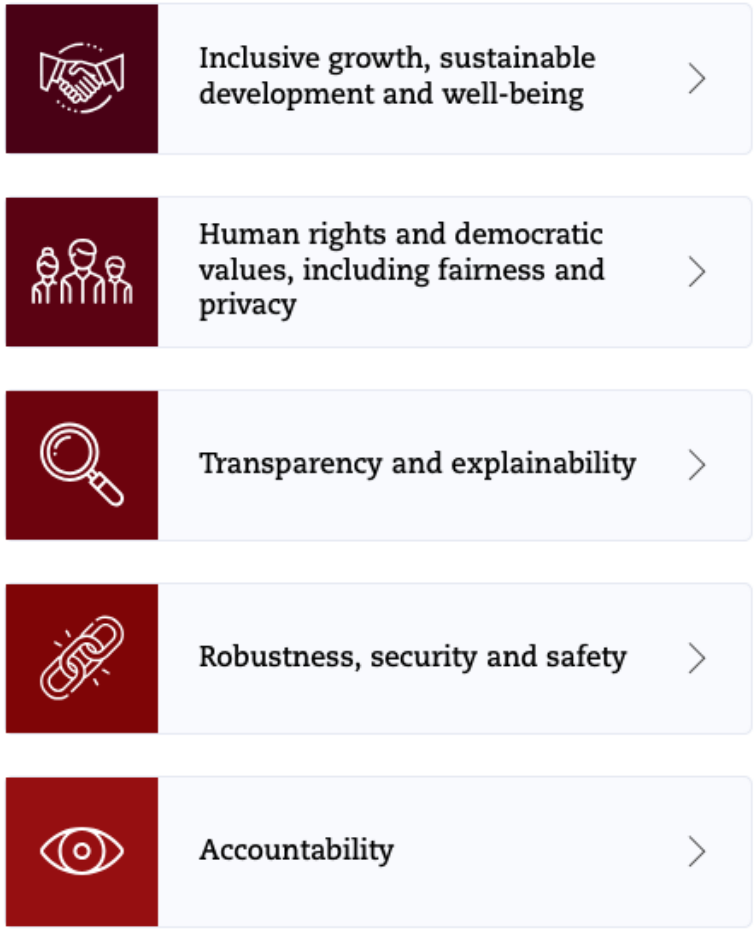
a framework that integrates sustainability into the development and operations of software

https://www.infoq.com/presentations/devsusops/

Awareness of the environmental impact is beginning to register among international governments, organizations & even corporations

OECD

Values-based principles



https://oecd.ai/en/ai-principles

EU Artificial Intelligence Act

Comprehensive regulation to make AI safe in the European Union. Classifies AI as unacceptable, high, limited & minimal risk.

Article 40 of the EU AI Act establishes a framework for developing harmonized standards aimed at improving AI systems resource performance, with a particular focus on energy efficiency

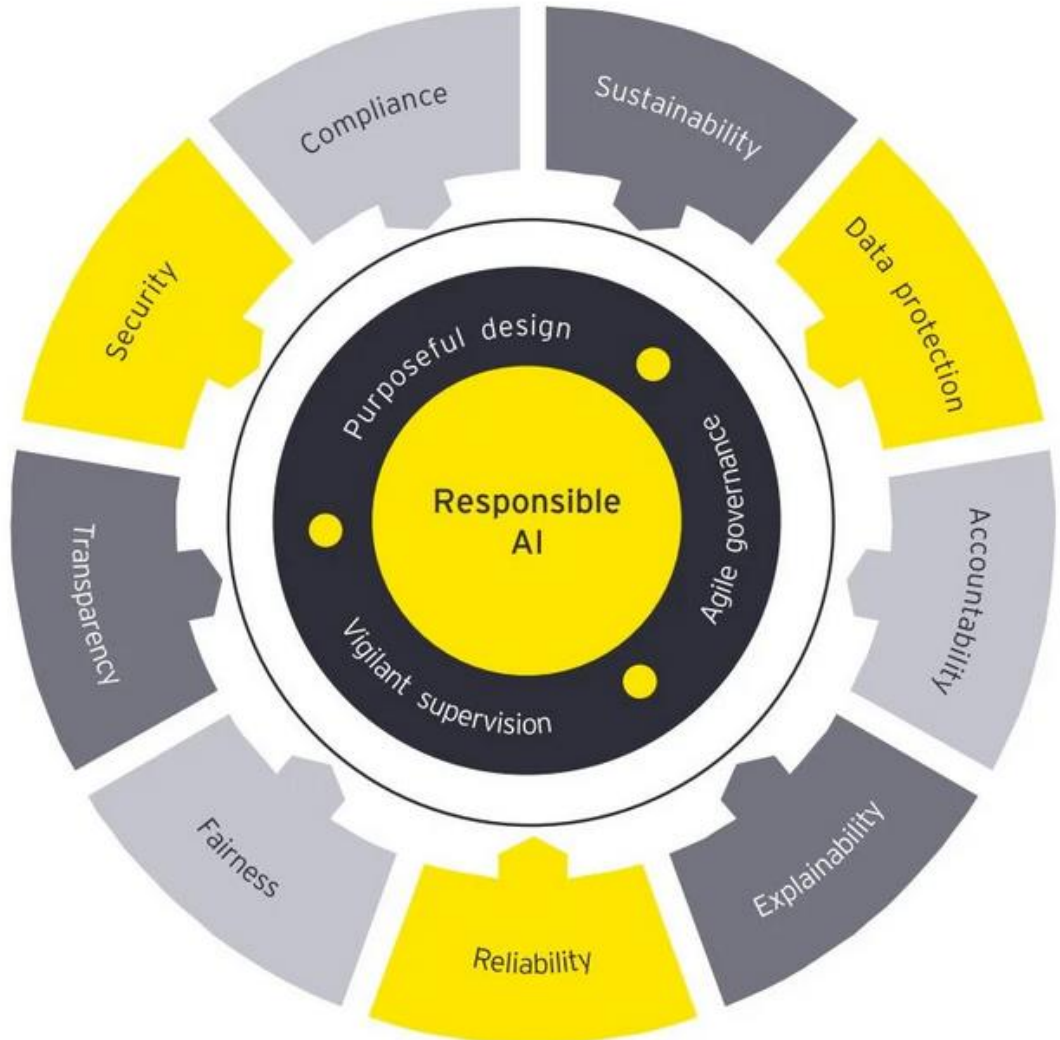
https://artificialintelligenceact.eu/

Australia

- Principles At a Glance
- Human, societal and environmental wellbeing: AI systems should benefit individuals, society and the **environment**.
- Human-centred values: AI systems should respect human rights, diversity, and the autonomy of individuals.
- Fairness: AI systems should be inclusive and accessible, and should not involve or result in unfair discrimination against individuals, communities or groups.
- Privacy protection and security: AI systems should respect and uphold privacy rights and data protection, and ensure the security of data.
- Reliability and safety: AI systems should reliably operate in accordance with their intended purpose.
- Transparency and explainability: There should be transparency and responsible disclosure so people can understand when they are being significantly impacted by AI, and can find out when an AI system is engaging with them.
- Contestability: When an AI system significantly impacts a person, community, group or **environment**, there should be a timely process to allow people to challenge the use or outcomes of the AI system.
- Accountability: People responsible for the different phases of the AI system lifecycle should be identifiable and accountable for the outcomes of the AI systems, and human oversight of AI systems should be enabled.

https://www.industry.gov.au/publications/australias-artificial-intelligence-ethics-principles/australias-ai-ethics-principles

EY



https://www.ey.com/en_nl/insights/climate-change-sustainability-services/ai-and-sustainability-opportunities-challenges-and-impact

EY

- Artificial intelligence (AI) presents a dilemma by both enabling novel use cases that may lessen environmental impacts and risking a further acceleration of environmental harm due to its growing resource intensiveness.
- Existing frameworks and legislation often fall short of providing comprehensive guidance for companies to assess and integrate AI-related sustainability measures.
- Sustainability assessments and disclosures for AI systems remain complex due to existing methods that do not fully account for the holistic environmental impacts of the AI supply chain.

https://www.ey.com/en_nl/insights/climate-change-sustainability-services/ai-and-sustainability-opportunities-challenges-and-impact

Compare this approach with most EdTech companies approaches to AI

Broader Organizations

- Environment & sustainability as a focus
- Balancing use & impact
- Acknowledging complexity
- Dynamic & emerging nature of the space

EdTech

- No focus on environment or sustainability
- No sense that there are trade-offs or how to make them
- Avoids hard choices – motherhood & apple pie
- No appreciation of the dynamic & emerging nature of the space

In EdTech we have too limited a notion of ethical or responsible AI use

They should be doing this already & not just with AI

Inward looking – not at broader impact

Risk oriented

Reactive

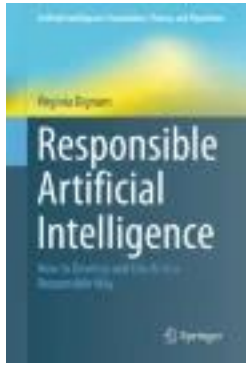
It assumes AI deployment as a given – does not consider non-use

Balancing Use & Non-Use

Libraries are beginning to weigh the benefits of digital preservation against the environmental & cost impact

We need a more expansive concept of ethical or responsible AI use

Some see this a difference between AI ethics and responsible use



Dignum differentiates between responsible use & ethics

Ethics as “the study of moral and values, while responsibility is the practical application of not only ethical concerns but also legal, economical and cultural ones to decide what benefits society as whole”

https://www.amazon.com/Responsible-Artificial-Intelligence-Foundations-Algorithms/dp/3030303705/

[E]thics refers to well-founded standards of right and wrong that prescribe what humans ought to do, usually in terms of rights, obligations, benefits to society, fairness, or specific virtues.

https://www.scu.edu/ethics/ethics-resources/ethical-decision-making/what-is-ethics/

Responsible AI can be defined as the practice of developing and using AI systems in a way that provides benefits to individuals, groups, and wider society, while minimising the risk of negative consequences.

https://www.csiro.au/en/news/all/articles/2023/november/responsible-ai-explainer

But we need a more expansive understanding of AI ethics/responsible AI use

We Need This

- Privacy & security
- Transparency
- Humans in the loop
- Fairness – no bias
- Educating & informing

But Also, This

- Is it beneficial in this circumstance?
- What are the upstream & downstream impacts – environment, culture, society, economy?
- Should it be used at all?

It can't just be about making AI more efficient

AI sprawl is becoming a problem in EdTech

Photo by Chris Linnett on Unsplash

What can you do?

- Develop your own sets of AI principles
- Work with your EdTech vendors to revisit their Principles & include responsible use
- Work with professional organizations, Educause, CUCCIO etc. to include discussions & activities around responsible AI use
- Incorporate an aspect of responsible AI use into procurement
- Ask vendors what they are doing to make their use of AI more sustainable
- Combat AI sprawl at your institution

Questions & discussion

Morgan@philhillaa.com

On EdTech newsletter
https://onedtech.philhillaa.com/

@morganmundum.bsky.social

https://www.linkedin.com/in/glenda-n-morgan/