



FutureU: Universities in the Digital Age

Future Scenarios and Strategic Responses to
Emerging Challenges

Position Paper



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Editorial Team

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Think Tank “FutureU: Universities in the Digital Age”

Fostering a critical, future-oriented reflection on how universities might change in the digital age is of great importance. The Think Tank “FutureU: Universities in the Digital Age” of the University of Zurich (UZH) aims to initiate and facilitate a critical and forward-looking debate on the **digital future**. Members of UZH should be encouraged to proactively engage with the diverse developments and issues of the digital future. In this process, the focus is on the development of different future scenarios, which are supplemented by strategic responses to emerging **digital challenges**. The results can support the University of Zurich in preparing for and mastering the digital future—the focus, however, is on the joint reflection and learning process.

The Think Tank “FutureU: Universities in the Digital Age” is one of seven action lines that form the Digital Charter—the implementation agenda of the UZH’s digital strategy (www.digital.uzh.ch).

UZH is Switzerland’s largest university and was the first university within Europe that was founded “by the will of the people”. UZH prioritizes bringing benefits to both the public and private sector by sharing knowledge in a variety of ways (e.g., open science, panel discussions, public access to museums).

The Think Tank is one measure of UZH to take on more responsibility and leadership for future developments in digitalization, especially AI, where institutions currently are often portrayed as merely reactive.

Workshop Participants

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Feedback & Reflection

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General note

The views expressed within this position paper are solely those of the editorial team and workshop participants and not necessarily reflect the views or the overall strategy of the University of Zurich.

A New Digital Environment

Trends arising from the Digital Transformation such as datafication, artificial intelligence (AI) and the growing significance of AI agents, digital collaboration platforms, virtual reality, and robot-

scientists will revolutionize existing business models across industries—universities will not be an exception.¹

¹ <https://www.pwc.co.uk/assets/pdf/the-2018-digital-university-staying-relevant-in-the-digital-age.pdf>

Box 1: Why and how to think about the Future

Too often, when we talk about the future, we are in fact addressing the present—constrained by the institutional structures that shape our thinking and actions. This short-sightedness leads us to overlook critical long-term strategies essential for the resilience of our institutions and the well-being of future generations. Because such strategies often involve short-term sacrifices or challenge the status quo, they are easily dismissed. Yet, in a rapidly changing world, merely reacting to change is not enough. To ensure universities remain robust and relevant to society, we must adopt innovative, forward-looking approaches that enable us to actively shape the future rather than merely respond to it.

Universities have long been uniquely positioned in terms of conducting basic (and applied) research to produce knowledge, provide high-quality education, and offer services through knowledge and technology transfer, thereby fostering innovation and contributing to societal development.

In addition, universities have operated in much the same way over decades despite various changes happening around. However, the digital transformation in the age of AI is different due to its unprecedented pace of change², potential to fundamentally disrupt universities' core responsibilities, and impact on their social license and trust.³

While universities are frequently portrayed as reactive to new technologies such as AI, this characterization underestimates their central contributions both in playing a key role in the development of AI and shaping debates about its wider societal implications.

For much of history, access to information was limited, and universities played a privileged role in transforming it into knowledge and legitimizing it.

Today, technological advances and the rise of AI have made information ubiquitous and inexpensive,⁴ thereby challenging universities' traditional role as epistemic authorities and exclusive gatekeepers of knowledge.

Alongside universities, private companies have become central players in research—an acceleration that may now extend to smaller companies as well. However, while such research advances innovation, it is often driven by commercial interests and business models, potentially neglecting research that serves the public good.

In contrast, universities prioritize independent research dedicated to the generation and dissemination of knowledge also in service of society. The University of Zurich (UZH), as the first European university established by a democratic system⁵, continues to uphold this principle. Its core values emphasize research in the service of society. It builds trust through open science practices, including open access and open research data.⁶

In addition, many of today's students, often described as digital natives, expect to be taught in ways that suit them, and current students show a clear sensibility towards employability.⁷ Relatedly, micro-credentialing from various platforms is also gaining popularity.⁸ However, given the accelerated pace of change, the skills we teach today may not remain relevant for the jobs of tomorrow.⁹

Hence, the digital transformation demands new approaches to research, education, and knowledge transfer while simultaneously creating opportunities. Additionally, the rise of AI is accompanied by uncertainty, as it becomes increasingly difficult to distinguish fact from fiction.¹⁰ At the same time, digitalization may mitigate the shortage of skilled workers in many areas, which is at least partly due to demographic change. It currently remains unclear how fewer people in the labor market can

² https://www.deloitte.com/content/dam/insights/articles/2024/us187540_tech-trends-2025/DI_Tech-trends-2025.pdf (page 17)

³ <https://graemeturner.org/2025/02/12/have-our-universities-lost-their-social-licence/>

⁴ The Massive Open Online Course (MOOC) movement is one example of how knowledge become more accessible. For opportunities and threats see also <https://www.erudit.org/en/journals/irrod/2015-v16-n6-irrod105030/1066288ar.pdf>.

⁵ <https://www.uzh.ch/en/explore/portrait/profile.html#:~:text=With%20more%20than%2028'000,by%20a%20democratic%20political%20system>

⁶ <https://www.openscience.uzh.ch/de/open-science-an-uzh/open-science-policies/nationale-strategien.html>

⁷ <https://www.pwc.co.uk/assets/pdf/the-2018-digital-university-staying-relevant-in-the-digital-age.pdf>

⁸ <https://link.springer.com/article/10.1186/s41239-023-00381-x>

⁹ <https://www.bcg.com/publications/2021/impact-of-new-technologies-on-jobs>

¹⁰ <https://digital-strategy.ec.europa.eu/en/policies/virtual-worlds-disinformation>

sustain current levels of or increase GDP (Gross Domestic Product). Given the important role of universities for society, addressing these challenges is crucial.

Thus, to fulfill the mission of serving society and advancing knowledge¹¹, universities must adapt to this new environment¹² by reflecting on and redefining their role and strategies.

These upcoming challenges are the reason why the Think Tank “FutureU: Universities in the Digital Age”¹³ has gathered members of the UZH community, from professional services to professors, researchers and students across all faculties, for a symposium (see Box 2) and a workshop on the guiding questions of:

- What will research and teaching look like in the distant future?
- How should our university prepare to tackle the upcoming challenges?

The goal was to collectively envision a distant future of UZH in 2050 and to develop strategic responses to emerging (digital) challenges using a forward-thinking systematic approach that included an adapted “Yahaba Experiment”—a method from future studies (see Box A1).¹⁴

2 Vision for the Future (2050)

An imaginary vision of universities in the distant future (2050) assumes a complex, uncertain, and fully connected digital world, in which digitalization has transformed every part of our society and economy. Tech giants rule the world through their digital power, and individuals have become part of the global web. The Internet connects everyone and everything.

Box 2: Symposium with Expert Presentations

At the symposium, two experts discussed how universities are evolving in an increasingly digital world:

- **Michael D. Smith**¹⁵ discussed how higher education, traditionally built on scarcity (access, instruction, credentials), is at risk of being disrupted by technology and how the current model of higher education is financially unsustainable and should change to a more equitable and mission-driven model.¹⁶
- **Abraham Bernstein**¹⁷ addressed how technological change, particularly AI, impact education, emphasizing that AI can support, coach, and personalize learning while raising questions about didactically adequate scenarios and the role of universities as social spaces rather than mere knowledge transmitters.

These two expert presentations at the symposium served as a starting point for the workshop in which participants also summarized their key takeaways (see also *Section 5: Areas for Reflection* of this position paper). The recording of the symposium is available here: [Symposium April25](#)

The universities of the future could be *the* only trustworthy institutions, free of hidden agendas and thus a place of intellectual interaction, critical thinking, and an environment where members feel they belong. Knowledge is thoughtfully contextualized, and students acquire unique competencies, learn to reflect critically on knowledge and apply it responsibly.

¹¹ <https://www.swissuniversities.ch/themen/hochschulpolitik/strategie-und-planung#c30153>

¹² <https://link.springer.com/content/pdf/10.1186/s41239-020-00237-8.pdf>

¹³ The UZH Think Tank “FutureU: Universities in the Digital Age” is one of seven “action lines” that form the UZH’s digital charter with the goal to address emerging digital challenges and develop forward-thinking recommendations (<https://www.digital.uzh.ch/>).

¹⁴ See also <https://link.springer.com/article/10.1007/s11625-021-00918-x>

¹⁵ Michael D. Smith is Professor of Information Technology and Public Policy at Carnegie Mellon University and author of the book “The Abundant University”.

¹⁶ Please note that American universities are predominantly financed by tuition fees. However, UZH is mostly financed by the Canton of Zurich as well as third-party funds.

¹⁷ Abraham Bernstein is Professor of Dynamic and Distributed Information Systems, DSI Director and Digital Strategy Board Member at UZH, and author of the DSI Position Paper “AI in Education, Research, and Innovation”: <https://www.dsi.uzh.ch/en/research/projects/strategy-lab/strategy-lab-23.html>

The above scenario is the result of a synthesis of “negotiations” between two groups: one group was encouraged to imagine the future from the perspective of the present (*Present Minds*), while the other group was invited to inhabit the future (*Future Minds*)—shifting their perspective as if the future had already become reality.

During this process, different scenarios of 2050 emerged, the more extreme ones originating from the *Future Minds* (see Box 3 for illustration how and why such extreme scenarios may have emerged), while the more balanced scenarios stemmed from the *Present Minds*.

Box 3: Basic assumptions for 2050

In our “Yahaba Experiment” participants acting as the *Future Minds* first agreed on some basic assumptions for the world in 2050:

- New technologies are ubiquitous, and AI brain-computer interfaces and immersive digital ecosystems have redefined work, interaction, and life.
- People live longer thanks to medical advances; thus, the population will be larger and older.
- Growing inequalities in access to the opportunities offered by technological advances.
- Entertainment and “edutainment” are all around—individuals that have access to technologies that simplify their life will have ample leisure time.
- Natural resources are scarce (climate change).
- Individual freedom is more restricted (surveillance, tracking).

Research 2050

Extreme scenario

From an extreme perspective of 2050, the research landscape is increasingly dominated by research centers founded and controlled by private companies. These centers primarily focus on narrowly defined research questions that align with commercial interests, short-term returns, and business models, potentially disregarding societal needs.

This scenario entails the danger of marginalizing independent, long-term, public-good-oriented basic research, which is vital for preparing society for unexpected futures.¹⁸ It may also lead to a growing disconnect between university research and teaching, potentially weakening the social mission of universities.

Balanced scenario

A more balanced perspective assumes that, given the ubiquity of technology, a direct brain-internet connection enables seamless integration and instant access to knowledge. As a consequence, discipline-driven knowledge production will reach a saturation point, while knowledge ecosystems will gain in importance. In such a world, university research departments would act as hubs connecting people, corporations, and technologies. However, since knowledge is no longer accumulated over time, there is a growing need for “just-in-time” research on various topics (e.g., sustainability, climate change mitigations, geopolitics etc.). As a result, research will be increasingly influenced by dependencies both within and outside the university—particularly shaped by societal needs and financial constraints.

Negotiated scenario

The consensus scenario negotiated between the *Present Minds* and *Future Minds* is based on the premise that by 2050, the ubiquitous presence of technology — such as the connection between the brain and the internet — will greatly improve access to information and knowledge. At the same time, the widespread use of robotics will have a significant impact on labor markets. Moreover, as private tech companies become increasingly dominant, there is also a growing risk that technology will shape research agendas, with priorities determined by business models rather than societal needs. This development may lead to a distortion of research priorities and result in universities playing a less influential role in research than they do today.

This scenario does not render universities obsolete. On the contrary, it suggests a reconfiguration of how they can keep and fulfil their mission in

¹⁸ Basic research conducted in (niche) areas, such as mathematics behind MRI technology, rare disease research, sinology, and Eastern European studies, are essential for today’s societal needs, including medical advances and geopolitical understanding. The importance of the underlying basic research might not have been obvious at the time it was conducted.

generating and preserving knowledge and serving society.

In an interconnected technological ecosystem of the future, the role of universities as trustworthy institutions that value diversity, people, and originality in research will be even more pivotal. Universities support navigation between technology, society, and companies, while preserving spaces for knowledge exchange (including society) and critical reflections to help distinguish truth from falsehood in the age of AI.

Moreover, universities could be the institutions that provide resources for individuals to access modern technology by building data spaces that go beyond the boundaries of disciplines and incorporate private and public resources and aims.

Teaching 2050

Extreme scenario

From an extreme perspective on university teaching in 2050, universities exist as virtual entities rather than physical institutions. They are accessed through immersive spaces via simulation in which futuristic 3D/4D models of people interact.

In part due to unequal access to these technologies, this scenario risks that priorities in teaching will shift away from long-term development of skills and knowledge to short-term enjoyment and economic gain, leaving students less prepared for an uncertain future.

Balanced scenario

A more balanced perspective sees universities as intellectual marketplaces where members of the university reason over values and teach students how to adapt to ever-changing circumstances, remain agile in the face of novelty, and think critically in tandem with technological advancement. An AI assistant is a steady companion, and learning is becoming increasingly self-regulated and personalized. As a result, exams and qualification testing are also becoming personalized and shifting from discipline-specific to work-related competencies. Degrees are highly modularized and based on micro- or even nano-credentialing. Teaching,

learning as well as evaluation happens mostly data driven.

Negotiated scenario

During the negotiation, workshop participants identified a few cornerstones for the future of university teaching:

University teaching may become a combination of immersive and interactive spaces where students always have an AI companion by their side. Professors will still be around and encourage students to reflect critically for the good of society or personal interest. Importantly, lifelong learning and continuous reskilling gain importance, and the student body will change—growing more diverse and increasingly including older generations.

In this scenario the scarcity of credentials continues to be an essential part of university teaching,¹⁹ as universities offer a unique combination of skills, content, and experience that are not accessible to anyone, while also providing members of the university with a sense of belonging in an increasingly connected digital world.

3 Challenges and Strategic Responses

The “Yahaba Experiment” demonstrated that the university of the future will operate in a transformed environment shaped by fundamental changes occurring at an unprecedented rate. In an uncertain, interconnected and digitalized world, universities still have a huge responsibility towards society—acting as a trustworthy institution. However, the way universities fulfil their role may have changed compared to now.

Individuals will learn how to critically engage and collaborate with technologies such as AI. They will need to be adaptable in a rapidly changing environment (e.g. continuous reskilling). By doing so, universities as trustworthy institutions create a place of interaction and give their members a sense of belonging in a world where technology is ubiquitous.

¹⁹ For the scarcity model, see also: Smith, M.D. (2023). *The Abundant University: Remaking Higher Education for a Digital World*. MIT Press.

Based on this, workshop participants developed some (preliminary) strategic responses that may be considered to proactively take action and shape the future of universities (see Box 4).

Box 4: Strategic Responses

- Position the university as a trustworthy institution that takes responsibility in a leadership role and fosters inclusive knowledge development, refinement, and exchange as well as meaningful reflection on societally relevant (long-term) challenges, to prepare society for an uncertain future.
- Strengthen the perceived long-term value of the university through value propositions and cultivating a lifelong, engaged community of students and alumni.
- Enhance cross-faculty collaboration and promote transdisciplinary research and teaching to support critical reflection and knowledge integration.
- Expand equitable access to modern technologies and data from both public and private sources.
- Support cutting-edge research grounded in academic freedom and institutional autonomy.
- Advance digital literacy and social-emotional competencies across the university community.
- Design curricula to be flexible, modular, and inherently interdisciplinary.
- Design, build, and operate both physical and online immersive spaces to engage in interaction, collaboration, and innovation for teaching and research.

members of UZH who had not participated in the workshop critically reflected on the underlying assumptions and the developed scenarios. A critical examination of these scenarios revealed that all actions must consider their impact on the planet, and we must not overlook their interdependencies with the wider external environment. It is important to note that we may be underestimating the pace of change and the scenarios described for 2050 may occur sooner than we think.

Thus, universities such as UZH should take immediate action to strengthen their perception as trustworthy institutions and key players in setting the agenda for emerging digital challenges—challenges that must be addressed early on and in the service of society. Taking on more leadership and responsibility in and for technological development will further strengthen the vision of UZH as a trustworthy institution.

By the end of the workshop, it became evident that both the symposium and the negotiated scenarios for research and teaching in 2050 not only contributed to a shared vision but also highlighted areas for reflection and revealed many unanswered questions that still need to be addressed (Section 5).

However, the challenges ahead also represent a great opportunity to proactively shape the future of universities in a digitally transformed society.

4 The Road Ahead

The presented scenarios and strategic responses certainly include some sort of selection (cf. Box 1) and uncertainty. Importantly, they do not claim to be complete, as not all important factors and digital trends have been taken into account.

With this in mind, a feedback and reflection session was held at the end of the workshop during which

5 Areas of Reflection

1 USP & Relevance	Role of certification, reputation, business model, and mission when technological advancement ease the distribution of high quality lectures at low costs. What will degrees and credentialing look like?
2 Knowledge vs Skills	What is the role of knowledge in the age of AI? Which skills should be taught?
3 Teaching style	The role of instructors, classrooms, and student interactions will change, and more personalized teaching and education may become key.
4 Data ownership, privacy	Who owns the data? What happens to data collected by an AI companion?
5 Opportunities of digitalization in areas with a shortage of skilled workers	In what areas and how can digitalization compensate the shortage of skilled workers due to demographic change?

Declaration of generative AI and AI-assisted technologies

During the preparation of this work the authors used ChatGPT in order to improve readability and language. After using this tool/service, the authors reviewed and edited the content as needed. The cover image was generated using artificial intelligence (ChatGPT).

Box A1: Workshop Methods

Methodological Approach

We applied a systematic participatory approach that combined theoretical input from a symposium, reflection on its key takeaways, and collaborative working groups focused on developing scenarios for 2035. This was followed by an adapted version of the “Yahaba Experiment” to explore scenarios for 2050. The scenarios were subsequently challenged in a *Feedback & Reflection* session.



Adapted “Yahaba Experiment”

In the adapted version of the “Yahaba Experiment”, two groups independently developed and later negotiated with each other a potential scenario for the distant future (i.e., 2050). One group negotiated from the perspective of living in the present and predicting to the future (*Present Minds*), and the other group from the perspective of being (imaginary) citizens of the distant future (*Future Minds*). The experiment was run with separate groups for research and teaching. The “Yahaba Experiment” was only used to develop scenarios and responses for the distant future (i.e., 2050).

While the *Present Minds* did not receive a special briefing, participants allocated to the *Future Minds* got a special briefing on how to represent imaginary people from the future. Apart from special instructions, the perspective shift was supported by a futuristic movie, the distribution of accessories (silver scarfs), and instructions.

As preparation for the experiment, one teaching and one research group developed scenarios and recommendations for the near future (i.e., 2035). This step was used to gradually prepare participants for adopting a futuristic perspective (Figure 1, Box A2, A3)

Feedback & Reflection

The aim was to invite external experts—those who had not participated in the workshop—to critically reflect on and challenge the developed scenarios and strategic responses. To facilitate meaningful dialogue within the large group, the *Feedback & Reflection* session employed the fishbowl method. The inner circle consisted of the invited experts as permanent members, along with three empty chairs that could temporarily be occupied by any workshop participants wishing to contribute to the discussion.

Box A2: Research 2035

In 2035, workshop participants expect increasing availability and potentially access to real-world and real-time data. In this data-driven landscape, private companies are collecting a massive amount of information, and it is likely that more specialized research labs outside traditional university settings emerge. This datafication process supports the shift from databases into interconnected data spaces, offering new opportunities but also raising questions around trustworthiness, reliability, and governance. In this increasing data driven and complex world it may get increasingly difficult to assess the reliability of different research institutions and the knowledge they create.

With respect to how research is conducted, collaboration with AI as co-scientists will increase, while mechanical or repetitive tasks will be delegated, allowing more capacity for critical reflection.

Globally distributed interdisciplinary teams are already collaborating, and this form of cooperation is expected to become even more widespread in the future, potentially challenging the importance of local ties or institutional affiliations.

Box A3: Teaching 2035

By 2035, university teaching will be defined by the coexistence of physical and digital formats («blended learning»). Most likely, scalable content is taught by hybrid livestreams and/or AI professors while the classroom space is designed for physical interaction, critical discussion, and reflection.

Against the background of other digitalization trends, education likely becomes more personalized (AI companion) and global (e.g., livestream lectures from professors from other universities). However, life-long learning becomes more important by 2035 as technological changes are happening rapidly which increases the need for continuous reskilling.

Box A4: Short-term Strategic Responses

Based on the developed scenarios for 2035, short-term strategic responses include:

- Establish modern physical infrastructures to support and accelerate human and social interaction in a digital transformed society.
- Establish structures for interdisciplinary and cross-faculty research and teaching careers.
- Provide financial resources for proper access to digital tools, data, and to build an infrastructure and structures that facilitate (interdisciplinary) cooperation.
- Invest in adaptable infrastructures and start to increasingly rethink the curriculum by offering more flexible, modular, and transdisciplinary packages.
- Foster international collaboration to offer “global classrooms”.
- Train lecturers to teach and assess students’ performance alongside and in collaboration with AI.

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