

Rethinking Higher Education in the Age of Embodied AI: From Techne to Phronesis and an Institutional Transformation Roadmap

Omer Ozturkoglu, omer.ozturkoglu@bcu.ac.uk, Associate Professor in Digital Transformation, Business School, Birmingham City University, Birmingham, UK

Abstract

This paper was triggered by the question “Can universities survive artificial intelligence (AI)?” posed in a conference and argues that this question is already outdated. I noticed that when educators and institutions debate AI, they remain trapped in a narrow, screen-bound imagination focused merely on LLM-based chatbots. Evaluated through a Deweyan pragmatic lens, this study critically examines how decades of neoliberal marketisation, customer-oriented audit cultures, and administrative risk avoidance have adversely affected the relational core of university teaching. Furthermore, expanding this pragmatic inquiry into evidence-grounded thought experiments, the paper details how Embodied (physical) AI tutors could fundamentally alter classroom delivery, continuous process-portfolio assessments, and 24/7 personal tutoring, while outlining the radical scenario of a “Big Tech University” established by unprecedented corporate computational, workforce and financial resources. The paper discusses that universities, which solely focus on transactional job-market training, will inevitably lose competition against the prospective Big Tech University. Therefore, it concludes that higher education must reclaim its foundational mission: cultivating the practical wisdom, moral judgment, and civic character through relational human interactions. Additionally, the study proposes a four-phase, stage-gated institutional roadmap— developing AI tutors and course assistance tools powered by locally hosted Small Language Models, collaborative robotic education, strategic inter-university consortia and total cultural transformation.

1. Introduction

Recently, we have been hearing many discussions regarding the use of AI in education and its wider effect not only on education but also higher education system. Even, in a conference I recently attended the speaker posed a provocative question titled “Can Universities Survive AI?”. I noticed once again that when educators talk about AI in education, they treat AI as if it is a piece of a text generator that writes essays, a chatbot that answers questions, a clever but ultimately limited tool confined to a screen that might threaten academic integrity but not much else. This narrow framing is not merely incomplete; it is strategically dangerous to be able to grasp its potentials and impacts. The AI landscape extends far beyond text generation tools trapped behind screens. Therefore, I have been feeling a bit uncomfortable not because of the concerns are invalid, but because they are partial and limited. The conversations are limited to LLM-based chatbots, generating essays or summarising texts. I believe the real disruption that could fundamentally reshape how universities teach, assess, support students, and justify their existence is rarely addressed by speakers and institutions.

In this essay, I attempt to widen the lens. The main idea here stems from my thoughts that the AI technologies most likely to transform higher education are not conversational LLM chatbots confined to screens, which lack any physical presence and which dominate many of the discussions in the sector, but the Embodied AI at the intersection of many emerging technologies such as robotics, edge computing, generative AI or AGI, and the big tech infrastructure. So, I am speaking of Embodied AI which is autonomous, humanoid, sensor-rich

entities capable of teaching in a classroom, observing a laboratory, providing pastoral care, and building relationships with students in ways that increasingly resemble, and may one day surpass, what human academics can offer under current resource constraints.

This may sound a bit futuristic or sci-fi, however I want to be clear about the kind of argument this article has. The scenarios presented in this article are not simple deterministic predictions but are pragmatic thought-experiments grounded in John Dewey's theory of inquiry (Dewey, 1938). I take this problematic situation: diminishing value of university education and the rise of intelligent machines. Then, I trace the possible consequences of the current trajectories. Therefore, this methodology is applied not to foretell the future, but to deliberately provoke the process of critical thinking and critical reflection. If some of what I describe reads as dystopian, that is deliberate. Hence, the point is to unsettle, because the evidence I see suggests that business-as-usual will not be sufficient.

The article follows several systematic stages. In Section 2, I begin with a brief historical and critical discussion of how university teaching has been reshaped over recent decades from the Socratic dialogue and the Andalusian *halka* to the neoliberal higher education system. I think this brief history is important because it shows that the pedagogical gap that could be filled by AI tools or Embodied AI in the future was not created by emerging technological revolution, actually it was created by us. Sections 3 through 5 then aim to explore evidence-grounded potential implications of Embodied AI for classroom delivery, assessment, and personal tutoring. I do not pretend these are neutral descriptions; they are intended to be unsettlingly plausible.

Section 6 addresses the ethical and regulatory risks that must be confronted if these technologies are to be deployed responsibly. Subsequently, Section 7 takes the argument further to its most radical and disruptive possibility: a Big Tech University built and operated by the big tech or commercial firms. The Section 8 presents a strategic roadmap for universities to mitigate some risks. I propose a stage-gated roadmap as a starting point for institutional strategy, not as a universal prescription. The conclusion section presents the concluding remarks to the initial inquiry: not whether universities will survive AI, but when they will structurally transform.

Throughout the article, I have used voice that is deliberately conversational and occasionally provocative. I would like to note that this is not a forecasting exercise, but it is a call for attention. The future of higher education is being shaped right now in laboratories. The choices we make or fail to make will determine whether the university remains a human institution or becomes merely a delivery mechanism for skills that machines can do.

2. From Socratic Dialogue to the Neoliberal Classroom

Throughout the human history, learning has been characterized as an endeavour requiring intense effort at both personal and relational levels. For instance, the Socratic method was not a technique for delivering content but a disciplined form of shared inquiry where knowledge was treated as something to be awakened through persistent questioning. Additionally, the master-apprentice tradition that flourished during the Islamic Golden Age and later in Andalusia featured learning circles known as *halka* *which* similarly grounded in continuous observation, imitation, and the gradual assumption of responsibility. Furthermore, Ibn Khaldun in his book *Muqaddimah* clearly described that a teacher's behaviour, moral stance, and way

of thinking are of central importance to education just as much as the texts being conveyed. Therefore, the ultimate goal was not merely to train competent practitioners, but also to systematically form wise individuals (Makdisi, 1990).

When assessing the limitations of this historically intimate model, it becomes obvious that such models could not be successfully scaled to mass populations. Therefore, the problem of scaling was structurally resolved by the Western university through a process of massification that encompassed large lecture-hall classes, standardized curricula, and, ultimately, the integration of teaching (first mission) and research (second mission). Particularly since the Humboldtian reforms of the 19th century, this connection has been meticulously structured to integrate the production of new knowledge with the education of students (Sporn and Godonoga, 2024). Hence, in this ideal system, students were to learn in an atmosphere of active investigation guided by scholars who engaged in original research.

Over the last several decades, however, this ideal has been profoundly reshaped, even in many places systematically eroded by the neoliberal restructuring of higher education. Universities have increasingly been asked to operate like businesses, and students have been repositioned as customers who purchase a service (Molesworth, et al., 2009; Brown, 2015). I think this marketisation did not occur in a vacuum. I think this was supported by legitimate and necessary safeguarding policies developed in response to historical abuses like discrimination, humiliation, and even violence against students. The expansion of institutional frameworks around vetting, barring, and pastoral care (Bichard, 2004) was a necessary and civilising advance.

Hence, the combination of customer-orientation and risk management has had unintended consequences. A wider culture of risk avoidance has taken root across institutions (Furedi, 2002; Ecclestone and Hayes, 2009). Content has been neutralised, and difficult conversations which might genuinely challenge a student's assumptions or cause temporary discomfort are systematically avoided (Lukianoff and Haidt, 2015). Moreover, the academic's role has shifted from challenging students to somewhat satisfying them. This is measured through instruments adapted from service marketing, by the way with an irony that it is hard to miss. Universities or third party service providers in charge of assessing student satisfaction have applied SERVQUAL-like models, originally designed to assess service quality in commercial businesses, with surveys that track customer satisfaction rather than genuine intellectual growth (Douglas et al., 2006).

Thus, it appears that the outcome, which can be easily seen across many universities, is a highly structured environment, where teaching and learning are increasingly driven by bureaucratic processes rather than intellectual passion. In the meantime, academics are unintentionally pushed toward the "deskilling" of academic teaching, which is a process in which the rich content of education is reduced to a series of tasks standardized to meet audit requirements, due to unmanageable student-to-staff ratios and the constant pursuit of funding or high bureaucratic processes (Deem et al., 2007), resulting in a reduction of the rich work of education to a series of standardised, audit-compliant tasks. Box-ticking activities are increasing and grade inflation increasingly masks a decline in the depth and rigour of student learning. For example, the Office for Students in the UK analysed degree classification distributions for the 2016–17 to 2021–22 period and found that the upward trend in "first-class" and "upper second-class" degrees had continued without full clear evidence of a corresponding increase in student achievement (OfS, 2023). Similarly, in the United States,

Wall Street Journal analysis of college transcripts confirmed that A-level grades have become the modal grade across most institution types, for instance the average GPA in Harvard had risen from 2.6 to 3.4 out of 4 between 1950 and 2003 (Mounk, 2024).

It would be unfair to imply that universities have done nothing in response to declining quality due to increasing standardization or massification. Over the past decades, many institutions have also invested considerably in more interactive and student-centred pedagogies such as active learning, flipped classrooms, problem-based workshops, case-study seminars, digital simulations, gamifications, placements, and internships (Ngalim and Selamat, 2026). Evidence from many research indicates that average student performance increases and achievement gaps for underrepresented students are reduced when these innovative approaches are well implemented (Ngalim and Selamat, 2026). However, the challenge is that these innovations require greater resources such as smaller groups, more tutor time, and better-designed learning spaces. I think these remain isolated islands of good practice and unfortunately, remain too limited in scale to successfully reverse the broader hollowing out of the curriculum.

When evaluating the real-world consequences, we also see a problematic gap between what higher education promises and what it actually delivers. For instance, the latest survey results have shown that employers in the UK are concerned that graduates still lack essential skills in problem-solving, creative thinking, people and personal skills, and the practical application of knowledge (Department for Education, 2025). Additionally, Eurofound reports also show that graduate skills mismatch needs of the businesses or organisations, demonstrating that employers struggle to secure the human capabilities they require (Weber and Adăscăliței, 2024).

What we are observing, then, is not a sudden crisis presented by AI, but the progressive weakening of the relational and intellectual content of university. Therefore, in this context, many managers in the future may not see Embodied-AI, which can provide a multi-sourced, multi-sensory learning environment and continuous support and assessment, as a threat but a pragmatic and attractive solution, even students may like it as a solution.

3. Classroom Delivery by an Adaptive, Multi-Sensory Embodied AI

In this section, let me paint a concrete picture, which is hypothetical and even dystopian in flavour, but by no means it is impossible how Embodied AI could reshape classroom teaching. Here, my intention is not to describe the distant future but to synthesize various capabilities that are already emerging in laboratories, pilot projects, and commercial products and to show how the integration of these capabilities could develop a pedagogically aware Embodied AI for classrooms.

In early 2026, during China's New Year celebrations, humanoid robots developed by Chinese firms performed complex martial arts routines demonstrating balance, coordination, and real-time physical adaptation that would have seemed impossible five years earlier. Some car manufacturers like BMW and Toyota and assembly plants in China already integrated Embodied-AI into their manufacturing process along with human workers (McManus, 2026; Cuthbertson, 2026). To pass the next Turing test to identify if humanlike body is a human or a humanoid (Sohn, 2024; Li et al., 2026), there are growing body of research and commercial activities. For example, researchers have been developing electronic skins embedded with

sensors to detect pressure, temperature and texture for over a decade (Chortos, Liu & Bao, 2016), and fully synthetic muscle and skin systems are being developed to mimic human-like tactile interaction (Clone Robotics, 2026). Furthermore, the capability to mimic human micro-expressions in real time is progressing with a high speed with the help of technology giants like Microsoft's VASA-1 project, which is capable of auto talking faces with realistic micro expressions and head movements (Xu et al., 2024). When these capabilities are combined with a humanoid platform like Engineered Arts' Ameca, the world's most advanced social humanoid robot for now, with the integration of highly advanced conversational AI allowing multi language skills, natural eye contact, facial responsiveness (Engineered Arts, 2025), the result could be an entity which will be difficult to be distinguished from a human tutor and provide an human-like experience to students rather than distract them.

Inside the classroom, this type of Embodied AI's capabilities could go far beyond what a well-prepared lecturer can offer. Because it can also process multiple streams of information simultaneously, it can monitor every student's level of engagement in real time. For instance, this type of technology has already been piloted in Chinese schools, where eye-tracking and attention-monitoring systems were tested and used to measure student focus (Knox, 2020). Hence, the AI successfully senses when a student is drifting, confused, or bored. It does not need to guess. It sees the data and can act on it in seconds.

And what may this acting look like? It could instantly generate a personalised example based on a student's cultural background or a recent trend in social media that students reposted or liked. It might come up with a joke tailored to regain attention without offending anyone based on ethical principles and student's profile. It could throw a tailored Kahoot-style question onto the screen, pull a relevant YouTube clip, or design and deploy a short interactive game. Imagine all these could be executed within minutes, which is far beyond the capacity of human tutors. I am not speculating about superintelligence here. These are tasks that current AI models can easily handle when appropriate access to content libraries is given. Rich visualisations like colourful graphs, charts, images even animated diagrams can be created on the fly (please see GPT6 at <https://openai.com/index/gpt-6-astra/>). Even, if preferred, the AI's vocal accent can be intentionally changed to break monotony. The range of interventions to enhance engagement is vast and still growing, and they can easily operate them without fatigue.

There is a further dimension of emotional awareness AI could enhance ethically. Suppose that students and the Embodied AI are friends in social media allowing access to their posts, the AI could briefly review their recent social media posts before a class session to have an understanding about their general mood. Because the computational analysis of emotional expression is now a mature field with validated tools capable of inferring psychological states from texts (Boyd and Schwartz, 2022). The novelty here is not the sentiment analysis but its integration into physical AI that can adjust its behaviour accordingly. For example, a student who has shared sad news might be approached more gently, whereas a family celebration could be warmly acknowledged. In contrast, we as human tutors rarely knows what has happened to a student unless the student chooses to share it. Hence, the Embodied AI operating under ethical and responsible principles will have potential to have a class with a more nuanced human-like awareness of its audience.

In many cultures, speaking up in class carries genuine social risk which is one of the significant barriers for student's engagement. A recent review and a qualitative research on East Asian international students confirms that fear of losing face, language anxiety, and unfamiliarity with

Western seminar norms remain significant barriers to oral participation even in the present day (Ali, 2025; Liu and Li, 2026). Similarly, fear of negative evaluation remains an important barrier to students' verbal participation and classroom engagement even in western universities because of fear of judgement (Severe et al., 2024; Busch et al., 2023). Many educational institutions have been offering anonymous digital polling and backchannel platforms to address this problem giving quieter students a voice (Stanley, 2021). An Embodied AI classroom can take this much further. It can offer a completely anonymous channel through which students submit questions using a simple online form on their phone or laptop. Because the AI is capable of processing inputs in parallel, it can read, prioritise, and address these questions in real time without ever pointing to the student who asked them. It can respond verbally in a way that integrates the question naturally into the flow of the class. I believe this is not a small technical feature, but it is a mechanism that could fundamentally alter student engagement for those who prefer to speak up or who chose to remain quiet and invisible.

Finally, these capabilities together could create a richer, more responsive and more personalized classroom environment than many traditional classes, particularly the large group lecture halls. In this setting, the AI does not simply deliver content, but also it reads the room, adapts in real time, draws on a wide range of digital resources, and attends to each student with a level of consistency no human can easily match.

4. From Portfolio to Process-Folio Assessment supported by AI

Classroom delivery is only one part of the teaching roles. Designing state of the art assessments, evaluating student works, providing formative and summative feedback, and reporting outcomes and other documents required for accreditations or quality management processes need an enormous, labour-intensive effort, particularly in well-structured universities. Evidence shows that academics, who are constrained by time, workload and institutional pressures, struggle to meet the demand for timelier, high quality and personalised feedback. Advance HE in England's 2024 report confirms this that nearly 50% of students receive feedback but on average 35% was satisfied by the quality (Neves et al., 2024). Additionally, while the expectation of students to get feedback is one week, the report shows that the actual time is on average 2.5 weeks given that average number of assessments have increased from 2 to 3.7, almost doubled, between 2017 and 2024. Thus, students have increasingly turned to AI chatbots to seek continuous feedback, draft assignments, generate reports, create presentations even with transcripts particularly for the last 3 years (Zhan and Yan, 2026). In response, some universities like Cambridge announced to retain or reintroduce oral or handwritten, invigilated in-person exams to mitigate the unethical use of AI chatbots for assessments, indicating a defensive response rather than a viable long-term strategic position, that necessitates more fundamental redesign of assessment (Kofinas et al., 2025; Urquhart and Ngo, 2026).

When assessing the alternative paradigm that Embodied AI makes possible, there is a potential shift from traditional static portfolio assessment to continuous Process-folio assessment, which captures student's entire learning journey in real-time. The process-folio,

as originally articulated by Howard Gardner and colleagues at Harvard Project Zero, is “a record of the steps through which a student has gone in arriving at a product,” documenting the *development* of understanding rather than merely its terminal outcomes (Gardner, 1993, p. 109).

Imagine that digital twin of the Embodied AI educator is available to students 24/7 by email or video call based on autonomous booking systems. With the help of parallel processing, the AI could serve many students simultaneously and provide feedback in written, spoken or visual formats tailored to each student’s comprehension level, cultural context, personal interests, or even in their native language. As mentioned previously, this is not a futuristic fantasy because the core technologies like real-time speech synthesis, natural language generation, computer vision, and personalised recommendation algorithms are already operating in production systems from big tech companies like Google, Microsoft, OpenAI and Tencent.

With Embodied AI and its digital twin, real-time observation and recording become feasible across multiple environments simultaneously. For example, within a laboratory where each student works alongside a dedicated AI observer/assistant that watches and records activities, notes how they progress and where they hesitate, identifies errors as they occur, and provides immediate, constructive guidance without judgement but support. It allows students to make reasonable unrisky mistakes and learn from them in the moment with real-time feedback tailored to their profiles. For students who need more challenge, it could provide extension activities. For those struggling, it could offer additional scaffolding. Additionally, this same setting can be applied beyond the laboratory environment. A student’s participation in classroom discussions, online forums, group interactions, and out of campus activities can be recorded and integrated into a personalized, evidence-based process-folio journey. Hence, each student’s performance could be systematically evaluated based on consistent personalized criteria ensuring that the assessments are fair and free from the unconscious biases when necessary safeguarding policies are provided.

As a result, the main bottleneck of human workload can be systematically relieved to successfully transition to multi-layered, continuous personalised process-folio based assessment system designed specifically to the student’s profile in line with the learning outcomes and objectives can be realised.

5. Reimagining Personal Tutoring with AI

In addition to teaching and assessment, many academics serve as personal tutors or student advisors. They provide career coaching and pastoral care. In universities with highly diverse international student populations, this role requires great cultural sensitivity, even legal/policy awareness, and emotional resilience. Although many experienced academics can manage many situations well, even some of the most skilled may encounter various overwhelming situations and challenges that could cause legal or health related issues (Alberts, 2025).

A specifically trained AI chatbots powered by Constitutional AI frameworks that strictly govern ethical behaviour (Bai et al, 2022), is possible to act as a coach or personal tutor. I think the current technologies previously presented makes this scenario even more possible in the near future. I think it is only a matter of time before we see controlled personal tutor assistances based on AI chatbots. Once they are realised, they can provide the following services a human personal tutor may not easily match:

- Analyse a student's family background, educational history, current performance data, and stated aspirations to generate a truly personalized development roadmap using data available at university databases or from the 1-2-1 interviews with students.
- Communicate in the student's native language when needed, eliminating the comprehension barriers that sometimes distort sensitive conversations.
- Maintain 24/7 service with an infinite patience. There is no rush, no frustration, and no bad day at work while employing professional and culturally aware language to avoid misunderstandings.
- Recognize when a situation exceeds its competence and immediately signpost to a university office based on policies and procedures.
- Better conversation and emotional support particularly for individuals with mental health challenges or neurodivergence (Huang, et al., 2026).

6. Ethics and Safeguarding

The scenario I have described so far particularly in the previous section, inevitably raises concerns about privacy, ethics, and data protection as it always appears in any AI projects. Any concerns regarding data collection, recording and processing from various platforms are legitimate and must be addressed directly.

First, I would like to note that trust in this system is foundational. There are some evidence that young and adult peoples already show their trust to general AI chatbots. For instance, a survey results conducted by Youth Endowment Study indicates that more than 25% of young people in the UK directly use AI chatbots for emotional support and advice (Youth Endowment Fund, 2025). Another recent study also showed that nearly half of UK adults use chatbots as a counsellor (Yankouskaya et al., 2026). Adults increasingly turn to AI for advice on relationships, career decisions, and mental health (Ueda et al, 2026). These studies show that many people are already comfortable with, even in some cases they prefer, sharing their personal information with AI. As news, academic studies and reports have highlighted, the risk is that young people even adults may receive harmful guidance in uncontrolled environments (McCallum, 2025; Olsen et al., 2026).

To my opinion, the solution is not to reject or ban AI chatbots but to implement it within carefully designed controlled environments. An Embodied AI tutor operating in a university setting could run offline during teaching hours. Before or after class, it can be given limited and monitored online access for specific functions like emails and scheduled meetings. It should operate under Constitutional AI frameworks where ethical guidelines that govern its behaviour, limit its responses, and ensure that it approaches relevant university offices when sensitive situation is noticed. Student data would be stored locally on the device and in university-secured databases, subject to the same GDPR compliance mechanisms already in place for institutional systems.

Most importantly, like in 360-degree evaluations, the students could also have signalling mechanisms like feedback channels through which they could send their concerns, request human intervention, or report their discomfort in a way that Embodied AI are not allowed to access.

7. The Radical Disruption by The Big Tech University

In previous sections, I have attempted to examine how Embodied AI could reshape classroom delivery, assessment, and pastoral care within existing higher education institutions. But I think there is a more radical possibility that could totally disrupt current higher education sector: what if the universities are replaced by entirely new educational ecosystems built and operated by the very technology giants that are developing these AI capabilities? I believe this scenario deserves to be taken seriously reminding what Elon Musk said at a conference in 2020 “I think college is basically for fun and to prove that you can do your chores, but they’re not for learning.” Nowadays, Elon Musk is not the only influential person who criticizes the diminishing value of current university models (Fore, 2026).

Let me begin with the economic asymmetry that makes this scenario thinkable. On one side, western universities like UK universities, particularly in the humanities, social sciences, arts and even engineering, are facing declining student interest, financial challenges, and waves of programme closures and staff redundancies (HESA, 2026; OfS, 2026). On the other hand, there are few technology companies that have reached massive market valuations, which is more than the annual GDP of most of the world's economies. For example, as of today (July 2026), NVIDIA, Apple, and Alphabet each has a higher market value than any country outside the G7 (Companiesmarketcap.com, 2026; Worldometers.info, 2026). Individual founders like Elon Musk, whose personal wealth is nearly one trillion USD as of today (July 2026), has more financial resources than many single universities (Bloomberg.com, 2026).

Furthermore, the top 10 companies that have largest market capitalisations (Companiesmarketcap.com, 2026) including Tesla, SpaceX, Meta, TSMC, Amazon and Microsoft as well, are not only rich but they already own much of the technological and computational infrastructure that digital systems depend on: cloud computing, AI, chips, data centres, social media platforms, virtual and augmented reality hardware, space tech, physical robotics and very advanced manufacturing and distribution. Given their massive tangible and intangible resources such as highly talented engineers and scientists with PhDs, I believe the real question is not whether they have the sufficient capacity and competence to build a global educational institution or simply university. In my opinion, the real question is what would happen if Elon Musk or some of these companies were to collaborate to build a globally recognized higher education institution.

Now imagine a Big Tech consortium or even a single tech giant that decides to establish its own higher education institution. This could be a fully-fledged university which offers full and short courses with degree awards, staffed by Embodied AI tutors and assistants previously described, and equipped with facilities that many current traditional universities could match.

Let me go a bit further and trigger your imagination. This university does not have to be constrained by a physical campus. It can offer learning environments that blend the physical and the virtual environments. For instance, while students are guided by highly talented human experts and supported by Embodied AIs and dedicated AI assistants that observes, guides, and documents their progress in real time in physical campuses, students could also conduct experiments in labs, attend additional classes, observe real operations in a digitally enriched environments and in a metaverse using digital twins of real factories. For subjects where physical presence matters like robotics, healthcare, advanced manufacturing, the

corporation's own industrial sites become the training ground, with placements built into the curriculum.

Additionally, the networking and socialisation dimensions of universities, of which they are key selling points, would be fundamentally reimagined. Big Tech University can design intentionally inclusive networking environments rather than crowded career fairs social events where highly self-confident and social students could get the most benefit. In the metaverse or physical spaces, Embodied or AI-powered assistants could support quieter and more reserved students, and facilitate engagements. Hence, these students, some of whom may be highly intelligent, might find themselves in an environment that offers them greater opportunities or one they enjoy more, rather than in a setting where dominant personalities typically monopolize conversations. Their behaviours such as collaboration, constructive contribution, and respect can be systematically observed and incorporated into the process-portfolio assessment framework I previously described. I need to note that this is not an endorsement of the Chinese social credit system, which raises serious ethical concerns, but a recognition that technology already exists to structure social interactions in educational settings more equitably. In an optimal environment, this system could have potentials to reduce the bullying, discrimination, and unconscious advantage that adversely affect networking opportunities in many university settings.

So, what could prevent such an institution from gaining legitimacy? Maybe we can assume that the key stakeholders of current higher education systems including regulatory authorities, accreditation bodies, examination boards, and unions would initially take a conservative and defensive approach and refuse to recognise degrees given by them. It is understandable that they might have a desire to preserve conventional institutions and standards. However, I believe that new players with very strong financial resources can easily satisfy or overcome regulatory barriers especially considering that the current education policy environment is already shifting their favour. The European Union's 2022 Council recommendation on micro-credentials explicitly encourages the recognition of learning outcomes acquired from non-traditional providers, which actually indicates that regulatory barriers are being reduced (The Council of the European Union, 2022). If they face a strong obstacle by quality assurance agency in one country, they can find a country that is eager to attract investment from the big-tech consortium and willing to authorise their application, as it always happens in commercial world. Eventually, do you think that decision makers in developed countries could reject a degree awarded by an institution that exceed their minimum own standards and that is backed by the financial and political weights of a global technology and commercial giant?

I think the true strength of this scenario lies not in what regulatory bodies can do, but in what students will choose. Let us consider a young person interested in business, engineering, technology, or even a health-related field. They are offered two options. The first is a traditional low- or medium-ranked university with a stretch budget, overloaded academics, limited laboratory access, variable teaching quality, and a careers service that can offer only advice but no solid routes to market. The second is a "Big Tech University" that is powered by both expert professionals and specially trained expert Embodied AI and AI assistants, unlimited laboratory time in both physical and virtual environments, a network of industry connections integrated into daily experience, and a competency certification that opens doors directly to the world's most dynamic companies. In fact, small-scale seed investment could even be provided to student ventures that meet the appropriate criteria while their education is still

ongoing. Additionally, there might be always an opportunity for them to implement these innovations within the consortium or tech giant's companies or their networks.

To be clear, even if Big Tech University do not claim guarantee employment, their credentials backed by their names with enormous weight in sectors would function as a powerful signal in the labour market. Job placement opportunities, a networking environment, and the vast resources offered would even make this offer extremely attractive to prospective students.

8. A Strategic Roadmap on What Universities Must Reclaim

8.1. From *Techne* to *Phronesis* with the Human Core

The main argument behind the discussions presented in the previous sections can now be clearly stated. If higher education is understood primarily and solely as the acquisition of transferable and employable skills, called ***techne*** (skill, art, craft knowledge) by Aristotle, I think many universities and colleges, with the exception of those are globally prestigious or hold a niche position at the local level, is highly likely to lose their competitive advantage against Big Tech University unless there is a significant difference in tuition fees. Because Big Tech University powered by latest technologies and Embodied AI could provide vocational training in more personalised, scalable and directly linked to employment, resource constrained universities will be left behind.

However, as briefly noted in section 2 that education has never been exclusively focused on *techne*. Instead, it has historically prioritized cultivating the whole person by systematically developing the capacity for practical wisdom, moral judgment, and participation in social life on an ethical basis. For instance, Aristotle distinguished *techne* from ***phronesis*** (practical wisdom, the ability to reason accurately about what is good and beneficial for a good life) and ***episteme*** (scientific knowledge) and noted that while a carpenter requires *techne*, a citizen needs *phronesis* (Aristotle, *Nicomachean Ethics*, Book VI). Additionally, historical practices such as the Socratic method and the Andalusian *halka* were not only for transferring knowledge but also they functioned as collaborative inquiry process in which ethical behaviour, intellectual humility, and the patience for sustained reflection were actively modelled and absorbed by students through continuous and close interaction (Makdisi, 1990).

When these historical traditions are carefully reviewed, it becomes evident that being professional and competent and becoming a wise human are not separate, but intertwined. An Embodied AI can be trained on every textbook, case study, and research article ever written. It can even be programmed to simulate empathy, patience, and cultural sensitivity; however, it cannot draw upon a life truly lived. It has never encountered any moral dilemma that demanded a price from it. It has never faced personal dilemma where it had to choose between personal interest and moral values, or even between conflicting obligations to different individuals. Even it has never experienced regret or forgiveness or difficult work of changing its mind. Hence, we can say that AI can attempt to model wisdom but can it really possess it? Wisdom cannot be easily represented by a dataset because it is a residue of a life examined.

The distinction between competency and wisdom is existential for university education. Therefore, I think while competing on *techne*, although it will be very difficult to compete with Big Tech University on cost, scale and personalisation, the universities should reclaim and

deepen their commitment to phronesis. This never means that *techne* (skills) is abandoned but it means that reducing the whole university education to vocational education needs to be refused. Hence, it means that universities should design courses and environments in which students can acquire not only employable skills but also can learn what it means to think correctly, act responsibly and care about things that cannot be measured in monetary terms through close contact with academics. And right here, true institutional transformation occurs not by competing with AI on the delivery of *techne*, but by strategically developing and deploying (embodied/screen bound) AI systems to handle transactional instruction while liberating and augmenting human academics to focus on what matters most: the patient, relational cultivation of *phronesis*.

8.2. A Stage-Gated Institutional Transformation Roadmap

The recommendations below are structured using a phased, stage-gated approach similar to the maturity models employed in digital transformation strategies (Kane et al., 2015). Each stage builds upon the previous one. It can be recommended that institutions review their existing capabilities and capacities, then enter the process at the stage that aligns with their current stage.

Phase 1: Foundation—Building Trusted, Local AI Tools

The first and most critical step is to develop AI tools that are under institutional control. The commercial, general, cloud-based LLM-based chatbots raises unresolved questions regarding privacy, data protection, hallucination, and pedagogical appropriateness. Instead of using these tools, although the cost of training models is quite high how at the moment, universities should invest in subject-specific, locally hosted Small Language Models (SLMs) while the training costs are going down or agentic AI systems designed exclusively on specific modules/courses using assessment briefs, and exemplars of good, average, and poor student work. Subsequently, such tools can also be equipped with voice interaction capabilities and deployed as **Course Assistance Tools** to provide 24/7, on-demand support to students in a controlled, curriculum-aligned manner (Mollick and Mollick, 2023).

Simultaneously, an **Assessment Support Tool** should be developed. This tool also needs training on the same course materials and especially on the course's marking rubric, learning outcomes, and past best anonymised feedback reports. This tool could provide 24/7, immediate, formative feedback on drafts iteratively to help students improve their work. Hence, we can begin to make the process-folio approach feasible. Every draft, every revision, every improvement can be recorded to provide evidence to student's progress on their assessment.

Additionally, a **Personal Academic Tutoring AI** can be developed and implemented to offer 24/7 personalized guidance. This tool can be trained on or utilize institutional policies, Constitutional AI frameworks, students' attendance records, grades and background while operating under strict human or even AI oversight. With a student consent, it could even integrate limited social media or wellbeing data to provide more contextually aware support. Of course, this should always subject to ethical approval and continuous student feedback. Furthermore, sensitive decisions carrying legal or safeguarding implications must be flagged and directed to the right institutional office and human experts. The AI tool can function only as an alerting and triage system (Hobert & Meyer von Wolff, 2019). Hence, these tools should

be run on local infrastructure to ensure rigorous GDPR compliance, and they need to be initially implemented with pilot programs in a department before wider rollout.

Phase 2: AI Integration

Once the foundational tools developed at Stage 1 are validated, the next stage is to integrate them into the daily workflow of teaching and learning. Under the supervision of a human instructor, the Course Assistance AI Tool can deliver a part of a class session either before the class or during the session, for instance the first thirty minutes of a lecture, and cover core content, while the instructor observes and intervenes when necessary. Students can ask questions verbally or through an anonymous digital form. The AI can respond those questions in a written form allowing anonymity or verbally in real time without disrupting the flow of the session. At the end of each session, feedback can be collected from both students and the instructor so the tool can be continuously refined.

This phase is the beginning of what I would like to call “**collaborative robotic education**” in which AI is used not simply to automate educational tasks, but increasingly to augment human teaching. At this phase, AI tutor can handle the repetitive and routine tasks like delivering standardised core content, while human academics can concentrate on activities in which human judgement and interaction are important such as facilitation, critical discussion, interpretation, mentoring and the improvisational aspects of teaching that respond to learners and situations in real time. Hence, this collaborative model utilizes both automation and augmentation capabilities rather than replacing human tutors by AI tutor. Both AI tutor and a human tutor can present their unique strengths and combine their capabilities to educating learners in a redesigned education workflow. Over time, the AI-enabled assessment and personal tutoring tools also need to be integrated into standard workflows. In my opinion, these tools should not be considered as optional but the integral parts of new educational experience. Hence, the objective is not simply to introduce more AI tools into education, but to redesign the educational experience around **what AI can automate, what AI can augment, and what should remain fundamentally human-led.**

Phase 3: Strategic Positioning

When universities successfully establish their internal AI capabilities, they need to prioritize building external partnerships proactively to build robust strategic positioning in the sector. For example, strategic partnerships should be established with technology and commercial companies, especially and whenever possible with major technology or large-size firms, to develop joint programs and co-branded credentials to mitigate the risks of radical disruption. Moreover, inter-university collaboration is strictly recommended to co-design, co-develop and share the tools described in Phase 1. A consortium of universities could pool their expertise, resource, and development costs, and build AI tools that are collectively owned. I think these could be superior to any tool a single university might offer.

In a worst-case scenario where a Big Tech University formally emerges and a university's institutional capacity efforts do not keep pace; I would like to recommend franchising and delivering a Big Tech-designed curriculum under licence while maintaining localisation and

human touches and responsibilities in formative education. This may not be ideal for universities, but it is preferable to obsolescence.

Finally, universities could explore building their own metaverse environments where invited alumni could participate as mentors. These can be designed around academic values with accessibility, inclusivity and of course pedagogical purposes.

Phase 4: Institutional Transformation

As is always the case with any transformation project, the final stage is not technological adoption, but cultural transformation. Every tool previously proposed aims to provide continuous high-quality support to students while freeing human academics from transactional and repetitive task so that they can concentrate on more value-added activities and what matters most in teaching and learning: the slow, patient cultivation of practical wisdom.

In conclusion, I think current curricula need significant improvement to integrate ethical reasoning, intercultural competence, critical thinking, and civic responsibility as core modules. Additionally, it is also crucial to create physical and temporal spaces like seminars, labs, retreats, project-based studios where students and academics could easily work together in sustainable and relationally rich environments that AI cannot replicate. In doing so, of course, it is necessary to restructure academic workloads and reward systems so that mentorship, pastoral care, the transmission of intellectual virtues are valued at least as highly as some level of research outputs. Finally, it is necessary to publicly declare to all of the stakeholders - students, parents, employers, and governments - that the purpose of the university is not merely to produce employable graduates, but also to prepare citizens capable of shaping a fair and sustainable future.

I acknowledge that these recommendations are not novel. In fact, they represent an updated call to return to the oldest mission of the university in an age of intelligent machines. What is new here is the urgency of the situation. Universities that are already taking necessary steps such as building local AI capacity, establishing strategic partnerships, and reinvesting in the human element will not only successfully navigate this radical transformation but also play a role in shaping the future structure of higher education.

9. Conclusion

This essay began with a simple panel question: *Can universities survive AI?* I have argued that this question is already outdated because of the lack of wider imagination of the future implication of emerging technologies and AI. I also attempted to uncover what the real challenge or threat is. The real challenge is definitely not the AI chatbot that writes an essay, but the physically embodied, pedagogically trained, economically compelling human-like AI tutors. Hence, throughout this essay, I have tried to trace the consequences of that trajectory with pragmatic honesty and come up with more important questions we should ask: “when will universities structurally transform, and what will they need to become if they are to remain valuable in the age of AI?”

If higher education ecosystem continues to limit its value proposition to the delivery of standardized content, the certification of employable skills, and the provision of customer

satisfaction to fee-paying students rather than positioning them as learners and our future, its traditional value proposition becomes increasingly vulnerable in an age of AI. One day, a Big Tech University, equipped with Embodied (physical) AI, unprecedented technological, immersive technologies, vast computational, infrastructural, financial and highly skilled workforce resources, may build educational alternatives that are more personalized, scalable, adaptive and directly linked to transferable employable skills.

I attempted to conclude that the strongest response is not to compete with AI at what it could do best, but to reclaim what education is fundamentally for: the pursuit of wisdom; the raising of citizens with moral and intellectual capacities, including reasoning capacity, and the preparation of citizens capable of shaping a shared future. At the same time, from a Deweyan pragmatic perspective, universities should transform their institutional practices by leveraging the best opportunities offered by emerging technologies, while also evaluating the value of these technologies based on the extent to which they support meaningful experience, inquiry, learning, and continuous human development.

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