Universities and Digital Transformation 2030

UNI

Universities and Digital Transformation 2030

Vienna, 2022

Contents

The strategic framework presented in this document was developed within the context of the "Digital Action Plan Austria" (DAA), which pursues the vision of a "responsible digital society". Universities play an important role in this vision because as institutions of teaching, science, research, and innovation, they actively shape the digital transformation for a livable society.

> The term **"digital transformation"** refers to significant changes in everyday life, science, business, and society within the course of digitalisation through the use of digital technologies and techniques and their effects.
>
> In the university context, **digitalisation** is understood as an interdisciplinary issue that affects all areas of the university. As a social phenomenon, it is the subject of interdisciplinary teaching and research between cultural studies, social sciences, law, and the humanities, as well as arts-based research (EEK) and STEM subjects[1]; as a process of transformation, it is changing the university as an institution. It opens up new opportunities for research, teaching, and learning; leads to changed demands in terms of organisation; and enables new ways of interaction between science and other social systems. Therefore, cooperation is required in order to actively help shape the digital transformation.

---

1   STEM: Science, technology, engineering and mathematics

1 Preamble

Universities are actively helping to shape the digitalisation process. People and their needs, as well as the resulting demands in terms of the digitalisation process, are at the centre of these efforts. Universities offer a space for critical examination and reflection on the processes of digital transformation. They also provide and promote the freedom necessary for new, innovative, and unconventional research. By helping students and graduates develop into digitally competent citizens and multipliers, universities make an essential contribution to building a responsible digital society.

Even in the year 2030, education is a public good. "Science and its teaching are free", as are artistic creation, education, and teaching.[2] This, together with people's fundamental rights and rights to privacy, provide the framework for digitalisation.

Among the opportunities that digitalisation makes possible are ways of providing easy access to knowledge and skills, which universities are actively using to reach out to the public. This also enables universities to better take into account people's individual circumstances and needs and to make an impact on society in terms of life-long learning.

Digitalisation is not an end in itself. Through their research and teaching activity, Austrian universities are contributing to the fundamental values of the Digital Action Plan Austria.

---

2   Art. 17 of the Staatsgrundgesetz (Basic Law)

2 A vision of the future – universities in 2030

Universities are designing the digital transformation process in such a way that it provides more opportunities in terms of research, teaching, and organisation.

2.1 Mission statement of the universities

2.1.1 Universities are independent and autonomous institutions

- Universities maintain their (digital) sovereignty in the sense of a capacity to act grounded in autonomy and resilience.
- Universities jointly develop, use, and/or operate digital infrastructures and services to generate synergies between the universities and to increase data sovereignty for critical research areas.
- This also includes creating and retaining the necessary human resources as well as attractive career paths (for technical, administrative, and academic staff).

2.1.2 Universities actively and responsibly shape digitalisation

- Universities take a clear stand on how digitalisation is intended to impact society and how they themselves intend to use the possibilities of digitalisation in their institution. This includes a particular focus on digital equity.[3]
- Universities develop digital innovations or are involved in their development.
- Universities enable students and future graduates to use new technologies in a responsible and critical manner. Students and graduates are not only seen as users of digital technologies; rather they understand how to use them in a creative and imaginative manner, how to further develop them on their own, and how they can actively join in the innovation process.

---

3   National Digital Inclusion Alliance (2019): "Digital Equity is a condition in which all individuals and communities have the information technology capacity needed for full participation in our society, democracy and economy. Digital Equity is necessary for civic and cultural participation, employment, lifelong learning, and access to essential services". https://www. digitalinclusion.org/definitions/ (accessed on 10 November 2021).

2.1.3 Universities are publicly accessible spaces for encounter and exchange

- Universities provide both a physical and virtual space for exchange between students, teachers, researchers, and the public.
- In addition to physical interaction on site, universities now offer the possibility, for instance, of immersion in digital space.
- Universities continue to be an important physical and intellectual reference point for their students, researchers, and staff.
- Universities as physical institutions influence the development of the local area, ensure bustling districts and economic activity, and thus increase the attractiveness of Austria as a place of study and work.
- Universities are freely accessible, both in terms of physical accessibility as well as access to (digital) teaching and research.
- Universities are committed to diversity and gender equality in research, teaching, and organisation. They thus provide a non-discriminatory virtual space and promote the equality of students and staff.

2.1.4 Austrian universities cooperate nationally and are well-connected internationally

- Austrian universities are well integrated into the European higher education and research sector and well connected with international universities, which is reflected in international collaborations and mobility programmes in the areas of science, teaching, and research.
- Austrian universities establish collaborations within Austria in the areas of teaching, research, and organisation.
- Universities cooperate with other areas of education beyond the various education sectors and thus increase the interest in and knowledge of science and research and their methods.
- Austrian universities jointly develop, use, and/or operate (digital) shared services to maintain their sovereignty as far as possible and to strengthen their negotiating position with technology providers and publishers.
- Qualification and training measures are offered on an inter-university basis (example: introduction of GDPR), and new types of jobs are being created at the intersection of academia and administration.
- Austrian universities are involved in European digitalisation initiatives.

2.1.5 Universities are sustainable organisations

- Environmentally friendly and resource-saving IT solutions are standard practice at universities.
- Universities develop and use technologies to increase their energy efficiency.
- Students and graduates contribute to meeting the huge challenges facing society by consciously acting in a sustainable manner on the basis of the knowledge they have obtained and by acting responsibly in a digital context.

2.2 Research

2.2.1 Research is open and publicly accessible

- Austria is committed to open science and to the European Open Science Cloud (EOSC). Universities continue to be actively involved in developing appropriate recommendations and seeing to their implementation. This includes a specific focus on the "Open Science Policy Austria".[4]
- Research results and the methods used to obtain them are also publicly accessible, verifiable, and reproducible in a digital environment.
- Through the use of digital opportunities, citizens gain a better awareness of the research process and scientific methods and can thus deal more competently with knowledge content and research results.
- Digital technologies facilitate the networking process between researchers and the public and accelerate the transfer of knowledge and technology as well as open innovation.
- Open academic publishing is also a matter of course in the digital context.
- Universities have implemented the principles of Plan S.[5]

2.2.2 Research data management is responsible and sustainable

- Inter-university cooperation also includes shared data spaces.
- GDPR guidelines are complied with during the collection of personal research data and researchers and staff as well as students are made aware of the importance of protecting personal data.
- International data standards are met to support the FAIR[6] principles and thus to enable interoperability on the national and international level.
- Data and algorithms are transparent and publicly accessible (open data).
- Metadata are transparent, publicly accessible, and interoperable (FAIR data).
- Public institutions grant universities access to their register data, which can be used for research purposes in accordance with the appropriate guidelines. Public research projects thus obtain privileged access to data.
- Universities adequately take into account the aspects of data sovereignty, solidarity, and security in their research data management.
- Particular attention is paid to the hiring, education and training, and appropriate salary classification of those entrusted with professional assisting, consulting,

---

4   https://www.bmbwf.gv.at/Themen/HS-Uni/Hochschulgovernance/Leitthemen/ Digitalisierung/Open-Science/Open-Science-Policy-Austria.html (accessed on 22 July 2022).
5   Plan S refers to a strategy for promoting open access to research findings that have been obtained through public funds.
6   FAIR stands for "Findable, Accessible, Interoperable, Reusable". The application of these principles in dealing with research data is intended to make them usable beyond individual research projects and institutions.

design, implementation, and communication tasks, such as data stewards and data scientists.

- The use of university research data management promotes innovation and inter- and transdisciplinarity. This in turn strengthens Austria as a business location and facilitates the transfer of knowledge to the economy and society in the sense of the university's third mission.

2.2.3 Ethical and legal reflection on the digital transformation and its consequences is an integral part of the research process

- People are at the centre of technological developments—this is a basic principle of the research and teaching.
- Universities examine and critically reflect on the impacts of new digital technologies on society.
- Research is conducted at universities on "digital humanism" and thus on the philosophical and ethical framework and impact of the digital transformation on people.
- Interdisciplinary research groups from cultural studies, social sciences, law, and the humanities, as well arts-based research (EEK) and the STEM subjects, reflect together on the opportunities, risks, and limits of technical innovations.

2.2.4 Austrian universities are internationally attractive research sites

- Austria is considered to be one of the top sites for research—also in the field of information and communication technology. This can be seen, for instance, by the fact that two Austrian universities are listed among the top 100 in selected internationally renowned rankings.[7]
- International exchange and cooperation between researchers are facilitated by the possibilities of digital technologies (long- and short-term research visits, workshops, conferences, etc.).
- Universities offer innovation labs to provide researchers, students, and citizen scientists with a space in which they can work on developing innovative digital solutions for society.
- Attractive employment relationships enhance the quality of the research site and attract national and international researchers.
- Attractive employment relationships for administrative staff ensure consistent and high-quality support during the research process.

---

7   See Objective 3 of the RTI Strategy 2030: Strategy for Research, Technology and Innovation of the Austrian Federal Government.

2.3 Teaching and learning

2.3.1 The existing range of courses and studies is adapted, and new study programmes are created

- Curricula include a consideration of ethical-social issues, and in particular critical reflection on the possible consequences of the digital transformation. Particularly in the STEM subjects, technology assessment is an integral part of the curricula.
- The teaching of digital skills and data literacy[8] is built into the curricula so that graduates can acquire the skills they need to responsibly use new technologies and possibilities.
- Critical thinking is practised and encouraged through an open culture of discussion—regardless of whether this takes place in person or online—and with due regard for the diversity of perspectives and opinions.
- The topics of data privacy and the responsible use of data are integrated into the students' curricula and students are made aware of the importance of complying with data protection guidelines (for example, in the carrying out of their own research work).
- The recognition of qualifications and degrees and the granting of credits are facilitated throughout Austria by digitally supported processes.

2.3.2 Teaching is conducted at a high didactic standard, and study programmes offer many opportunities for individualisation

- Through the possibilities of digital technologies, students have the greatest possible freedom in terms of access to courses and can choose from a wide range of offerings.
- Students are connected with each other and mutually support one another in the learning process.
- Universities offer a space and the infrastructure for discussions between students and discussions between students and teachers, both in person as well as virtually.
- Teachers try out innovative and creative approaches. Proven teaching methods are disseminated at the university and beyond.
- Courses can—providing that the content allows it—be increasingly offered independent of time and location and still provide ample possibilities for interaction.
- Teachers are assisted in the development and implementation of their (digital) teaching concepts by the universities and the range of continuing education and training courses is expanded.
- Good (digital) teaching receives increased recognition and is properly commended, which is also reflected in the teachers' career paths.

---

8   For further information on the term "data literacy", see https://hochschulforumdigitalisierung. de/sites/ default/files/dateien/data-literacy-charta.pdf (accessed on 16 November 2021)

- Open educational resources (OER) that have been quality assured in terms of content and didactic methods are made available to and used by teachers and students as well as all those interested. Massive open online courses (MOOCs) are offered, where appropriate.
- If personal data is collected with the aid of AI technologies such as learning analytics, the users of these applications always maintain the full ownership rights to their data and decide on their use.

2.3.3 The examination process is supplemented by digital examination formats

- Examinations are carried out in a clear and transparent manner; there is a legal framework in terms of digital examination formats.
- Examinations are intended to assess the student's understanding of the content of the course and the links between the content, as well as the student's acquisition of competences.
- Innovative examination formats can be tried out within the limits of the legal framework (for example, open book examinations).
- Anonymised examination formats help to avoid discriminating against students.
- E-assessment methods offer additional possibilities to make higher education easily accessible and thus more inclusive.
- Data protection and privacy are respected.

2.3.4 Students, teachers, and researchers are internationally mobile

- Through measures for the "internationalisation of the curriculum" according to the holistic approach of HMIS 2030[9] (incl. Internationalisation@home as well as through digitalisation), those students who cannot, for various reasons, be physically mobile are offered adequate opportunities for studying and acquiring skills in an international environment.
- As a useful means of supporting and complementing physical mobility, blended mobility formats make it possible to acquire international and intercultural skills while at the same time minimising the need to travel and thus reducing the environmental impact.
- The course offerings include international cooperation arrangements between universities, which facilitate the exchange of students beyond national borders.

---

9   National Higher Education Mobility and Internationalisation Strategy 2020–2030 (HMIS 2030).

2.4 Organisation

2.4.1 The administration of teaching and research is transparent and efficient

- Measures such as the electronic student identity card, digital support of processes throughout the entire student life cycle[10], and the use of the once-only principle[11] increase the efficiency of administrative processes and improve the user friendliness within the administration.
- The digital application process is now standard, which leads to an entirely paperless university administration.
- Administrative processes within the institutions are simplified due to digitalisation and are freely accessible.
- Interconnectivity among the different university units makes it easier to transfer data.

2.4.2 Tasks and fields of work are defined in a new and more flexible way

- New types of jobs are created in third space[12], such as those of the data steward, the ethics officer, or the legal data protection officer.
- Career paths are seen from a new perspective due to the flexibility and permeability between administration, research, and teaching.
- The (digital) competences of university members are enhanced and continually upgraded through appropriate continuing training.
- Universities offer development spaces within their institutions in order to elaborate and test internal solutions to issues in teaching or administration together with the stakeholders concerned.

---

10   The term "student life cycle" refers to the "[…] search for courses, the application and admission process as well as the enrolment and administration of students and the management of the entire study programme including lectures, examinations and evaluations all the way to graduation" (see https://www.campusonline.tugraz.at/en/product/ student-life-cycle/ accessed on 12 November 2021)

11   "'Once only' refers to the one-time provision and collection of data. In this way, the public administration can—in accordance with the relevant legal provisions and data protection regulation—reuse and exchange the data among each other". For further information, see https://www.digitalaustria.gv.at/initiativen/wirtschaft/projekte-wirtschaft/ projekt-once-only.html (accessed on 30 March 2022).

12   The term "third space" refers to a third professional area at universities between academic and administrative staff that encompasses both administrative tasks as well as academic activities and is increasingly gaining in importance (see Whitchurch, Celia [2008], "Shifting Identities and Blurring Boundaries: The Emergence of Third Space Professionals in UK Higher Education". Higher Education Quarterly, 62 [4] pp. 377–396).

2.5 Infrastructure

2.5.1 In terms of services and infrastructures, the focus is on maintaining a balance between open source and closed source

- For shared/cloud services, suitable, resilient operating models are to be (further) developed, such as those already in operation in the Vienna Science Cluster (VSC) for high performance computing.
- In addition, synergies are to be generated when switching platforms or systems, and their financing is to be secured in such a way that the resulting opportunities can be used for the transformative redesign or new design of processes and practices in the interest of a modern, digitalised administration.

2.5.2 Appropriate attention is paid to data protection and security

- The data infrastructure is state-of-the-art and is constantly updated.
- Data protection guidelines are complied with, and personal data are protected.
- People involved in research, teaching, and administration receive regular continuing training—tailored to their specific field of activity—on the topics of data protection, data use, and data security.
- Members of the university (students, teachers, researchers, and staff) are made aware of the importance of security standards and are continually kept up to date.
- The universities' data infrastructures meet the applicable security standards and are continuously tested and adapted to this effect.

3 Mission and fields of action of BMBWF

As the science ministry, BMBWF is responsible for the strategic governance and development of the entire Austrian higher education sector, by

- establishing appropriate framework conditions for the available governance instruments and for the available governance instruments and legisprudence
- encouraging cooperation and collaborations, coordinating these, and if necessary, creating platforms for the exchange and networking of university stakeholders;
- striving to secure adequate funding for universities.

In the context of the digital transformation of universities, the definition of the above-mentioned roles results in the following fields of action, which have already been implemented in part or are in the process of being implemented.

3.1 The digitalisation of research and teaching are taken into account in the governance instruments of BMBWF.

- As part of the National Austrian University Development Plan (GUEP), the formation of research and teaching clusters is also promoted in the context of the digital transformation.
- In addition, the GUEP also provides for the establishment of research focuses, which combine knowledge from cultural studies, social sciences, law, the humanities, and EEK with STEM subjects.
- Resources are made available for the adequate expansion of the STEM subjects, and particular attention is paid here to these subjects working together specifically with cultural studies, social sciences, law, the humanities, and EEK.
- The universities are encouraged to align the curricula in such a way that digital competences are acquired as early as possible in the study programme and if necessary, that preparatory courses are offered.
- The aspect of digitalisation is given appropriate consideration in the planning and implementation of university construction projects.
- Resources are provided for the acquisition of technical infrastructure needed for digital teaching and for students to receive the digital teaching on the university campus, including the libraries. Wherever possible, open-source software is to be used instead of proprietary software.

- Cooperative solutions in research, teaching, and university organisation are encouraged, which also go beyond national borders to counteract the creation of "isolated solutions".

3.2 Platforms and networking formats for digitalisation are created, and existing platforms and networking formats are expanded.

- Active independent communities of experts—including students—are promoted, which work together to assess the future opportunities and challenges in terms of digitalisation and universities and the role of the university system in cooperative digital transformation processes. Suitable activities to increase potentials as well as their strategic and coherent organisation are supported.
- Networking and exchange formats as well as lecture series are initiated and supported which address both the scientific community as well as the interested public and provide information on the technical as well as social and ethical aspects of the digital transformation.
- The networking of researchers from different disciplines (for example, cultural studies, social sciences, law, the humanities, EEK, and STEM subjects) is encouraged through platforms and event series.
- Collaborations of universities with schools are prioritized to promote fundamental scientific principles, also in rural regions. The aim is to provide digital competences, data literacy, and science literacy, although the focus is primarily on understanding the methods used.

3.3 Clear (legal) framework for teaching and research in the context of the digital transformation is defined.

- Clear and transparent legal guidelines define the context of digital teaching, learning, and e-assessment.
- The application of AI and other innovative technologies as well as their possibilities and limits are discussed in an interdisciplinary way.
- The development of clear regulations regarding data protection, data use, and data sovereignty are prioritized.

3.4 Competitive calls are carried out on a regular basis.

- University-specific calls on digitalisation and research, in which joint solutions are developed in cooperation (for example, digital and social transformation in higher

education), are carried out and suitable infrastructures and processes resulting from the calls are retained.

- The call for the "(Digital) research infrastructure for the sustainable development of universities in the context of digitalisation" project funding as part of the European Recovery and Resilience Facility has been issued.
- Competitive calls are carried out for projects which focus on the topics of ethics and law in the context of digital transformation and network researchers from STEM subjects with cultural studies, social sciences, law, humanities, and EEK.
- Competitive calls are held for projects situated within the context of the realisation of Sustainable Development Goals, taking into account the twin green and digital transitions.[13]
- Competitive calls are held for carrying out citizen science projects related to digital transformation.

3.5 Studies to investigate the impact of the digital transformation on teaching and research are commissioned on a regular basis to then be able to take evidence-based action on the basis of the results.

- Accompanying research on the opportunities and risks of digital teaching is commissioned to counteract evidence-based negative effects. The results are publicly available.
- Replication studies are commissioned to verify (on a random basis) whether the data and algorithms allow for the independent replication of the research results.
- Studies on the expansion of open access and its financial effects are carried out.

3.6 Initiatives in the areas of open science and open education are actively promoted.

- Universities and BMBWF are actively involved in European and international open science processes (particularly in the European Open Science Cloud – EOSC).
- National open science and open access initiatives are increased (for example, Open Science Austria – OSA[14], Verein Forum Neue Medien in der Lehre Austria – fnma[15], Kooperation E-Medien Österreich – KEMÖ[16], etc.).

---

13 European Commission (2022). Communication from the commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on a European strategy for universities. COM (2022). pp. 11–13.
14 https://www.osa-openscienceaustria.at/ (accessed on 22 July 2022)
15 https://www.fnma.at/ (accessed on 22 July 2022)
16 https://www.kemoe.at/ (accessed on 22 July 2022)

- Register data and micro data of the official statistics are also made available to publicly funded research through the Austrian Micro Data Center, and the public can participate through the publication of the key results of the research on the website of AMDC/Statistik Austria.
- The FAIR principles are implemented in all university repositories.
- The OERhub, as is planned in the "Open Education Austria Advanced (OER) – Gesamtpaket für österreichische Hochschulen" project[17], is implemented by integrating all OER repositories of Austrian universities.
- European initiatives for the digitalisation of research and teaching are developed and supported.

3.7 Specific measures are taken to enhance Austria's international attractiveness as a site for research.

- Collaborations on the EU level to develop and implement innovative digital mobility formats as a meaningful complement to physical mobility formats are co-developed and supported.
- Universities and research institutions are encouraged to develop clear mission statements and to raise their respective (research) profile.
- Measures for creating (financially) attractive employment relationships for staff in the area of software development, law, communication, etc. are taken by the universities.
- The framework is created for developing new career opportunities at the universities (for instance, academic-technical staff for the operation of large-scale research infrastructures, data stewards), which increases the quality of the research.
- The acquisition of high-quality and competitive research infrastructures by universities is supported, or already existing research infrastructures of this kind are expanded.

---

17   https://www.openeducation.at/

3.8 Long-term securing of financing for selected core areas.

- In the area of research data management, personnel, organisational, and technical infrastructures for the professional advising and supporting of researchers along the entire research data life cycle are to be developed and established. These must be financially supported in an adequate way.
- Physical and digital teaching and studying rooms are equipped by the acquisition of technical infrastructure as well as planning and implementing university building projects in the context of digital teaching (construction, furnishing, audio and video equipment). Investments are made. Suitably adapted digital teaching settings and resources (incl. open educational resources) are funded for the respective study programme).
- In the area of digital large-scale research infrastructures, such as the HPC[18] infrastructure (Vienna Scientific Cluster), financial support is needed for their acquisition and upgrading as well as extension to other sites (MUSICA project) and for the securing of (long-term) archiving systems.
- The digitalisation of university administrative processes is rigorously pursued, particularly in general administration and teaching. This requires the continuous updating of existing systems, the cooperative development and application of open-source solutions, and the establishment of shared services. The financing for these further developments, investments, and collaborations between universities provides for excellent teaching and research.
- Attractive employment relationships help to counter the shortage of skilled professionals in the area of digitalisation. Universities must be placed financially in a position to attract, recruit, develop, and retain personnel through offers in terms of salary, continuing education, and career.
- Cooperation within and between the universities is clearly necessary to solve the dynamic and multifaceted challenges in the area of digitalisation. The joint development and establishment of (shared) services has high priority and requires financial support through inter-university calls.

---

18   HPC = High Performance Computing.

Notes