

## White Paper for Universities Navigating Artificial Intelligence Innovation Ecosystems in the area of

# AI in Education

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## Executive Summary

The current landscape of Artificial Intelligence in Education (AIED) is a rapidly evolving field marked by a substantial body of research and a diverse array of applications, including adaptive learning systems, personalised tutoring, intelligent assessment tools, predictive analytics, and an expanding suite of AI-driven educational solutions. In this context, the future of Higher Education Institutions (HEIs) must boldly embrace Artificial Intelligence (AI) as an important catalyst for academic innovation. The most recent case of DeepSeek, a disruptive innovation that relies on the initiative of ambitious graduates, exemplifies this trend. Universities must view the transformative impact of AI as an opportunity to advance Higher Education's socio-technological ecosystem internally, rather than relying solely on external expertise.

As AI continues to pervade all sectors of industry and society, it is envisaged that everyone will have an AI assistant in the future that could transform how we make decisions and even how we interact (Whiting, 2024). In higher education, AI powered innovations enhance teaching and learning process by making them more personalised, efficient and data-driven. However, AI's transformative impact extends beyond the academic sphere by creating a complex ecosystem where various stakeholders play interconnected roles in ensuring the effectiveness and relevance of AI integration (Katsamakos et al., 2024).

In this whitepaper AIED is seen as a mechanism for innovating complex socio-technological systems and a tremendous promise to redefine the future of education. By coming together with a shared vision and sense of responsibility, the academic community can lead the way in realizing the transformative potential of AI for the benefit of all.

## Current Status Quo and Importance

The global market for AIED is experiencing substantial growth, with a projected compound annual growth rate (CAGR) of 36% from 2022 to 2030. This indicates a significant adoption of AI tools among students and educators, as the technology continues to redefine how people interact with and learn within educational settings (Mello et al., 2023; Bulathwela et al., 2021; Kamalov & Gurrib, 2023; Ojha et al., 2023). Discussions on AI in education are unfolding on two key fronts: One centres on policy and strategic direction, as outlined in government recommendations, ministry reports, and white papers produced by non-governmental and supranational organisations. The other focuses on academic discourse, which explores AI-driven tools, techniques, and technological advancements that enhance teaching, learning, and educational management. Bridging these two perspectives is essential to ensuring AI's effective and ethical integration within education systems worldwide.

To illustrate this with a thematic analysis, a search in the SCOPUS-indexed database revealed 384 articles focusing on AI in education. These studies can be categorised into seven thematic clusters, predominantly examining AI technologies, their typology, and various types of learning.



al., 2022). As educational institutions increasingly integrate AI-powered tools into their curricula, it has become crucial for teaching staff to understand and stay updated on how students are utilizing these technologies (Li et al., 2024). Integrating AI effectively requires faculty members to be well-versed in the capabilities and limitations of these systems, as well as the ethical considerations surrounding their use.

Moreover, educators should thoughtfully consider how to design courses that incorporate applications of AI in non-technical fields.

## **2. The Role of Students**

AI is also transforming the student experience in higher education by offering personalised learning pathways tailored to individual needs. Students now expect a learning environment that adapts to their unique abilities, learning styles, and aspirations. For AI to meet these expectations, it must go beyond being an educational tool and actively enhance academic efficiency and personal growth. This requires AI systems to uphold pedagogical values that foster critical thinking, creativity, and self-awareness.

Ultimately, students are not passive recipients of AI technologies but active participants shaping the system of education, and the essence of change is linked to the transforming the character of student-tutor interdependencies. While faculty focus on designing and delivering AI-integrated curricula, their work directly shapes the learning experiences of students, who rely on these innovative approaches to build their technical, social, and ethical competencies. The effectiveness of this dynamic, however, hinges on administrative support, which ensures that these initiatives are well-resourced and strategically aligned with institutional goals.

## **3. The Role of Administrative Staff**

According to Chan's (2023) AI Ecological Education Policy Framework, university senior management should be responsible for (1) identifying and preventing academic misconduct and ethical issues, (2) managing AI data security, which includes accountability, transparency, and (3) providing equitable AI access. In addition to these roles, senior management must also take explicit responsibility for embedding AI into the core functions of educational administration, transforming how universities operate across various domains (Khogali & Mekid, 2023). By embedding AI into these critical administrative functions, universities can create a more responsive, efficient, and equitable educational ecosystem. In this context, university administrators play a crucial role in fostering mentorship, industry relevance, and a structured governance model that can adapt to the continuous improvement of AI in education.

### Key Directions from this section

**Faculty:** Facilitation and mentoring in the direction of social constructivism and connectivism with a continuous professional development attitude

**Students:** Developing curiosity in building self-awareness, AI as the tool to boost creativity and extend and multiply moments of self-discoveries

**Administration:** Fostering mentorship, industry relevance, and a structured governance model, equality in the access to AI technologies

**Learning System:** Applying a system view of life mindset; interconnected workplace; creating learning and collaborative societies; leveraging tech tools for community

## Technological Perspectives: Three 'Beyond' Approaches

The integration of AI in higher education presents unprecedented opportunities and challenges for institutions worldwide. This section outlines a comprehensive framework for AI adoption across diverse institutional contexts, addressing the needs of well-resourced universities, resource-constrained institutions, and specialised academic centres.

### 1. Beyond the 'train the staff' attitude: How to finance the technological shift of the universities?

The contemporary higher education sector reveals significant disparities in AI readiness and implementation capabilities. Well-resourced private universities in metropolitan areas often possess sophisticated infrastructure and substantial endowments yet face challenges in effectively deploying these resources for maximum impact.

In contrast, resource-constrained state universities, for example in Asia those situated in smaller cities and towns, operate with limited government funding and basic infrastructure. Despite these limitations, many such institutions demonstrate remarkable innovation in leveraging available resources through creative partnerships and focused implementation strategies.

Specialised institutions present a unique case in AI integration. From one point of view STEM (Science, technology, engineering, and mathematics) focused universities are in a better position, because their faculty members might be more tech-savvy, they have research facilities and infrastructure to advance AI research (García-Martínez et al., 2023). The sustainability of AI integration in higher education fundamentally depends on robust and diverse funding mechanisms. Well-resourced universities have successfully implemented multi-stream funding models that combine traditional sources with innovative financing approaches.

Resource-constrained institutions have demonstrated remarkable creativity in funding their digital transformation. Consortium-based approaches, where multiple institutions pool resources and share infrastructure, have shown promising results. Social sciences universities might focus on securing specialised grants for digital arts and humanities and AI in social research. The key is developing sustainable funding models that align with each institution's capabilities and objectives.

## **2. Beyond the money limitations: How to fund technological implementations?**

As we look to the future, emerging AI technologies promise to further transform university education, though their implementation will continue to reflect institutional resource disparities. Well-resourced institutions can invest in comprehensive AI infrastructure and innovation. For instance, they might establish a dedicated AI research centre equipped with high-performance computing facilities, partner with tech giants like Google or Microsoft for advanced AI tools and offer specialised faculty training programmes (e.g. MIT or Tandon Labs).

In addition, resource-constrained institutions need to focus on cost-effective, high-impact solutions. They might begin by leveraging free or low-cost resources such as Google Colab for basic AI education, utilizing open-source learning management systems, and forming consortiums with other institutions to share resources. STEM-focused universities need to make sure that AI does not stay in research only, meaning, AI solutions are integrated in the learning process, student support services, etc.

Advanced adaptive learning ecosystems will offer increasingly sophisticated personalised learning experiences, with implementations varying based on institutional resources and needs. Well-funded universities might develop proprietary systems that adapt entire curricula in real-time, while resource-constrained institutions could leverage cloud-based platforms.

The evolution of language models and AI tutors will similarly transform teaching support, offering sophisticated, multilingual assistance across various subjects. This could be particularly beneficial for social sciences universities in analysing complex texts and supporting language-based research. Assessment systems will evolve beyond simple plagiarism detection to understand student thinking processes and creativity. This evolution will be particularly relevant for social sciences universities, where evaluation often focuses on critical analysis and original thinking.

The integration of emotional AI and advanced student support systems represents another promising development. Well-funded universities might implement comprehensive systems that monitor and respond to student well-being in real-time, while resource-constrained institutions could utilise basic versions to identify and support struggling students.

## **3. Beyond technical competencies: How to build AI capacities of the universities?**

The evolution of teaching and learning methodologies in the AI era necessitates innovative pedagogical approaches. COIL 2.0 (Collaborative Online International Learning) represents a significant advancement in this area. The integration of new pedagogical approaches with AI

technology requires careful consideration of assessment methods and learning outcomes. Well-resourced universities might develop sophisticated learning analytics systems that track not just academic performance but also skill development and practical application.

Specialised training programmes should be instituted specifically to address the needs of faculty and teaching staff (OECD, 2022). They should be provided technical training (AI tools and platforms), Pedagogical training (teaching methods and assessment), Research integration (AI in academic research) and ethical considerations.

The success of AI integration should be measured relative to each institution's starting point, available resources, and educational objectives. For instance, a resource-constrained university might celebrate achieving basic AI literacy among all faculty and establishing stable internet connectivity across campus. Collaboration between institutions will become increasingly important, particularly in sharing costs, expertise, and best practices. The ultimate goal remains ensuring that technological advancement serves to enhance rather than divide the educational landscape, preparing all students for an AI-driven future regardless of their institution's resources or focus area.

The key to navigating this technological future lies in maintaining flexible, adaptable strategies while ensuring that core educational objectives remain paramount. Well-resourced universities can continue their role as early adopters and innovators, developing proprietary applications and establishing best practices, while resource-constrained institutions can focus on strategic adoption of proven, cost-effective solutions in high-impact areas. This forward-looking perspective should inform current planning and resource allocation decisions, helping universities at all resource levels participate meaningfully in the continuing evolution of AI in education, in a human-centred approach.

## Guiding Principles, Bold Moves, and Key Actions

### Guiding Principles

Following an AI in Education reports review, and a series of workshops held in Shanghai from 21-25 October 2024, we have established the following guiding principles to serve as the framework for our recommendations of bold moves and key actions:

- Cultivate a high-quality, **engaging learning ecosystem**
- Embrace the **knowledge triangle** of research, innovation, and reimagined teaching
- Prioritise a **human-centric vision** and **ethical decision-making**
- Commit to advancing **collective prosperity**
- Ensure accessibility and **inclusive education** for all

With a spirit of humble yet transformative leadership, and after analysing this issue through two essential dimensions: Human and Technological, we will embed the Guiding Principles to provide a framework for discussion and will lead to proposing three bold moves and six actions for

university decision-makers in the following section which act as our contribution to the discussion on AI in Education treated as *no-regret-moves*.

## **Bold Moves**

### **1. Investment in Technologies for Personalisation in Learning**

*Personalised and adaptive learning systems.* The success of AI in education depends on the involvement of the education community and HEIs are best positioned to lead in this role. Several connections can be made between AI and Education, often including what might be called “Learning with AI”, “Learning about AI” and “Preparing for AI” (Council of Europe, 2022).

*AI-augmented instruction and faculty support.* Universities should insist on AI literacy at all levels to support faculty in using AI effectively for teaching and learning. AI can assist faculty in assessments such as formative and summative writing assessments, and essay scoring where AI can be used to grade and provide feedback on learners’ written work automatically (EC, 2022).

*Ethics and responsible AI in education.* The use of AI in education raises ethical concerns beyond bias and privacy, including risks of inequality in access to education and employment rights (EU AI Act, 2024). Additionally, the rise of generative AI tools challenges academic integrity as students, faculty, and researchers may present AI-generated content as their own. While measures like disclosing AI usage are in place, they remain imperfect due to the complexity of authorship in AI outputs. Upholding academic integrity among faculty and researchers is essential to foster a culture of honesty and accountability, setting a strong example for students.

Although AI can enhance human creativity and problem-solving, it should complement rather than replace human capabilities. Universities must adopt a human-centred approach, choosing technologies that align with their needs while recognizing AI's limitations, including bias, errors, and inaccuracies. Human oversight and intervention are crucial to ensuring responsible and effective AI deployment.

### **2. Investment in Infrastructure**

*AI-driven student-career guidance services.* Student support services leveraging AI, like the University of Murcia's chatbot Lola (Vielma, 2024), enhance well-being and academics with 24/7 assistance. Beyond academics, AI-powered career guidance helps students transition to the workforce by offering tailored advice based on their skills, interests, and labor market trends, recommending career paths, internships, or further studies.

*AI for administrative optimisation.* AI can ease administrative burdens in higher education by automating tasks like scheduling, conferencing, and note-taking, with tools from providers like Microsoft, Google, and Amazon. It can aid international student integration through translation and fraud detection in qualifications, ensuring ethical data use. Beyond basic tasks, AI can optimise processes such as admissions, hiring, HR, and finance—streamlining application reviews, personalizing communications, and reducing biases in candidate selection.

*AI-driven data analytics for institutional decision-making.* AI-driven analytics are key for university decision-making in improving student outcomes, efficiency, and resource allocation. Given the complex challenges in enrolment and evolving industry needs faced by universities today, the use of AI-driven analytics can enable universities to make timely and targeted interventions to support stakeholders and ensure that they remain relevant and sustainable.

### **3. Empowerment of Human Resources**

*AI for Skill Development and Lifelong Learning.* As knowledge hubs and know-how centres, universities play a key role in fostering lifelong learning and empowering adult learners/workforce to stay competitive in an AI-driven society. AI can help enhance skill development and lifelong learning through solutions like AI-Powered Mentorship where the AI can facilitate mentorship by matching learners with suitable mentors based on their learning objectives and career aspirations (Ho, 2022). This approach not only benefits traditional students but also mid-career professionals seeking to upskill or reskill in a rapidly evolving job market.

*AI for Innovative Research and Interdisciplinary Collaboration.* AI significantly enhances innovative research and interdisciplinary collaboration within university settings, fostering knowledge creation and research innovation. By integrating AI into research processes and establishing interdisciplinary centres and collaborative networks, universities can facilitate cross-disciplinary partnerships, streamline complex analyses, develop novel methodologies, and create dynamic spaces for knowledge creation and innovation to advance academic and societal progress.

## **Key Actions**

Considering insights from both human and technological perspectives and directions set in the section above, we propose the following actions:

### **1. Creating a University-Backed AI Network**

To harness the power of AI, universities should establish a collaborative network of language models or similar AI systems tailored for academic discourse (Popenici & Kerr, 2017). This AI network would engage with the broader academic community, while establishing substantial competition to commercial solutions like ChatGPT and addressing the unique needs of higher education.

### **2. Redesigning the Ranking Structure**

The current university ranking system often fails to capture the true value and impact of educational institutions, especially in the age of AI. These rankings frequently prioritise traditional metrics like research output and faculty reputation, neglecting crucial aspects such as an institution's AI readiness. A university's capacity to effectively integrate AI into its curriculum, research, and operations is essential for preparing students for an AI-driven future. Furthermore, current ranking systems do not adequately assess the ethical considerations surrounding AI implementation, community engagement with AI technologies, or the development of AI-related competencies among students and faculty. Eliminating traditional ranking agencies and launching

a university-driven "social score" system could provide a more holistic assessment. This new system should incorporate factors like graduate employability, community engagement, quality assurance, competency development, AI integration (including ethical considerations and community engagement), and research contributions, offering a more comprehensive and relevant evaluation of universities in the 21<sup>st</sup> century.

### **3. Enhancing International Mobility and Labor Market Alignment**

By leveraging AI, educators can develop standardised AI Literacy curricula that facilitate international student mobility and recognition, enabling a more globally interconnected learning environment. Additionally, AI-driven counseling and career guidance can support this global connectivity by facilitating a smoother transition of graduates from school to work. Through personalised career recommendations and labor market insights, AI can help students align their skills with global industry demands, ensuring they are well-prepared to thrive in an increasingly interconnected world. This direction requires a change in the perception of academic professionals, now moving towards a "pracademic" approach that blends practitioner and academic perspectives.

### **4. The Need for a New Lexicon: Enhancing Student Wellbeing in the Age of AI**

The integration of AI in education presents both opportunities and challenges for student wellbeing, highlighting the need for a new lexicon to describe the evolving student-machine relationship (Dai et al., 2020). Traditional terms like "love" and "like" are inadequate for capturing the unique dynamic with AI tools. Developing a more nuanced vocabulary, including specific terms to express students' engagement and appreciation for AI assistants, can enhance interactions and contribute to overall student wellbeing.

### **5. Collaboration with Industry**

Collaborating with industry is crucial to ensuring industry-oriented AI research that can address local problems. Integrating industry as part of university operations will help strengthen these partnerships. Additionally, regularly reviewing and assessing the use of AI in HEIs, in collaboration with industry and external partners, is essential. Moreover, existing networks in Asia and Europe, including ASEF, the Asia-Europe Meeting, ASEAN, the EU, and the European Commission, can be instrumental in building and enhancing valuable partnerships. This can enable research on the impact of megatrends, such as technological advancements, on the education sector.

### **6. Establishing Governing Frameworks for Human-AI Collaboration in Education**

Governance models for integrating AI in education should involve partnerships between governmental and non-governmental entities. Since this area impacts the entire higher education sector, existing mechanisms such as accreditation bodies, HEI associations & collaborative communities, especially initiatives like the Positive Impact Rating can be leveraged (PIR, 2024).

## Conclusion and Call to Action

In conclusion, the transformative impact of AI on higher education necessitates a collaborative, multi-stakeholder approach to ensure its effective and ethical integration. Faculty, students, and administration each play vital, interconnected roles in shaping AI-powered teaching, learning, and institutional governance (Tanveer et al., 2020; Chang et al., 2024; Owoc et al., 2021). To achieve the full potential of AI in education, it is crucial that these stakeholders work in tandem, guided by principles of human-centricity, ethical decision-making, and a commitment to inclusive and equitable access.

University leadership must establish robust, collaborative governance frameworks that draw upon existing mechanisms and international partnerships. This will enable the sector to proactively address the challenges and opportunities presented by AI, ultimately creating an educational ecosystem that empowers students, enhances learning outcomes, and fosters innovation.

We view the technology-driven transformation of universities as an innovation trigger and an opportunity to renew the socio-technological ecosystem of education. This involves redesigning curricula and reframing the roles of stakeholders. Rather than a mere transformation of tools, this is a 'build-on' approach that adds value and redefines the interdependencies within education.

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## Background

Established in 2021, the **ASEF Higher Education Innovation Laboratory (ASEFInnoLab)** creates opportunities for higher education stakeholders from Asia and Europe to expand their professional network, exchange knowledge, and collaboratively build their capacity to address common global challenges.

The programme's fifth edition (**ASEFInnoLab5**) focused on Universities' Role in AI Innovation Ecosystems. It was a comprehensive peer-to-peer learning experience implemented virtually from May to June and in-person on 21-25 October of 2024. The ASEFInnoLab5 Onsite Event in Shanghai, China laid the foundation for the development of three high-level white papers focused on AI Governance, AI in Education, and AI for Sustainable Development as well as the design of the upcoming ASEFInnoLab6 Project.

## Implementing Partners



### Asia-Europe Foundation (ASEF)

ASEF is an intergovernmental not-for-profit organisation located in Singapore. Founded in 1997, it is the only institution of the Asia-Europe Meeting (ASEM). ASEF promotes understanding, strengthens relationships and facilitates cooperation among the people, institutions and organisations of Asia and Europe. ASEF enhances dialogue, enables exchanges and encourages collaboration across the thematic areas of culture, education, governance, sustainable development, economy, public health and media. For more information, please visit <https://asef.org/>.



### Fudan University

Fudan University is a major public research university in Shanghai, People's Republic of China. Founded in 1905, today it is widely considered as one of the most prestigious and selective universities in the country. The QS University Rankings 2021 ranked Fudan as the 7th most reputable university in Asia, while it is classified as a Double First Class University by the Ministry of Education in China. Fudan also actively incubates high-tech industries and encourages them to convert knowledge to power. In return, the multi-pattern development of the high-tech industries helps the University to industrialise the research outcomes. For more information, please visit <https://www.fudan.edu.cn/en>.

## Supporting Partner



### Asia-Europe for Artificial Intelligence (AE4AI) Network

The AE4AI Network was established by academics and university managers from Asia and Europe in 2023 with the intent to enhance universities' role in AI innovation ecosystems and together pursue collaboration and actions on AI Governance, AI in Education, and AI for Sustainable Development. For more information, please visit <https://www.asiaeuropa4ai.org/>.

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