

FORGING THE FUTURE OF HIGHER EDUCATION IN THE AGE OF AI, GREEN TRANSITION AND GEOPOLITICAL FRAGMENTATION

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Abstract

This position paper examines the critical confluence of the Artificial Intelligence (AI) revolution, the urgency of the Green Transition and the emerging geopolitical dynamics. It analyses their influence on the future of youth education. It is argued that preparing the next generation requires a curriculum reform that transversally integrates advanced digital competencies, deep understanding of sustainability, and strong interdisciplinary capacity. Simultaneously, we analyse how contemporary geopolitical tension, including fragmentation and competition for technological hegemony, directly impacts international academic collaboration, restricts student and faculty mobility, and reshapes relationships between academia and industry. We propose that Higher Education Institutions (HEIs) adopt a strategic and integrated approach, not only to adapt their curricula to technological and environmental demands but also to proactively navigate a changing geopolitical landscape. This entails innovating internationalization, developing resilient educational models and forging new alliances to ensure the training of globally conscious, technologically competent and ethically responsible citizens capable of leading in an intrinsically interconnected and complex world.

Keywords: *Future of higher education, Artificial Intelligence (AI), green transition, geopolitics, science diplomacy.*

1. Introduction

“The old world is dying, and a new world struggles to be born; now it is the time of monsters.” (Antonio Gramsci - 1930).

Current disruptive changes, the emergence of non-human intelligence (AI), the climate crisis and shifting geopolitical power dynamics— demand transformative rather than transactional responses. AI now extends professional efficiency while entering unprecedented competition with human intelligence. Simultaneously, climate change is putting ecosystems, human lives and economies at risk around the world.

Higher Education Institutions (HEIs) are at a critical juncture. It is no longer sufficient to address these challenges in isolation; a holistic, "systems thinking" approach must replace traditional silos. This paper argues for fundamental reform: i.e., integrating advanced digital and sustainability competencies across disciplines, fostering transdisciplinarity, and innovating in internationalization to navigate geopolitical volatility. Proactively shaping this new educational model is vital for universities to remain relevant bastions of knowledge and integrity.

2. Argumentation

The future success of individuals and societies depends on their ability to navigate a world profoundly transformed by technological advances and environmental imperatives, all within a volatile geopolitical context. Therefore, the core of our argument lies in the imperative for higher education to undergo a profound transformation in four key areas: reforming curricula focused on future-ready skills, adapting models of international collaboration in response to geopolitical changes, redefining the relationship between academia and industry, and revisiting HEIs societal and science diplomacy's involvement.

2.1. Curriculum reform: Forging future-ready competencies

Traditional, compartmentalized curricula are ill-equipped for the AI era and green transition. A radical shift is required to integrate transversal digital skills and sustainability literacy across all disciplines.

Integrating AI and Digital Skills Beyond STEM

Digital literacy must become a core competency. Automation increases the demand for abstract problem-solving, critical thinking, and social intelligence (World Economic Forum, 2025; Autor, 2003). UNESCO emphasizes "human oversight" as well as transparency and fairness in AI ethics (UNESCO, 2021). Critical discourse is needed to ensure AI supports sustainable pedagogy rather than take over its control (Popenici, 2022). Currently, only 23% of companies have robust AI ethics guidelines (IBM, 2023), indicating a gap in professional practices that education and training must address.

Embedding Sustainability as a Core Competency

Sustainability must be a fundamental pillar of HEI, including systems thinking and circular economy principles (Nguyen et al., 2025; Sterling, 2001). Key competencies include anticipatory, normative, and strategic interpersonal skills (Brundiers, 2010). By 2027, 44% of citizens' core skills will be disrupted, with "green skills" being a high-growth category (World Economic Forum, 2023).

Fostering True Interdisciplinarity

Complex problems like climate change and AI governance defy single-discipline solutions. HEIs must break down departmental silos and promote cognitive and interpersonal competencies (Davies, 2011; National Research Council of the National Academies, 2012; Repko et al., 2012). An example is the Hong Kong University of Science and Technology (Guangzhou), which uses a "Hubs and Thrusts" structure (Function, Information, Systems, Society) to replace traditional schools (The Hong Kong University of Science and Technology, 2025).

2.2. Navigating geopolitical fragmentation: Redefining internationalization

The imperative for educational adaptation is intrinsically determined and challenged by the current geopolitical situation. Growing polarization, trade tensions and conflicts directly impact the traditional pillars of international education, requiring a strategic re-evaluation of international collaboration, student and faculty mobility, and academic-industry relations. They remain crucial to acquire collaborative skills and multicultural awareness. The approaches to technology and ethics are culturally dependent; for example, China prioritizes societal harmony while the EU focuses on individual autonomy and privacy (Fung, 2022).

International Collaboration Amidst Distrust

At the societal level, neoliberal ideology has caused unrestrained competition—a kind of fundamentalism based on return on investment—that breeds a lack of personal recognition and distrust. At the individual level, connection has been lost, stemming from a lack of trust in others, which in turn arises from the absence of transcendent goals. This breeds fear, resulting in overregulation that causes loss of autonomy, polarization, and ultimately loneliness... in a world where the "bandwidth" of communications infrastructure has never been greater. In this context, international collaboration is essential for global research and diversity of thought. However, it faces obstacles from certain social circles due to mistrust, security concerns and national agendas. Universities must seek regionalized alliances or multilateral partnerships focused on shared challenges like climate change (de Wit, 2020; Moscovitz & Sabzalieva, 2023). The European University Alliances program exemplifies this by forging deep, transnational "inter-university campuses" to enhance competitiveness and common values.

Responding to Restrictions on Student and Faculty Mobility

Student mobility is the most vital factor in internationalization (Agarwal, 2008; King, 2010), but it is increasingly influenced by geopolitical tensions and "migration management" models (Mok, 2024; de Lange, 2025). Institutions must expand transnational education via hybrid programs and regional "hubs." During 2020-2021, physical mobility dropped significantly due to the pandemic and geopolitical tensions (Institute of International Education, 2021; European Association for International Education, 2021), prompting a shift toward "internationalization at home" and digital readiness (European Commission, 2021).

2.3. Redefining academia-industry relations in a geopolitical landscape

National security and technological autonomy are redefining these relationships (Etzkowitz, 2008). This creates tension between academic freedom and political imperatives (Vabø & Schmidt, 2025; Rappert, 2007). Universities must balance funding needs with ethical principles, ensuring that local

perspectives do not overshadow a global understanding of diverse cultures. U.S. restrictions on technology transfers illustrate how geopolitical factors directly impact research in cutting-edge AI and semiconductors.

2.4. Expanding the role of higher education in science diplomacy

HEIs must evolve into active diplomatic actors using research to overcome political divides. Focusing on high-impact, impartial fields like renewable energy can reduce tensions (Nilsson Jacobi et al., 2025). The Norwegian Government's strategy for India highlights international research partnerships as a key component of foreign policy (Norwegian Government, 2018).

3. Objections and refutations

The proposed integrated approach faces two common objections.

Objection 1: "Current educational systems are sufficient, only minor adjustments are needed". Critics argue that adding specific courses or updating program content within existing disciplinary structures can address the demands of AI and the ecological transition.

Refutation: This ignores the transformative scale of these challenges. Minor tweaks, such as adding an "AI ethics" module to computer science, fail to address AI's impact on law, journalism, or medicine. Effective integration requires a fundamental pedagogical reconfiguration toward analytical and ethical skills (Ruiz-Muñoz, 2025). Traditional compartments hinder the interdisciplinary collaboration needed for complex problem-solving; future success depends on sense-making and transdisciplinarity beyond rigid boundaries (Davies, 2011). A "minor adjustment" approach produces graduates with fragmented knowledge, ill-prepared for a labor market that increasingly demands "green skills" and "analytical thinking" (World Economic Forum, 2023).

Objection 2: "Geopolitical concerns are the domain of governments, not academia". Some suggest universities should remain "apolitical," trusting governments to manage the geopolitical landscape while they focus on knowledge production and dissemination.

Refutation: This is dangerously short-sighted. A shift towards "New Geopolitics of Higher Education" is observed: national interests and security concerns directly dictate collaboration and mobility (Moscovitz & Sabzalieva, 2023). Remaining reactive leaves universities vulnerable to external pressures, compromising their autonomy. Universities are crucial actors in science diplomacy and global innovation; nationalism and protectionism now threaten the goodwill that once drove academic mobility and campus diversity (de Wit, 2020). Furthermore, national technological autonomy is redefining academia-industry partnerships in strategic sectors (Etzkowitz, 2008). Universities must proactively innovate collaboration models—such as regional hubs and transnational digital platforms—to maintain global engagement and build bridges through shared research.

4. Conclusions

The convergence of the Artificial Intelligence revolution, the Green Transition imperative and the increasing geopolitical fragmentation represent an unprecedented challenge and opportunity for higher education. This paper argues that preparing the next generation to lead in this complex world demands a radical and comprehensive overhaul of current educational paradigms. Our position is that universities must strategically adapt their curricula to integrate advanced digital and sustainability competencies transversally across all disciplines, while simultaneously innovating their approaches to international collaboration, academia-industry relationships and societal involvement to navigate a volatile geopolitical landscape. The core arguments presented highlight the necessity of:

- **Profound curriculum reform:** Moving beyond traditional disciplinary silos to integrate transversal digital competencies, including AI ethics and data literacy, and a deep understanding of sustainability principles (e.g., circular economy, climate literacy) into all fields of study. This fosters the interdisciplinary capacity essential for addressing complex global problems.
- **Strategic navigation of geopolitical dynamics:** Redefining internationalization to cultivate resilient partnerships, explore regionalized alliances and leverage transnational education to counteract restrictions on student and faculty mobility. This proactive approach ensures continued global engagement while protecting academic values.
- **Redefine the relationship academia-industry and societal involvement:** Balancing the need for funding and innovation with the preservation of academic freedom and ethical principles, especially in strategic technological sectors where national security concerns are prominent.

Our rebuttal of common objections underscores the critical nature of these integrated changes. Incremental adjustments to existing systems are insufficient to address the transformative nature of AI and climate change. Furthermore, the idea that universities can remain detached from geopolitical realities is untenable; their global interconnectedness means they are directly affected and, even more importantly, have a crucial role to play in fostering understanding and collaboration among different stakeholders.

The impact of adopting this integrated approach is profound. Universities that embrace these reforms will not only produce graduates with essential skills for the economies of the future but will also develop globally aware and ethically responsible citizens capable of leading in an intrinsically interconnected and complex world. Universities will become resilient hubs of innovation, knowledge creation, and cross-cultural dialogue, actively contributing to sustainable development and mitigating the risks of geopolitical fragmentation.

5. Recommendations and practical implications

To address these challenges, university policymakers should adopt the following:

- **Staff Development & Interdisciplinarity:** Invest in training educators to integrate AI and sustainability across all disciplines and create funding mechanisms that reward collaborative projects across departments and disciplines.
- **Flexible Curricula:** Design modular programs, such as micro-credentials, to adapt to rapid technological and environmental changes.
- **Diverse Internationalization:** Move beyond bilateral agreements to explore multilateral consortia and digital platforms, strengthening resilience against geopolitical crises.
- **Ethical Frameworks:** Establish clear guidelines for technology transfer and research in sensitive areas to protect academic freedom while addressing security concerns.
- **Systems Thinking & AI:** Build pedagogical models for systems thinking to identify root causes of interconnected global problems. Leveraging AI and deep learning can help model this complexity, provided the systems remain interpretable for "humans in the loop."
- **Social Responsibility:** HEIs must engage in lifelong learning to prevent a digital divide, ensuring large segments of the population are not marginalized by AI platforms.
- **Data as a Common Good:** Recognize that while the ICT industry also drives fundamental research nowadays, universities must ensure data serves the common good rather than purely competitive objectives.

Universities are uniquely positioned to promote long-term social betterment. By proactively integrating AI, the Green Transition, and geopolitical awareness, higher education can prepare the next generation to innovate and thrive in an evolving world.

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