From Vision to Reality: AI at the Heart of University Digital Transformation

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Digital transformation has become one of the key terms in all areas of society

COVID-19 effect on the digital transformation

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- The pandemic has had a significant effect on all aspects of people's lives, both personally and professionally
- Education at all levels, and with a global scope, suffered the effects of confinement, maximizing social inequalities [1-3]
- All the missions of the educational institutions were affected [4-5]

What is really important about digital transformation?

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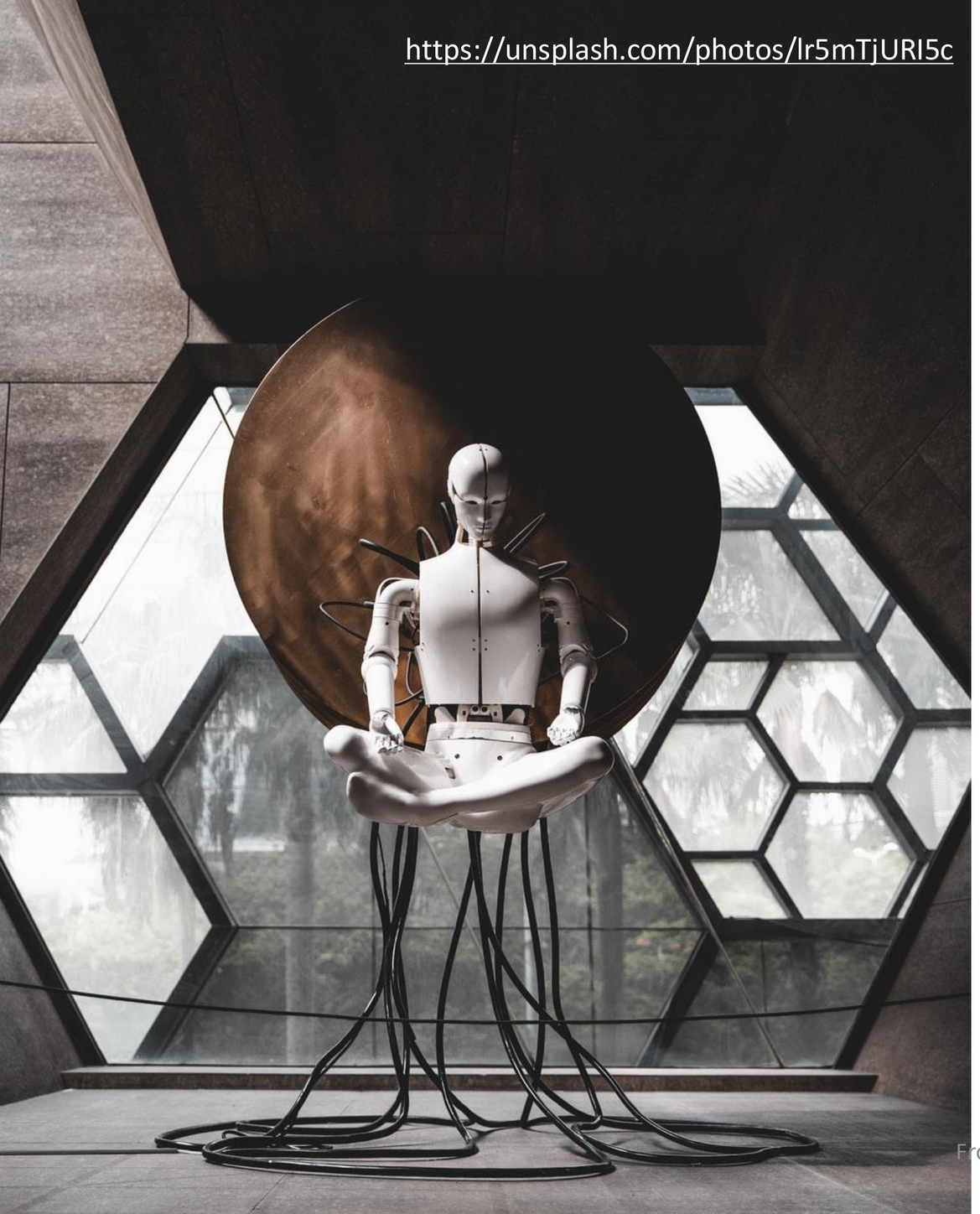
Technology?



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For any sector, digital transformation involves the use of technology to create new ways of optimizing processes and the operating model, aiming to significantly enhance their reach and impact

However, digital transformation is misunderstood when it is seen only as a technological factor

The most important thing in digital transformation is people

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The challenge behind digital transformation [6]

“We are responding to a challenge: a digital transformation that is not only about equipment and skills, but also about changes in mindset”

Antonio Rodríguez de las Heras

What is digital transformation?

Digital transformation is a **series of deep and coordinated culture, workforce, and technology shifts** that **enable new educational and operating models** and **transform** an **institution's operations**, **strategic directions**, and **value proposition**

(Grajek & Reinitz) [7]

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Each era in the history of mankind has been characterized by its own technological breakthroughs

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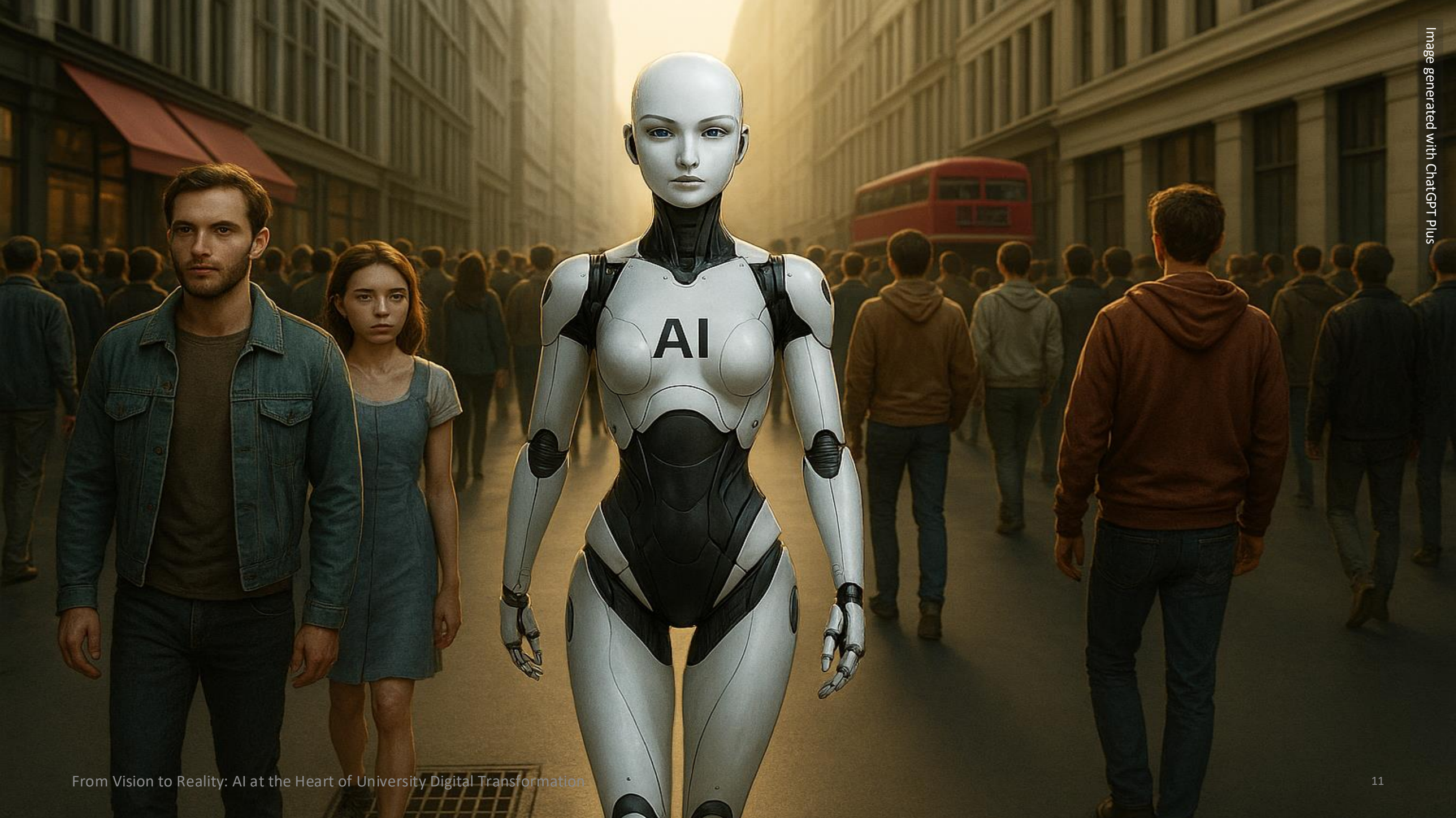
“Any sufficiently advanced technology is indistinguishable from magic”

Clarke’s Third Law [8]



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The branch of artificial intelligence that has caused technological disruption is generative artificial intelligence (GenAI) [9]

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GenAI means production of previously unseen synthetic content, in any form and to support any task, through generative modelling [10]

It is a turning point, especially because it is a technology that is integrated into the everyday life of the citizen, with a potentially overwhelming impact on people [11]

AI in Higher Education: A critical issue

- **Rapid technological advancement.** The swift evolution of AI technologies, such as ChatGPT, has significantly impacted educational paradigms, necessitating prompt adaptation by higher education institutions
  - The **automatic generation of educational content** in digital format (text, image, video, presentations, audio, etc.) is a reality
  - These **contents have quality enough** to be used as teaching materials or as results of a teaching activity, without the possibility (in most cases) of detecting their origin with sufficient certainty [12]

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AI in Higher Education: A critical issue

- **Changing students' expectations.** Modern students anticipate personalised, flexible, and tech-integrated learning experiences, aligning with the capabilities offered by AI-driven educational tools
- **Workforce demands**. The job market increasingly requires AI literacy and digital competencies, pressing universities to integrate AI into curricula to prepare graduates effectively
- **Educational myths**. Education is not immune to exaggerations and inaccuracies about the potential of AI, giving rise to its myths and projections, derived from the catastrophic or excessively benevolent perspectives shared in popular wisdom or technological solutionism [13]

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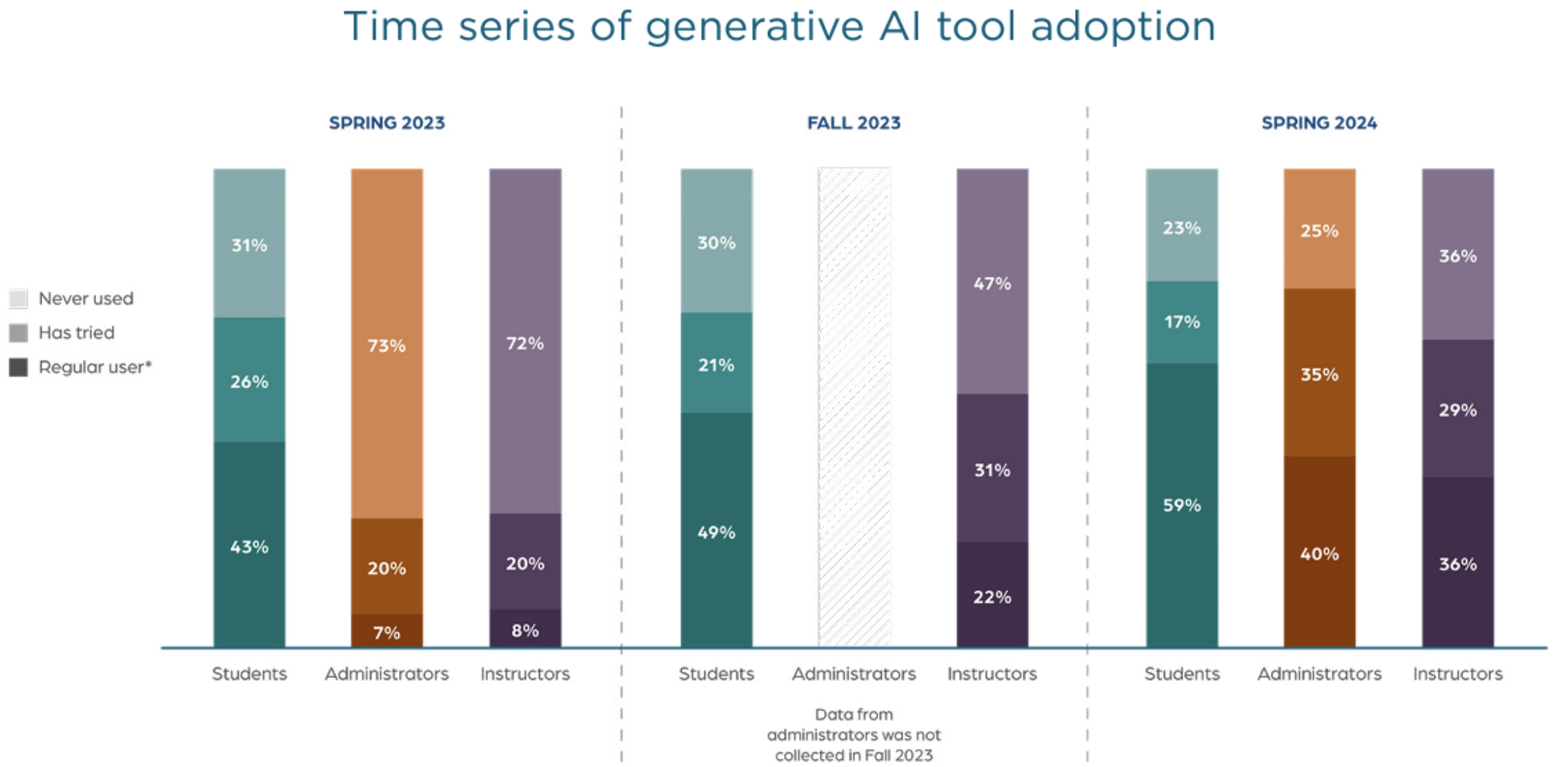
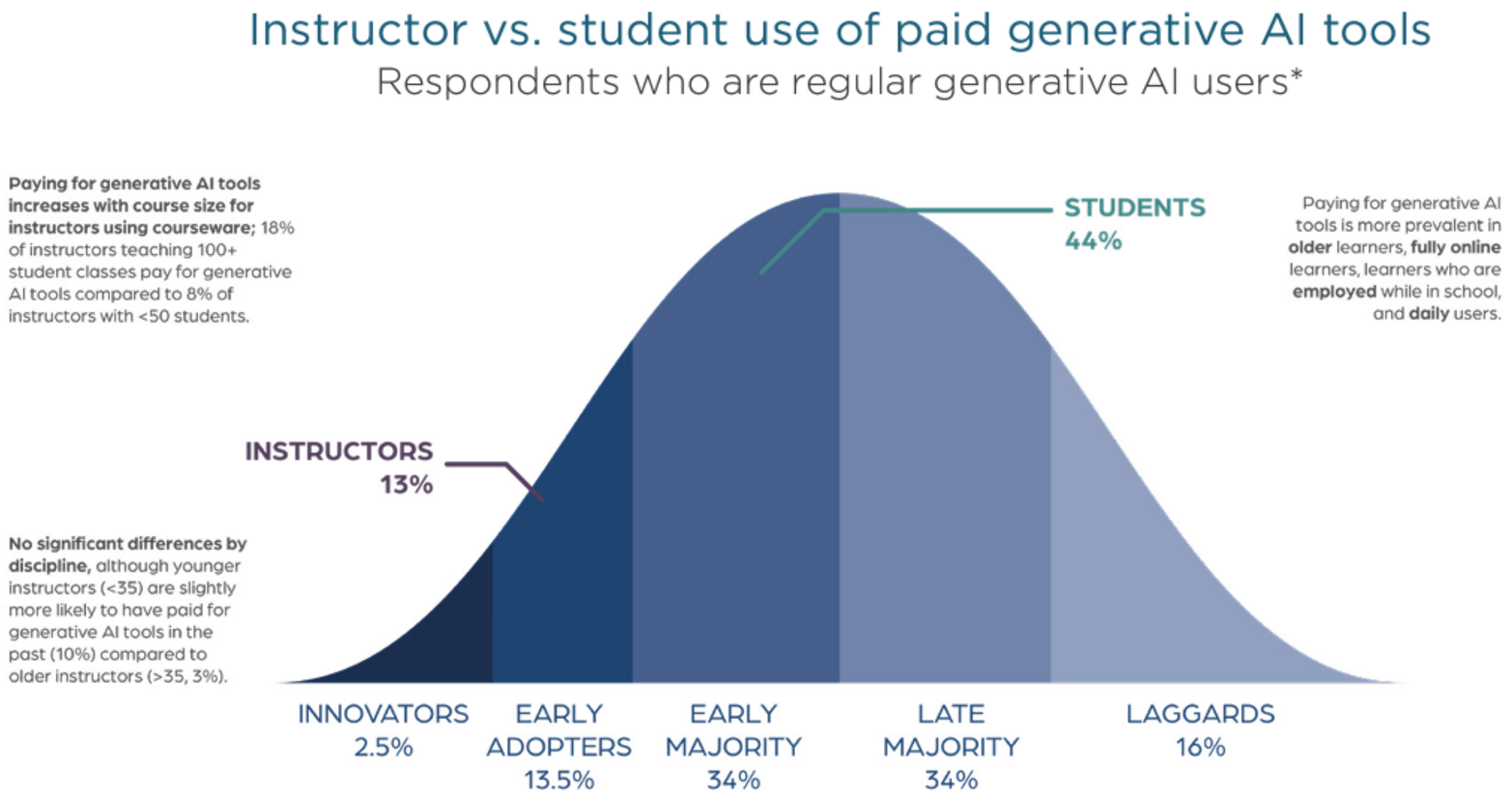
Adoption of AI in higher education [14]



Notes: **Regular usage refers to those using generative AI at least once per month. Survey questions: "Which of the following best describes your own use of generative AI tools (e.g., ChatGPT, Bard/Gemini) for work?" Instructor n (Spring 2024) = 1,827, Administrator n (Spring 2024) = 316, Student n (Spring 2024) = 1,526. "Which of the following best describes your own use of generative AI writing tools (e.g., ChatGPT)?" Instructor n (Fall 2023) = 1,601, Instructor n (Fall 2023) = 1,001. "Which of the following best describes your own use of generative AI writing tools (e.g., ChatGPT)?" Instructor n (Spring 2023) = 1,748, Administrator n (Spring 2023) = 306, Student n (Spring 2023) = 1,545; margin of error +/- 5% for administrators, +/- 2% for instructors and students.*

Sources: *Time for Class 2023, Fall 2023 Faculty & Student Pulse Surveys, Time for Class 2024, Tyton Partners analysis*

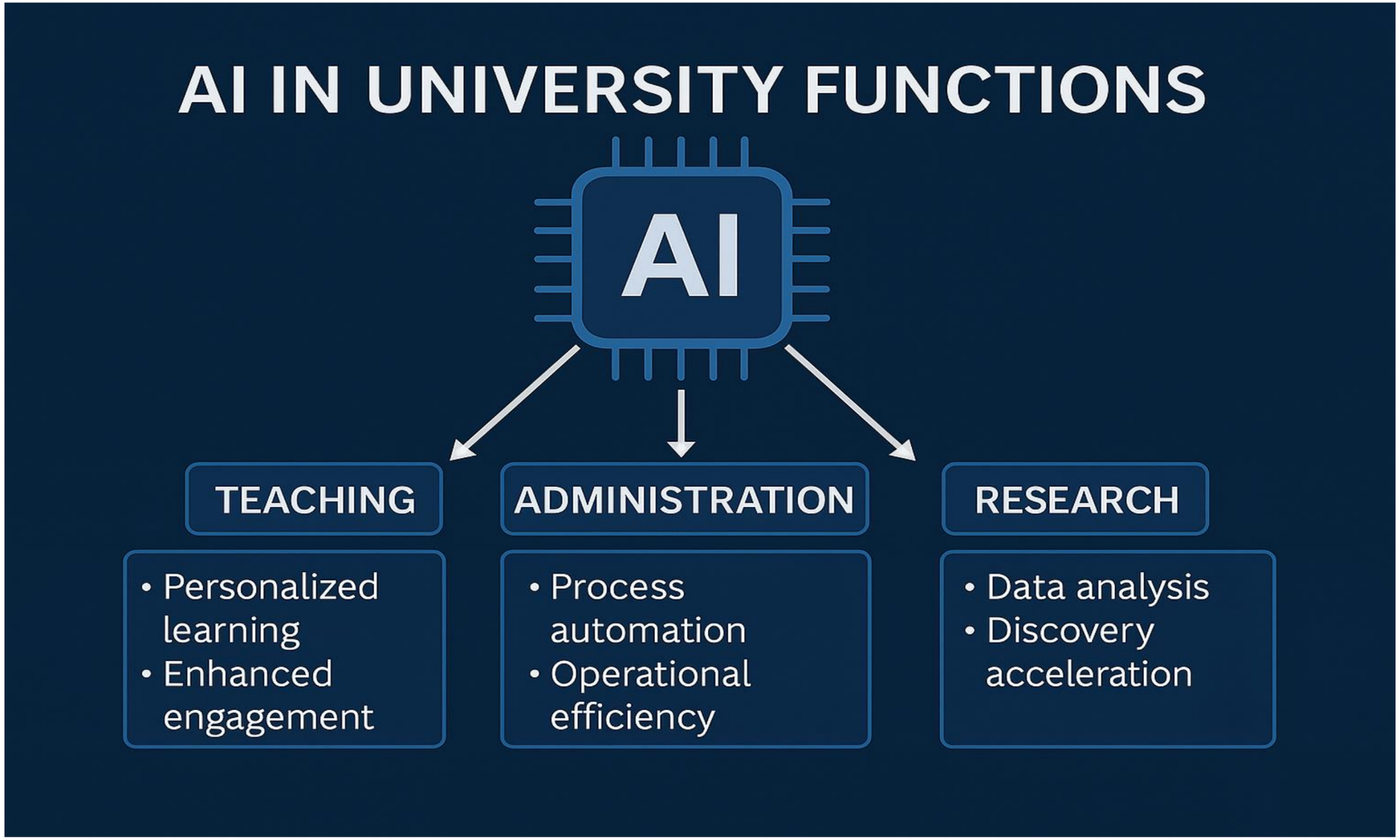
Adoption of AI in higher education [14]



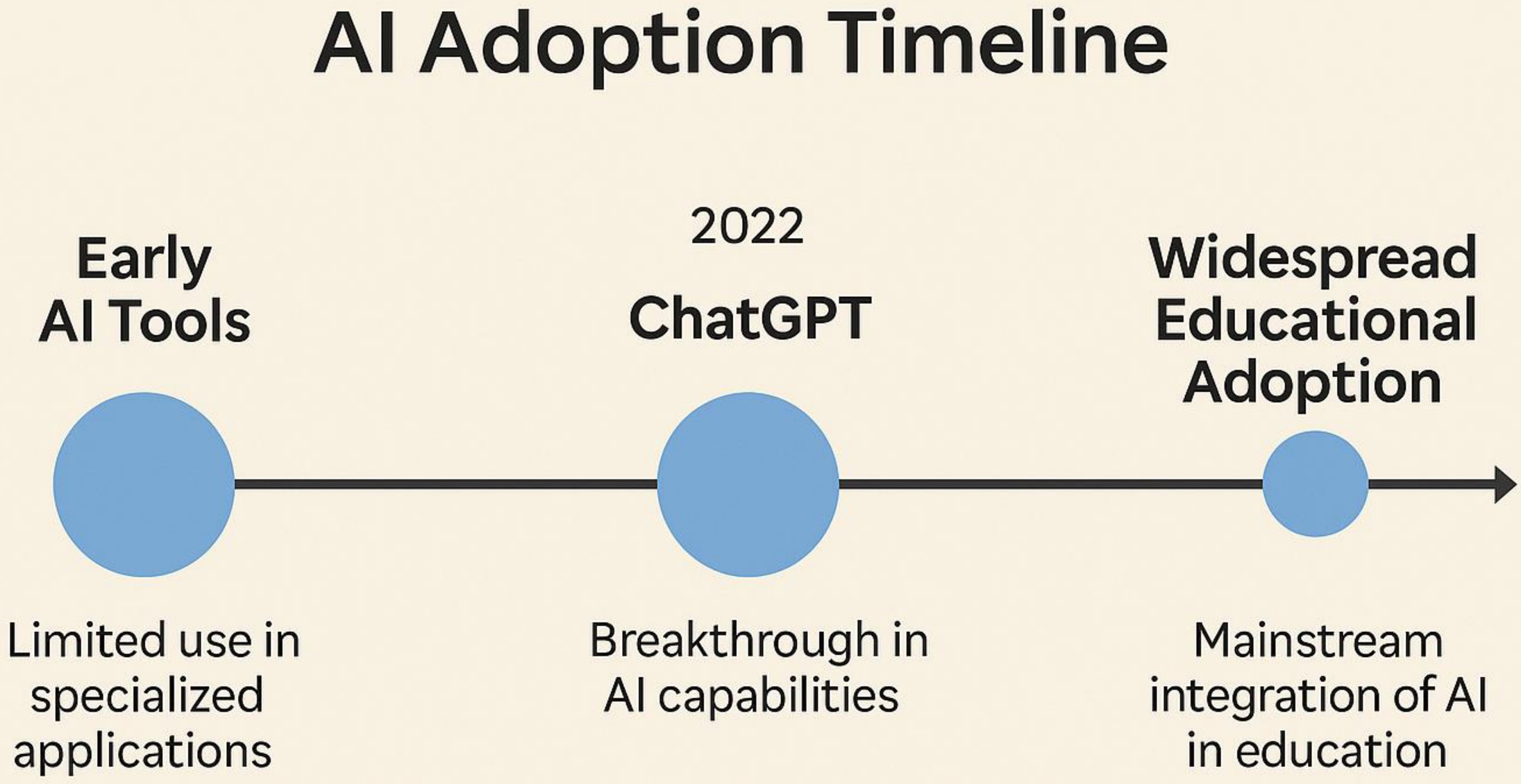
Notes: *Survey questions: "Do you pay for the use of any generative AI tools?" Instructor n = 654. "Do you pay for any subscriptions to any generative AI tools or services (e.g., ChatGPT Plus, Cheggmate) that you use for school-related work or activities?" Student n = 903. *"Regular generative AI users" are those who indicated that they use generative AI tools at least monthly.*

Sources: *Time for Class 2024, Tyton Partners analysis*

Harnessing AI for educational excellence



From ChatGPT to GenAI: A paradigm shift in Higher Education



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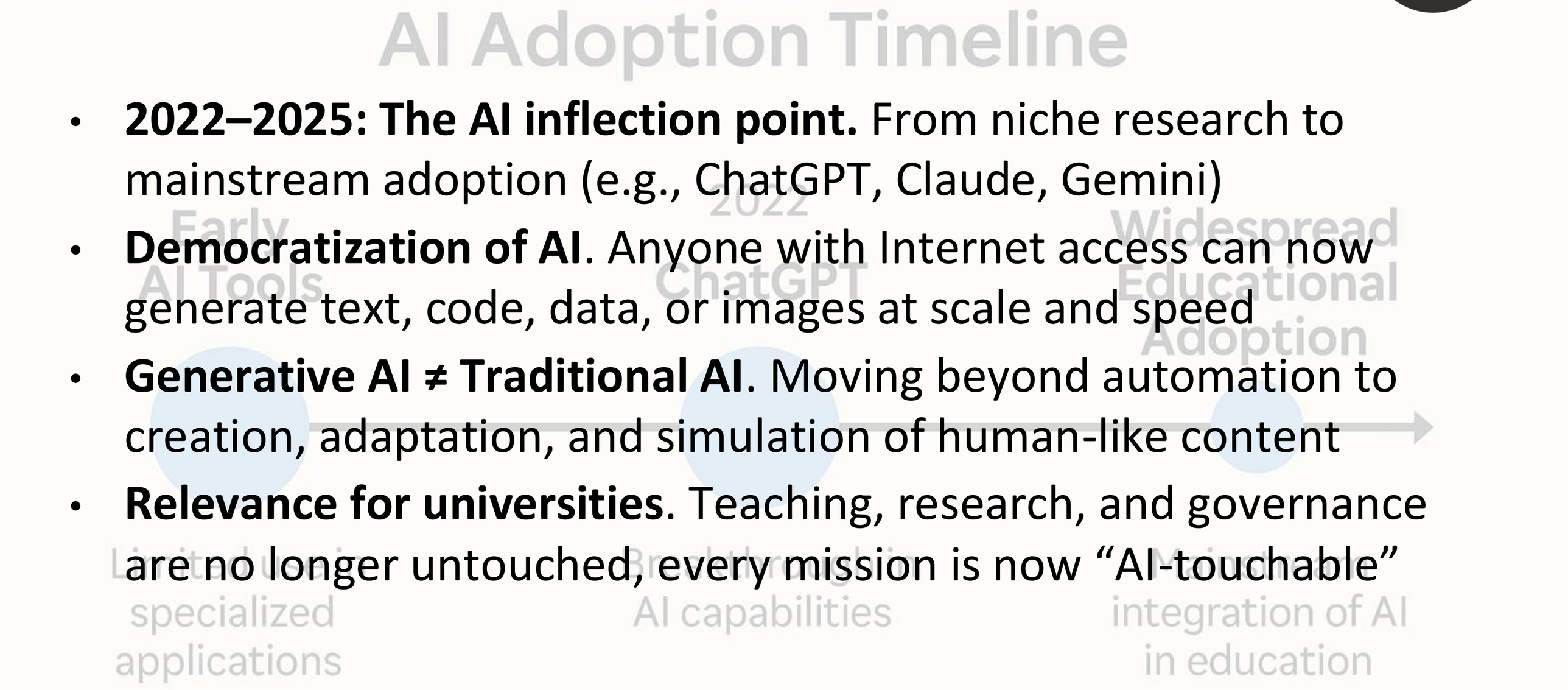
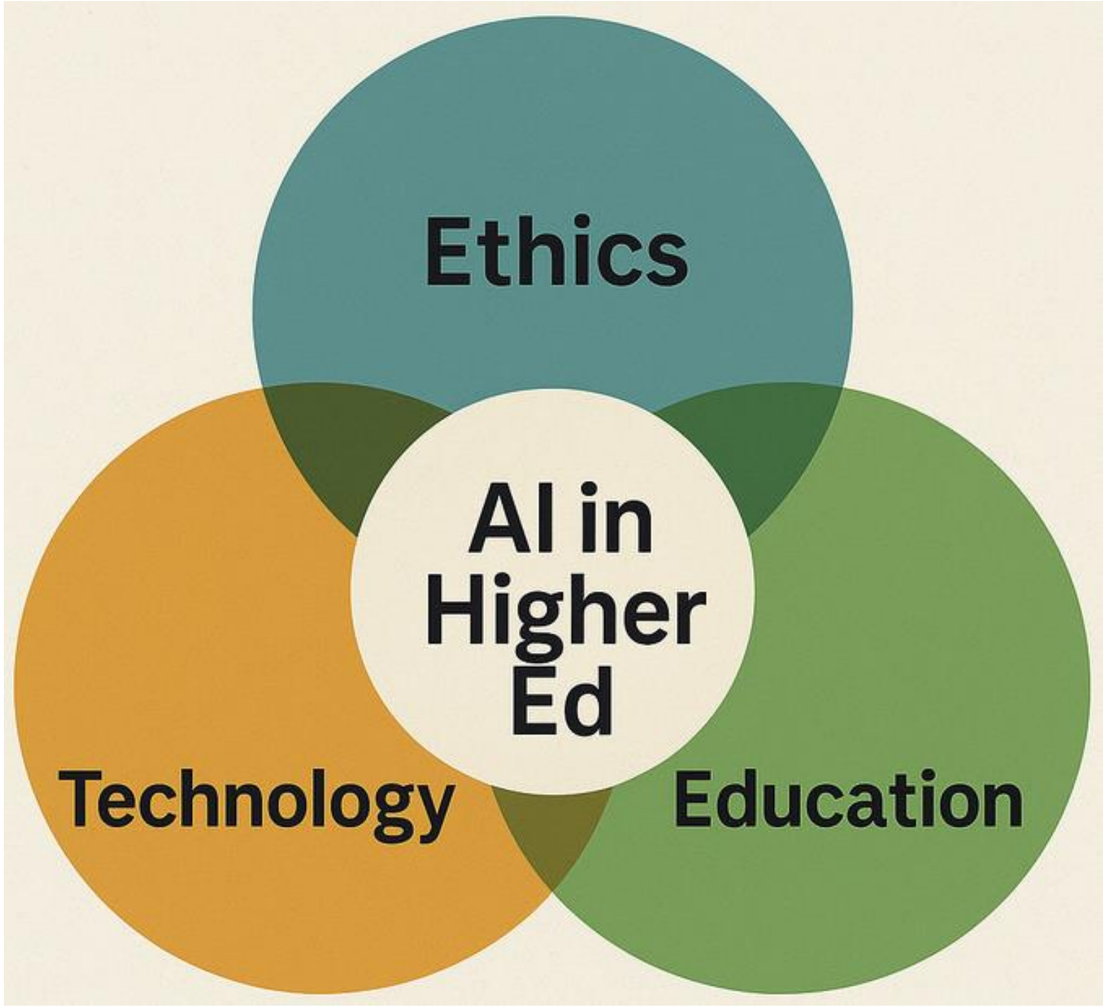


- **2022–2025: The AI inflection point.** From niche research to mainstream adoption (e.g., ChatGPT, Claude, Gemini)
- **Democratization of AI**. Anyone with Internet access can now generate text, code, data, or images at scale and speed
- **Generative AI ≠ Traditional AI**. Moving beyond automation to creation, adaptation, and simulation of human-like content
- **Relevance for universities**. Teaching, research, and governance are no longer untouched, every mission is now “AI-touchable”

A vision rooted in ethics and opportunity

- **Fear vs. empowerment**
  - AI is often seen as a threat, but it also presents an **opportunity to transform education for good**
- **Not just tools, but mindsets**
  - AI adoption requires **rethinking roles**: from teacher as transmitter to **curator, facilitator, and guide**
- **Institutional responsibility**
  - Universities must **lead with values**: equity, transparency, and human-centred design
- **Responsible innovation**
  - Promoting **AI literacy, ethical awareness, and digital governance** from the outset



Safe AI in Education Manifesto [15, 16]

The Manifesto for Safe AI in Education proposes **fundamental principles that ensure that AI is implemented in educational settings** in a manner that is **ethical, safe, and aligned with the fundamental goals of education**

These principles are based on the belief that **AI should always be at the service of people**, enhancing human capabilities rather than replacing them

https://manifesto.safeaieducation.org

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Safe AI in Education Manifesto [15, 16]

Principle 1: Human Oversight and Accountability

Principle 2: Guaranteeing Confidentiality

Principle 3: Alignment with Educational Strategies

Principle 4: Alignment with Didactic Practices

Principle 5: Accuracy and Explainability

Principle 6: Comprehensive Interface and Behavior

Principle 7: Ethical Training and Transparency

https://manifesto.safeaieducation.org

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Generative AI: 360º view of its benefits, risks, and educational challenges [17, 18]

Positive impact

- Enriching educational content
- Encouraging their creativity
- Improving productivity
- Support in evaluation
- Facilitates personalized learning
- Digital competence of teachers

Good practices

- Lifelong learning
- Balanced integration
- Promoting ethical behaviour and data protection
- Development of complementary educational content
- Virtual assistant for the teaching staff
- New forms of assessment

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Teachers

sformation

Negative aspects and risks

- Teacher reluctance to have students use these tools
- Overestimation of generative Artificial Intelligence
- Inappropriate use
- Lack of security in detecting AI-generated content
- Technological dependence
- Authorship loss
- Depersonalization
- Privacy

Future challenges

- The digital transformation in the classroom involves the natural integration of Artificial Intelligence
- Collaborative development of more specific and economical language models to sustain (e.g., Small Language Models (SLM))

Positive impact

- Critical thinking and creativity
- Prototyping ideas
- Personalized learning
- Improved productivity
- Access to more innovative resources
- Development of digital skills

Negative aspects and risks

- Dishonest use
- Superficial learning
- Possible lack of knowledge to curate the information received
- Lack of critical thinking and creativity
- Depersonalization
- Inequitable access

Students

Good practices

- Support in linguistic and writing skills
- Support for summary information
- Virtual assistant for students
- Socratic opponent
- Ethical awareness

Future challenges

- Preparing for the future of work in the age of Artificial Intelligence
- Need for lifelong and informal learning

Positive impact

- Reduction of time and improvement of efficiency
- Optimization of resources and processes, leading to a reduction in operating costs
- Automation of repetitive tasks
- Innovation and creativity
- Access to synthetic data

Good practices

- Definition of a richer technological ecosystem with more efficient research flows
- Elaboration of ethical codes for the different roles involved (researchers, reviewers, editors, etc.)
- Translations and style revisions
- Assistants for data analysis
- AI education and training
- Interdisciplinarity and collaboration

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Researches

Negative aspects and risks

- Automatic generation of much of the text (articles, papers, etc.) without justification of sources
- Negative impact of undetected hallucinations
- Ethical debates
- Lack of content curation
- Lack of critical thinking and creativity
- Infringement of privacy
- Modelling biases

Future challenges

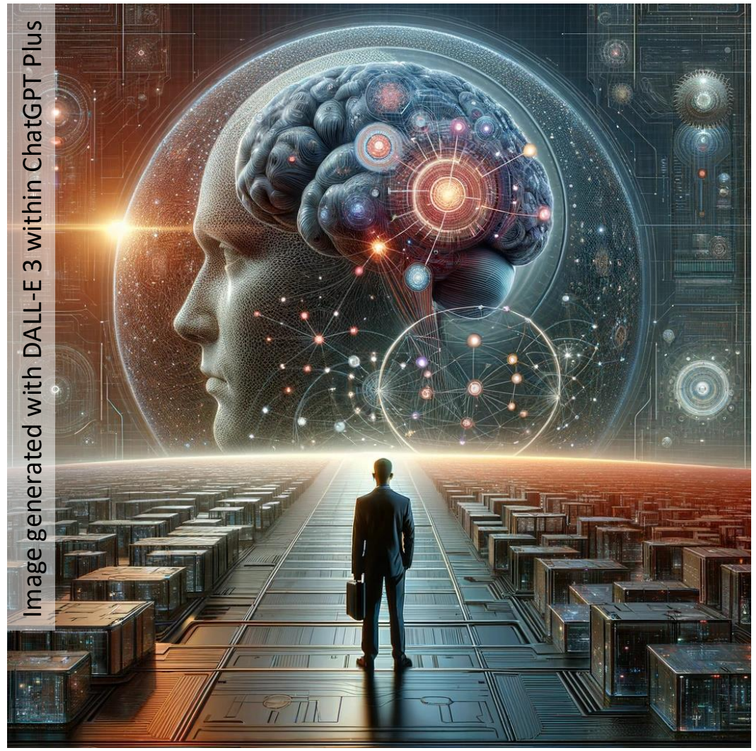
- Fairness in access to these tools
- Transparency and explainability
- Development of specialized models, free of bias, and that do not violate privacy
- Improvement of the interaction Person-IA
- Cost reduction
- Reduction of environmental impact

Positive impact

- Improving administrative efficiency
- Improving academic analytics
- Enriching the educational process
- Increasing competitiveness

Good practices

- Student and teacher training
- Review of teaching methods
- Exploring new forms of assessment
- Development of codes of ethics and general guidelines
- Collaboration and strategy setting



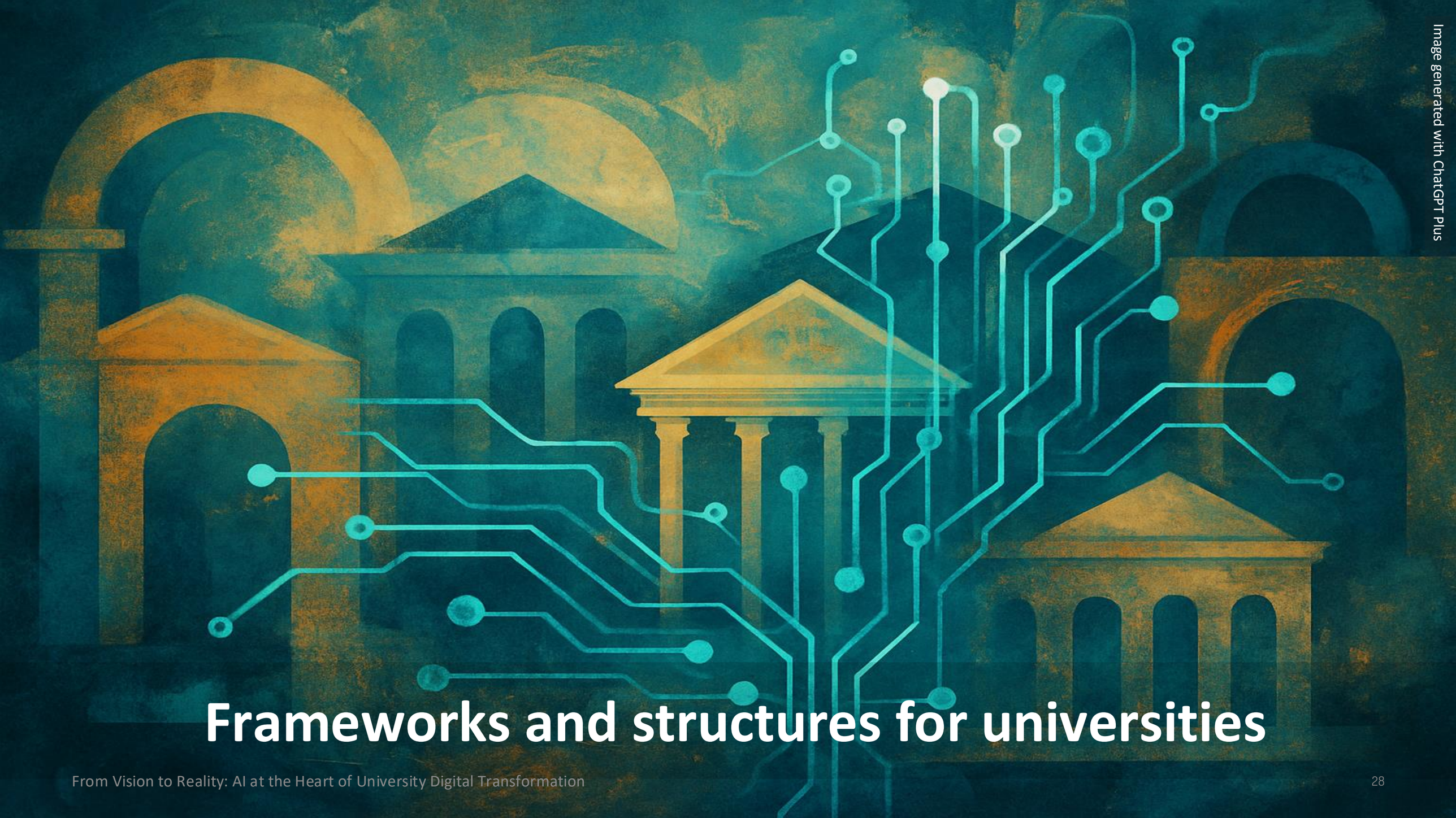
Decision makers

Negative aspects and risks

- Unequal access to these technologies
- Data security and privacy
- Technology dependencies of private companies
- Biases in training sources
- Environmental impact

Future challenges

- Review of curricular content
- Integration of Artificial Intelligence in the Digital Transformation Strategy
- Improving change management
- Ensuring equity and Access



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Frameworks and structures for universities

Why governance matters

- AI is transforming **teaching**, **research**, and **administration**
- Universities must balance **innovation with responsibility**
- Need for **strategic coordination**: ethical, legal, operational

	BIAS	LEGAL NON-COMPLIANCE	OPACITY
RISK	AI may perpetuate inequalities in admission decisions, grading, etc.	Use of AI could violate data protection laws, lead to fines	Opaque algorithms could undermine trust in university
GOVERNANCE MITIGATES	Ensure fair and unbiased application of AI tools	Maintain adherence to evolving AI regulations	Enforces explainability and transparency of AI systems

Regulatory frameworks and recommendations for the use of AI

- AI Strategy 2020 – Spain [19]
  - This strategy underscores the pivotal role of AI in driving innovation, enhancing economic competitiveness, and addressing societal challenges while simultaneously anchoring its deployment on ethical principles and inclusivity
  - In the 2023 progress report on Spain's National AI Strategy [20], a critical focus is placed on AI governance, reflecting significant strides in ethical and responsible AI development and regulation

Regulatory frameworks and recommendations for the use of AI

- European Union Strategy on AI
  - The EU has outlined a comprehensive strategy to harness the transformative power of AI while addressing ethical, legal, and societal implications
  - The “Madiega Report 2024” [21] highlights the importance of AI in driving innovation, economic growth, and social progress across member states
  - The EU’s “Artificial Intelligence Act” [22] is the first-ever legal framework on AI. This legislative approach reflects a bold attempt to establish trust in AI systems through governance, even at the cost of definitional clarity [23]
    - It follows a risk-based approach with three general objectives
      - Ensure that AI systems used in the EU and introduced in the European market are safe and respect citizens’ rights
      - Stimulate investment and innovation in the field of AI in Europe
      - Become a global benchmark for regulating AI in other jurisdictions
    - It establishes a series of horizontal protection criteria that will determine when AI systems can cause harm to society. Thus, it establishes three levels of risk: minimal, high, and inadmissible, and two additional cross-cutting risks: risk to transparency and systemic risks

Regulatory frameworks and recommendations for the use of AI

- European Union Strategy on AI
  - Due to the increase in the use and importance of GenAI [10], the European Union has developed guidelines for the responsible use of GenAI in research [24], stressing the paramount importance of maintaining research integrity, transparency, and accountability

Regulatory frameworks and recommendations for the use of AI

- UNESCO
  - UNESCO's "Recommendations on the Ethics of Artificial Intelligence" [25] represents a comprehensive framework that guides global stakeholders on the responsible development and use of AI technologies, particularly emphasizing educational contexts
  - These recommendations underscore AI's profound impact on society, both positively and negatively, and stress the need for a human-centered approach that upholds human dignity, rights, diversity, and cultural heritage
  - In response to the emerging challenges and opportunities presented by GenAI in education, UNESCO has published guidelines for the appropriate use of AI in educational settings [26]

A framework for the governance of AI in universities [27]

- **Principles for AI governance**
  - **Principle of legality**, AI Act & GDPR compliance
  - **Principle of neutrality**, bias mitigation across processes
  - **Principle of transparency**, explainability, and open communication
  - **Principle of promotion of innovation**, promoting safe experimentation

A framework for the governance of AI in universities [27]

AI governance grid

AI governance grid. (GDPR stands for general data protection regulation. AI Act stands for European artificial intelligence Act)

		Knowledge generation		
		Data	Algorithms	Uses
Principles	Legality	Observance of GDPR and AI Act	Observance of AI Act	Observance of AI Act
	Neutrality	Avoidance of data biases	Avoidance of algorithm biases	Observance ethic uses
	Transparency	Observance of consent GDPR	Requirement of explainability when possible	Requirement of a report on uses
	Promotion of innovation	Promotion of open data sources	Licensing, hardware and software procurement policies	Specific calls for AI innovation

A framework for the governance of AI in universities [27]

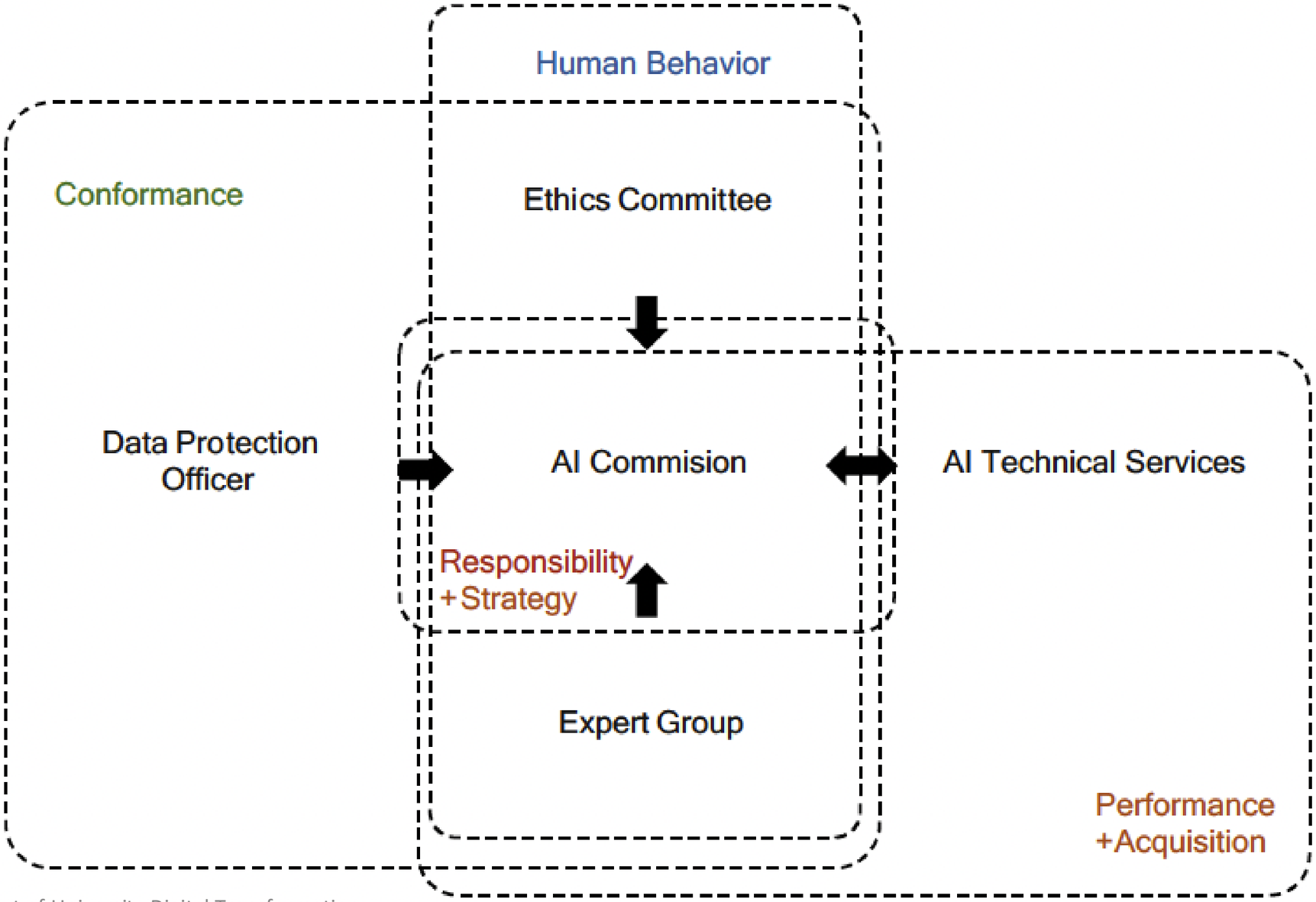
- **Structures for AI governance at universities**
  - Considering the presented principles and the universities' own digital transformation needs, the issues to be addressed for the AI governance should be in line with the ISO 38500 IT Governance standard [28] principles
    - **Responsibility**, individuals, and groups within the organization must understand and accept their responsibilities with respect to the use of AI
    - **Strategy**, the organization has a clear strategy for incorporating AI-based solutions
    - **Acquisition**, AI service providers are required to follow the same principles as the institution, with clear and transparent decision-making
    - **Performance**, technological issues related to the ability to address problems and propose AI-based solutions
    - **Conformance**, legislation, and regulations compliance of the whole knowledge generation process
    - **Human behaviour**, strict observance of ethical principles in the use of AI, is always oriented towards the well-being of people, and training in the proper use of AI-based solutions

A framework for the governance of AI in universities [27]

- **The involvement of existing structures in the university with new attributions or the creation of such structures if they do not exist**
  - **AI commission**. It is the central decision-making body for AI
  - **Ethics committee**. It should take on the responsibility of observing the aspects of human behaviour, overseeing the ethical issues raised by AI, not only in research projects but also in projects for the implementation of solutions that universities wish to incorporate into their digital ecosystem
  - **Data Protection Officer**. AI-based applications are large consumers of data and, as such, are subject to this regulation and are therefore subject to supervision by the Data Protection Officer
  - **AI technical services**. They should oversee the implementation of many of the AI solutions, or at least coordinate them with the suppliers
  - **Expert Group**. A multidisciplinary group of people, external to those responsible for the implementation of AI and experts in different fields such as the more technical principles of AI, in the application of AI solutions to human problems, in the laws that regulate and limit the uses of AI, in ethical and social aspects of AI, in university governance and the use of AI in universities, etc. Its task is to issue guidelines and reports at the request of the AI commission

A framework for the governance of AI in universities [27]

Structures for AI governance for universities



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Conclusions

Universities as agents of transformation

Making AI part of university governance is necessary to set the scenario for universities to continue to lead in this AI-driven era, ensuring that they remain at the forefront of educational innovation while safeguarding their fundamental principles [29]

> The question is not whether universities will change, but how wisely they will do so

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AI governance must be **strategic** (aligned with the institutional digital mission), **participatory**, and **ethical**

> The goal is to build an **AI-augmented academic culture**, not just AI-powered systems

Call to action, from vision to reality:
What we must do now

- **Invest** in governance structures, training, and ethical foresight
- **Promote** a culture of critical engagement with AI across disciplines
- **Collaborate** across institutions to share frameworks and best practices
- **Act with purpose**, the choices made now will define the future of education

> Let us not just use AI, let us **teach it**, **question it**, and **lead through it**

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References

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