What digitalisation means for universities

Edeltraud Hanappi-Egger explains how one of Europe’s leading universities is surfing the rising tide of digitalisation
The process of digitalisation has evolved rapidly. Early on, digitalisation was often limited to converting analogue data to digital media (from vinyl records to CDs, for example). Today, however, the discussion about digital transformation revolves around concepts such as AI (artificial intelligence), the internet of things, cryptocurrencies, big data and cloud services. The new possibilities have led to growing data volumes and higher speeds at which data-based insights are processed and disseminated.

Calls for advancing digitalisation further are gaining momentum and this also concerns universities. In Austria, for example, this development is evidenced by the fact that the Federal Ministry of Education, Science and Research has issued a special call focusing on digitalisation, inviting Austria’s universities to participate and submit digitalisation projects.

Teachers taking on new roles

In our age of digitalisation, many innovative forms of learning, teaching and pedagogical experiences are available to educational institutions. This requires a shift from transmission-oriented teaching towards new forms of coaching and guiding students in their learning processes, based on digital learning environments.

At universities, teachers are not only important role models but also mentors. They need to focus not only on transmitting specific knowledge but also on students’ personal development because studying at university is an important phase in young people’s lives.

Due to the concept of research-led teaching, a university degree programme must familiarise students with current developments, research findings and expertise. This means that we need highly dedicated and qualified faculty with strong pedagogical skills in our lecture halls, or, more appropriately, our “learning” halls.
Building a stronger feedback culture

In many educational institutions, feedback is unidirectional: student learning is graded, often accompanied by a brief evaluation report. At many universities, however, students also evaluate their professors at the end of a term, providing valuable feedback on their teaching performance.

Digitalisation also makes it possible to gather specific feedback on textbooks. When using e-books in class, teachers and publishers can collect automated feedback on passages that are hard to understand: if students need more time for a specific passage, this usually means that they have to re-read the text to be able to understand it. Based on this information, teachers could then review problematic topics in class and publishers could revise difficult passages in textbooks.

Personalised teaching

Digitalisation also opens up new possibilities for personalised teaching. In Austrian primary and secondary schools, students are usually grouped together based on age, with everyone working on the same topics, assignments and materials, regardless of the students’ different skill levels.

Two examples from the US highlight the potential of digitalisation in maths classes. The first example is Carnegie Learning, an adaptive maths learning software.

In conventional classes, all the topics of the school year are covered, without regard to students’ different knowledge levels.

Carnegie Learning, in contrast, selects topics and materials based on students’ prior responses. This makes it possible to identify problematic areas, allowing students to continue practising until they have really mastered the material. Studies show that based on this approach students reach their maths learning targets 12% faster than in conventional classes.

The second example is Teach to One, a maths learning programme that focuses on the personal needs of each student. This system was introduced in New York City schools in 2009 under the name of School of One. Here is how it works:

Students learn maths based on eight different learning modalities, including teacher-
they work. But the two programmes mentioned certainly highlight interesting new avenues.

At first glance, these approaches may seem utopian but a closer look quickly shows that digitalisation harbours great potential for educational institutions. Learning processes are changing and this means that we also need new forms of teaching. Universities have to address these challenges. One of the key questions is which kinds of knowledge and skills can be taught online, which topics require face-to-face work in the classroom and which forms of social interaction are needed. Direct student-student and student-professor interaction helps to strengthen academic discourse – after all, the goal is to critically interrogate concepts and discuss them together.

Welcome to the digital economy

Along with the process of digitalisation, the role of IT has evolved from an auxiliary function into a central element of today’s business activities, leading to increasingly complex problems and challenges.

How will digitalisation change the way we live and work? How will disruptive technologies like blockchains and cryptocurrencies affect our economies and our everyday lives? And, above all, how can we best prepare our students – tomorrow’s business leaders – for the challenges posed by the digital transformation?

Universities in the digital age

Of course, much more research is needed to investigate which methods of personalised and technology-aided learning are effective and how

Algorithms determine the best learning methods to help each individual student learn successfully. For each student, the computer schedules the ideal teaching methods for the next day. Recent evaluations focusing on learning growth show that School of One/Teach to One students acquire maths skills about 23% faster than students in conventional maths classes.
We also need to build faculty capacity and expertise in this field, from digital ecosystems to distributed ledgers and marketing in a digital economy. We are also developing a new bachelor’s specialisation and a new master’s programme focusing on strategy, design and implementation perspectives and the social and legal challenges facing digitalised companies.

The goal is to prepare students for their new responsibilities as future business leaders and to qualify them to thoroughly understand digital companies and apply appropriate management and decision-making models. They should be able to advance innovation based on their knowledge of information technologies and their effects on new and existing business models.

The programme will also aim to prepare students for starting their own businesses in this field. It is important to know which methods, tools and innovations can be used to plan and implement digital value creation. Practical experience gained through co-operation with innovative companies will be another key element of the programme.

**Digitalisation is not everyone else’s business**

The effects of digitalisation concern organisations from all industries, including universities. To advance the digitalisation of universities, we need more than some IT upgrades or new e-learning services. We need university-wide digitalisation strategies that create progressive digital agendas of innovation and change. Such processes entail far-reaching changes and must therefore be proactive in nature.

WU is an innovative university where the majority of all information and data is already provided and processed in digital form. Besides WU’s comprehensive online learning platform and digital course catalogue, students can also sign up for or drop courses and exams online, and prospective students interested in starting a WU programme submit their applications online.

WU researchers publish their work in an electronic repository and document their output in a research database. All WU employees have access to a digital vacation time administration system and an electronic pay slip. WU has one big advantage: its technologically advanced campus that opened in 2013.
WU is therefore well prepared for advancing digitalisation. The next step is transforming existing processes from analogue to digital, and subsequently creating new, innovative procedures based on digital technologies. This requires evaluations and feasibility assessments.

Once the most useful innovations have been selected and prioritised based on the benefits and added value they offer for the intended target groups, the implementation starts. Transparency is crucial and it also important to ensure that the process is supported by all stakeholders in the areas of teaching, research and administration and by the students.

By their nature, universities have access to extensive in-house expertise and know-how. However, universities are well advised to work with external experts and platforms to maintain a continuous exchange of ideas and promote knowledge transfer. In this way, it is possible to generate innovation and master the digital transformation with lasting success.

Our digital strategies should aim to make good use of the opportunities offered by digital technologies without losing sight of the advantages of the analogue world. At the end of the day, the goal is to achieve greater efficiency for all target groups and to create added value.