Volume 1, Issue 1 (2025), pp. 202-214
Journal of Global Higher Education
https://www.jghe.org
DOI: 10.25774/jghe.v1i1.368

CRITICAL REFLECTIONS

# Silicon and Ivory: How Will AI Reshape Universities?

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## Abstract

This reflection examines artificial intelligence's impact on higher education, particularly the evolving relationship between faculty and students that has defined universities since mediaeval times. This paper analyses how AI tutoring systems or generative AI challenge traditional academic structures. Whilst optimists herald AI's potential for democratising knowledge, personalising learning, and enhancing research capabilities, significant concerns emerge regarding skills atrophy, widening global educational inequalities, and ethical dilemmas surrounding academic integrity. The reflection critiques AI's energy consumption, copyright infringement, and potential job displacement in academia. Despite predictions of universities' obsolescence, this paper argues that institutions must critically embrace AI whilst preserving the essential human bonds between educators and learners. The emergence of what might be termed the 'Universit-AI' requires careful navigation between technological advancement and maintaining universities' core mission of developing critical thinking and serving the common good. Universities must maintain their agency through adaptation rather than resistance to ensure their continued relevance.

**Keywords**: Artificial intelligence (AI); generative AI; higher education institutions; university transformation; skills atrophy; academic integrity.

## Introduction

In his book *The Light Ages* (2020), Falk explained that universitas refers to the unions between students and teachers more than to any building or formal course of study. The term was used to describe communities of teachers and students who shared a similar purpose: learning. It was around these associations that the first universities in Europe were established. Rashdall (1895) noted:

> The word 'university' means merely a number, a plurality, an aggregate of persons. Universitas vestra, in a letter addressed to a body of persons, means merely 'the whole of you'; in a more technical sense it denotes [...] practically the equivalent of collegium. [...] It is particularly important to notice that the term was generally in the Middle Ages used distinctly of the scholastic body whether of teachers or scholars, not of the place in which such a body was established, or even of its collective schools. The word used to denote the academic institutions in the abstract – the schools or the town which held them – was studium rather than universitas. (p. 7)

This reflection discusses the challenges that AI presents in higher education[1], focusing first on the changes in interactions between faculty and students (as the core of the university establishment) and then on how the organisation of work in higher education institutions would be modified. Two other critical considerations concern the general purpose of developing AI versus the overall drive of higher education, which is to educate society and future citizens and enhance the common good and development of nations. However, it is less clear, given how recent it is, whether AI has a higher purpose for society. Most companies that develop AI are private; this may limit its interests and communal goals. The other concern is that dependency on AI would impact the way ideas and critical thinking are learned by students. If critical thinking is not taught in school, how will it be learned by students?

Recent surveys (Quacquarelli Symonds, 2023) indicate that about half of higher education students use AI weekly or daily. They feel it is convenient and helps with tasks students do not want to do or do not understand. In some cases, brainstorming is the most important use. Other surveys show that 30% of faculty use AI (Tyton Partners, 2023), but 37% prohibit students from using it (Quacquerelli Symonds, 2023). Another questionnaire to about 600 institutions reported that only 39% have policies about the use of AI (Robert & McCormack, 2025).

AI refers to computing systems that can engage in human-like processes such as learning, adapting, synthesising, self-correction, and data use for complex processing tasks (Popenici & Kerr, 2017). This definition may be outdated, depending on whether generative artificial intelligence (GenAI) is assumed to have arrived. GenAI is 'a form of AI that can autonomously generate new content, such as text, images, audio, and video' (Lv, 2023). Authors such as Kronblad et al. (2024) and Usher (2025) take a more sceptical approach to GenAI, especially when applied to fields such as business or journalism. Other authors, such as Bentley (2025), suggest that GenAI is a 'new revolutionary technology', while Miikklainen (2024) says GenAI is inaugurating a new era.

AI is an industry. The estimations as a market go from US $294 billion in 2025 (Fortune Business Insights, 2025) to US $758 billion (Grand View Research, 2024), the discrepancies depend on if the value of hardware, software and services is included or

[1] 'Higher education' and 'universities' do not mean the same thing. Universities are a type of higher education institution, while 'higher education' includes different types of institutions such as polytechnical, technical, vocational training, two-year and four-year and even research centres if they include undergraduate programmes. Higher education institutions can be public or private, for profit or not.

not. Moreover, there is a problem with access to this technology given socio-economic dissimilarities within and between countries. Gaps between higher education institutions in developed and developing countries might increase with the use of AI.

## The Future is Here

Since the twelfth century, much has happened with European-model universities, starting with the birth of the nation-state and then all the major social transformations that have occurred over the centuries – advances in agriculture, transportation, architecture, social organisation, science, art and technology. Universities today are places of knowledge construction, culture dissemination, teaching, research and socialisation. While they have changed over time, they continue to perform the same three main activities since their creation in the Middle Ages: teaching, producing knowledge and certifying the knowledge they impart. Over time, the development of autonomous or non-university accreditors has introduced new actors, but universities continue to accredit most of the student learning they oversee (Olds & Lubienski, 2010).

As a user of major large language models (LLMs), I have witnessed their fast progression, potential and limitations. The option 'deep search' and the reports it produces have replaced the work I delegate to a research assistant. As an exercise for this reflection, I asked some of the major LLMs – Claude, ChatGPT, DeepSeek, Notion, Perplexity and Gemini[2] – about their predictions for higher education in 25 years. I considered including some of their responses, but since LLMs develop so fast, I prefer only mentioning the key idea behind their broad responses: the future will be dominated by individualised teaching and personalised learning, with a strong emphasis on AI mentors.

The answers are not far from reality. Currently, AI tutoring models are becoming more prevalent at educational institutions. Examples are Khan Academy with *Khanmigo* (https://www.khanmigo.ai), the Chinese platform *Squirrel AI* (http://squirrelai.com/#/), *MATHia* by Carnegie Learning (https://www.carnegielearning.com/solutions/math/mathia/), and *Duolingo Max* for learning languages. In higher education, some examples are *ALEKS* (Assessment and Learning in Knowledge Spaces, https://www.aleks.com/?_s=8750619280018660), developed by the University of California, Irvine, and acquired by McGraw Hill; *Knewton* (https://www.wiley.com/en-us/education/alta) and *Jill Watson* (a teaching assistant created at the Georgia Institute of Technology). Other developments worth mentioning are the University of Michigan's *ECoach* (personalised feedback for STEM students, https://ecoach.ai.umich.edu/AboutUs/), Georgia State's *Pounce* (a chatbot for academic support and retention) and the University of Memphis' *AutoTutor* (https://www.memphis.edu/iis/projects/autotutor.php).

AI tutors are always available. This is another shift with respect to faculty. While open and online courses already offer this possibility, the feature of constant,

[2] The versions were ChatGPTo1, Claude 3.5 Sonnet, DeepSeek (DeepThink R1), Notion AI, Perplexity Standard and Gemini 2.0 Flash. The date I worked with the models was February 2, 2025.

personalised attention and adapting to students' individual paces creates a new scenario. The COVID-19 pandemic boosted asynchronous learning, which involves self-paced classes with access to immediate attention.

In a generation accustomed to fast-paced stimuli and engaging visuals and sounds, keeping people's attention is a great challenge in education. Although there is no definitive consensus on whether digital technology is 'good or bad' for attention, there is concern about how it will impact education at all levels, including higher education (Beland & Murphy, 2016; Cardoso-Leite et al., 2021; Deng et al., in press; Glass & Kang, 2019; Vedechkina & Borgonovi, 2021).

## Resistance to Change

At every technological turning point, especially the advent of television, the internet and massive open online courses (MOOCs), universities' future survival has been questioned. These innovations relate not only to learning and teaching processes but also to other changes, such as universities being surpassed by industries in knowledge creation and the development of patents or innovations.

Peter Drucker famously said: 'Thirty years from now, the big university campuses will be relics. Universities won't survive' (Forbes, 1997). Following his thinking, universities would die in 2027. Similarly, Clayton M. Christensen (2013) predicted, 'In fifteen years from now, half of US universities may be in bankruptcy' (quoted in Watters, 2016). This would be in 2028. Sebastian Thrun (2012), a pioneer of MOOCs with his company Udacity[3], expressed, 'In fifty years, there will be only ten institutions in the world delivering higher education. Udacity has a shot at being one of them' (quoted in Watters, 2016).

Beyond predicting their end, it is important to discuss whether the community between students and professors would survive the changes produced by AI or whether a new kind of institution would be developed given the rapid AI advancement. It goes beyond students using LLMs for assignments or faculty using them to complete tasks like translating, editing, clarifying or suggesting ideas. Teaching the best way to use prompts to receive better answers from AI will be insufficient. Higher education institutions must critically embrace technology and offer abilities and skills for a world with AI.

Modern universities demonstrate their value to society by educating the citizens and workers that society needs. In many ways, their usefulness depends on the value of their graduates. AI needs to prove its usefulness the same way. However, the signals shown by AI are mixed: AI is constraining the labour market and replacing jobs without offering a way to compensate (Roose, 2025). It is promising a better future in terms of scientific development or machines helping us with time-wasting activities such as driving (with self-driven cars).

[3] An American for-profit educational organisation.

## Optimistic View of AI

In the current debate on AI, there are two principal tendencies: the optimistic and the pessimistic. I will address both. Some possible positive aspects of incorporating AI into higher education include knowledge democratisation, decentralised education, lifelong learning, flexible curriculum, more sophisticated virtual collaboration, increasing internationalisation, research facilitation, more multimodal and multidimensional learning methods, micro-credentials, more sustainable education, improved soft and hard skills and the democratisation of mental health services (Marshall et al., 2024; The Chronicle of Higher Education, 2024). Another optimistic advantage I see is that academics will have more time to work on important activities, such as dedicating more time to work with students, because AI will manage less relevant and more tedious tasks. However, the paradox of the relationships between faculty and students is that the latter prefer working with AI personal assistants/tutors because they are flexible with time and can be personalised. Finally, AI can facilitate the acquisition of micro-credentials and teach the skills required to obtain them. This includes the likely creation of innovative programmes in disciplines that are currently difficult to imagine and the blending of traditional disciplines with AI training.

Another possibility is that AI makes higher education services cheaper. The price of higher education might decline if online and open alternatives colonise tertiary-level courses and services, but it is less clear whether increased AI use will help make universities more sustainable (Madabathula et al., 2025). According to some authors, AI incorporation will widen the gap between rich and poor countries (Capraro et al., 2024).

It has been said that AI will help solve not only scientific problems but also the most important problems affecting humans, such as climate change (Chen et al., 2023), poor healthcare (Bajwa & Munir, 2021; Burdick et al., 2020), low agriculture yields (Logeshwaran et al., 2024), poverty (Jean et al., 2016) and earthquake detection (Saad, 2023).

The more power AI companies have, the more governments or international organisations will attempt to regulate AI (Shein, 2024). This could counterbalance its power effectively. This has been the case in Europe (European Parliament, 2024), Africa (African Union, 2024), Asia (Association of Southeast Asian Nations, 2024) and Latin America (Cumbre Ministerial, 2023). There are interesting governmental initiatives: Canada (Parliament of Canada, 2023), China (Sheehan, 2023; Zhang, 2024), Korea (National Assembly of the Republic of Korea, 2024), the UK (Department for Science, Innovation & Technology, 2023), and the US, where the Trump administration has revoked President Biden's executive order regarding AI (Software Improvement Group, 2025). These regulations can affect the speed of AI development and implementation in higher education (and in general), but they seem necessary, considering the possible risks (Slattery et al., 2024) of its use in developing weapons and wars, as indicated, among others, by Geoffrey Hinton, the so-called 'Godfather of AI' (Metz, 2023; The Royal Swedish Academy of Sciences, 2024b).

## Concerns That Should Receive Attention

The main alarm is whether AI use might produce skills atrophy like thinking or creativity or relevant skills such as arguing, researching and writing (e.g. Kosmyna et al., 2025). Given inequalities in capacities, infrastructure and resources in countries and universities, some will not experience major changes soon. One notable change with AI's arrival is the probable substitution of people in the workforce. This could happen to staff or faculty in higher education. As AI continues to improve (Brennan et al., 2024), it is difficult to predict whether one of these tools could substitute for a higher education professor. There are already examples of programmes that have substituted teachers with AI, such as *Sabrewing*, which was piloted at David Game College (2025) in the UK and is an adaptative learning model 'with all core subjects being taught entirely by an AI-driven adaptive learning platform' to prepare students for the General Certificate of Secondary Education (GCSE).

There are initiatives to automatize every job (https://www.mechanize.work). Companies such as Artisan (https://www.artisan.co) offer to hire AI instead of humans to avoid the typical complications of working with people. Most of these initiatives are not preparing nations to deal with the new reality of losing jobs or offering alternatives for people to earn a living. This is not something that will happen soon, but AI is already impacting entrance-level jobs for young professionals in the labour market in the USA (Roose, 2025).

An important dilemma concerns the ethics of using AI. More students are using LLMs and other tools for school assignments. This represents a challenge in teaching the adequate use of AI in academic activities for students and teachers (Tertiary Education Quality and Standards Agency, 2024). Higher education institutions will lose the AI detection race even after spending huge amounts of money on trying. I conducted an experiment with two tools (Compilatio and Ithenticate) to detect plagiarism in a paper written 100% with "deep search" by Open AI. Both tools (the versions that include the revisions for AI material) detected only 1%–2% AI use.

There are already legal battles with some AI companies like OpenAI because they infringe the copyrights of authors, publishers and newspapers (Associated Press, 2024) to feed data into their systems. Moreover, AI has been criticised for its bias and reproduction of prejudices against women or minorities (Buolamwini & Gebru, 2018), as well as 'unfair discrimination and misrepresentation and exposure to toxic content' (Slattery et al., 2024). This can be extremely problematic for universities, both legally and ethically. As impressive as the "search the web" or "research" functions are in most LLMs, they maintain a major limitation: they cannot access to articles that are property of major editorial corporations; this limits deeply its scope.

Furthermore, AI hallucinations (inventing information and sources) can be problematic, not only in LLMs but also in other areas such as healthcare (Bhadra et al., 2021) or driver assistance systems (Nassi et al., 2020). Universities must be aware of AI's limitations and teach students to distinguish between facts and hallucinations. They must also develop protocols and rules for AI use. Some have already started (i.e., University of Toronto, 2025; Yale University, 2025).

The amount of energy required to use AI is an additional downside. A report by the International Energy Agency suggests that 'electricity usage by data centres will increase significantly in the near future thanks to the demands of AI and crypto currency'. The energy spent in 2022 in those areas was equivalent to the energy demanded by countries such as Sweden and Germany combined (Vincent, 2024). Microsoft already plans to reopen a nuclear power plant in Pennsylvania to power its technology, which includes its AI programs (Mandler, 2024). There are also calls for governments to regulate the energy use by these technologies, such as the statement signed by 100 organisations to demand that AI systems 'be made compatible with our planetary boundaries' (Green Screen Coalition, 2025).

## Final Remarks: The Universit-AI?

Scholars reflecting on higher education have coined different terms to define the higher education institutions that are emerging with social and institutional changes. Ben-David (1992) described the German research university as a 'revolution' in knowledge production. Kerr (1995) described it as 'multiversity', an institution that responds to many demands, unlike the mediaeval European university. Clark (1998) named it 'entrepreneurial university' to describe how institutions restructured their internal governance, diversified funding and nurtured innovative academic units to thrive in a market-like environment. If AI modifies the relationship between faculty and students, it will represent a change like the ones described by these authors.

Finding new names for these 'interactive learning spaces' will be among the least of universities' problems. What is critical is whether this transition will change the core of these institutions or whether they are prepared for the future independently of the names are used to define universities.

AI is transforming many aspects of society, including higher education. Ideally, universities will critically embrace this technology; discussed and not only adopted automatically. Nevertheless, there are concerns about the homogenisation of education or the fixation with a singular paradigm of learning or teaching. Perhaps the key is to understand that instead of fighting what AI represents, it is best that humans work with AI (Shao et al., 2025) to face these challenges.

The world is witnessing a period of significant change. However, while technology is progressing in one direction, political and ideological movements may alter its course. The LLMs I consulted predicted that in 25 years, there would be greater global integration in higher education thanks to AI through the creation of truly global classrooms without boundaries. This seems realistic, but many factors could hinder the better integration of countries and cultures. Supremacist ideologies are on the rise in different parts of the world, and these ideologies could be a constraint on AI advancement and its impact on higher education.

It is hard to refuse that this technology will profoundly change higher education; institutions must be prepared to face this new reality. More importantly, faculty and students, who are the reason these institutions exist, need to understand the AI

potential, risks and contributions. Universities must maintain the human bond between faculty and students, despite the changes AI brings. It is important to observe whether universities will preserve their agency by adapting and using AI or whether this agency will be diminished.

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## Acknowledgements

The author has made no acknowledgements regarding this publication.

## AI Statement

This article´s content did not include textual material from any Artificial Intelligence (AI) tool like a Large Language Model (LLM), but it used the 'deep research' model ChatGPTo3 by Open AI as a research assistant, mostly to find peer review sources and process the information from such sources. Other LLMs were used to test some ideas on the future of higher education as it is indicated in the reflection. The abstract was written partially by Claude (Opus 4).

## Funding

The author has not shared any financial support for the research, authorship, and/or publication of this article.