

2016



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digitalisierung

Hochschulforum Digitalisierung

THE DIGITAL TURN

Pathways for higher education
in the digital age

*Executive
report and key
recommendations*

TABLE OF CONTENTS

PATHWAYS FOR HIGHER EDUCATION IN THE DIGITAL AGE	3	
ABOUT THIS REPORT	4	
HOW THE DIGITAL TURN CHANGES HIGHER EDUCATION INSTITUTIONS	5	
Potentials and challenges of the digital turn	5	
Strategically shaping digitalisation	8	
<hr/>		
MAIN TOPICS	13	
New Business Models, Technologies & Lifelong Learning	14	
Internationalisation & Marketing Strategies	16	
Change Management & Organisational Development	18	
Innovation in Teaching, Learning & Assessment	20	
Curriculum Design & Quality Development	22	
Governance & Policies	23	
<hr/>		
RECOMMENDATIONS	27	
FOR HIGHER EDUCATION INSTITUTIONS	28	
Developing strategies for the digital age	28	
Shaping and implementing digitalisation	30	
FOR POLICY-MAKERS	32	
Promoting the development of teaching in higher education	32	
Expanding infrastructures for digital teaching and learning	33	
Establishing a legal framework for digital teaching	35	
<hr/>		
ENDNOTES	38	
<hr/>		
IMPRINT	40	

**HIGHER EDUCATION
IN THE DIGITAL AGE**

MAIN TOPICS

RECOMMENDATIONS



An overhead view of a meeting table with several people working. The table is dark grey and has various items on it, including laptops, papers, a water bottle, and a smartphone. The people are sitting on black chairs around the table. The floor is made of dark wood. A large, semi-transparent white geometric shape is overlaid on the center of the image, containing the text.

**PATHWAYS FOR
HIGHER EDUCATION
IN THE DIGITAL AGE**



The full, German-only report is available at <http://bit.ly/2fLlfta>



ABOUT THIS REPORT

This summary report presents key statements, findings and recommendations by Hochschulforum Digitalisierung (German Forum for Higher Education in the Digital Age, abbreviated HFD) with regard to shaping forward-looking higher education for the digital age in Germany. This condensed version of the report is geared first and foremost towards readers with limited time and above all to representatives of higher education institution administrations and policymakers who have a key role in the strategic development of the digital turn at German higher education institutions (HEIs). The basis of and background to the analyses and recommendations can be found in the full-length version of the report. It illustrates and documents the findings of a three-year project involving the work of over 70 experts who examined the opportunities and challenges of digitalisation in six expert groups.

Led by Hochschulrektorenkonferenz (German Rectors' Conference, short HRK), Centrum für Hochschulentwicklung (Centre for Higher Education, abbreviated CHE) and Stifterverband and with funding from the Federal Ministry of Education and Research (BMBF), the experts set out their findings in over 25 publications and presented and discussed them at numerous events. HFD is explicitly concerned with the digitalisation of higher education.

Points relating to research and administration were only taken into account where these affected specific change processes in teaching.

The first section of the summary report gives a general overview of changes in higher education and makes specific statements about the strategic design of HEIs in the digital age. The second section explores the thematic fields making up the six expert groups and summarises their findings, which were formulated with a view to addressing central questions. The third section presents general recommendations for HEI administrations and policymakers.

The work of all parties involved that is expressed in the summary report, in the comprehensive final report and in the overall HFD aims to provide orientation in a complex area that is changing and developing at a fast pace. This does not conclude the shaping of the digital turn – rather, this process has only just begun and calls for courageous and flexible action in the face of uncertainty, both now and in the future.

HOW THE DIGITAL TURN CHANGES HIGHER EDUCATION INSTITUTIONS

When the first Massive Open Online Courses (MOOCs) arrived on the international education market in 2012, it was widely touted that there would be fundamental changes in the world of higher education – some people even predicted an end to conventional higher education institutions. However, recent years have shown that the digital turn in higher education has been of a predominantly evolutionary nature to date and that HEIs themselves can be the key driving forces behind this change process. Nonetheless, the digital turn is bringing about lasting changes to higher education, as can be seen in the following section “Potential of and challenges associated with the digital turn”.

In order to make full use of the opportunities presented by digitalisation, it is crucial for higher education institutions to be able to strategically shape the programmes they offer.

From the large number of existing individual projects and experience that has been generated from these, HEIs need to develop didactic, curricular and organisational concepts in which the potential of new technologies is harnessed with a view to further developing HEIs. Digitalisation is not an end in itself – when dealing with these questions at a strategic level, HEIs should therefore be guided by the following general question: how can digital technologies help to solve problems faced by HEIs, teaching staff and students and which new opportunities for further improving higher education teaching? The section on page 8 with the heading “Strategically shaping digitalisation” explains how the digital turn is embedded in the strategic development of higher education institutions.



The full, German-only report “Hochschulbildung im digitalen Zeitalter” is available at <http://bit.ly/2g2JXSh>



POTENTIALS AND CHALLENGES OF THE DIGITAL TURN

Digital teaching and learning is becoming an integral part of higher education. Here, digital teaching and learning scenarios offer a wide range of possibilities for expanding and improving higher education teaching. More active, personalised learning is better suited to the heterogeneous nature of students today and the data-based support of individual learning processes creates scope for academic staff to spend less time merely transferring knowledge and more time helping students to develop their own competences. However, this change process also entails challenges for HEIs, with teaching staff and students assuming new roles in digital teaching and learning processes. The digital turn in higher education requires a legal framework that is conducive to such developments.

COMPETENCES FOR THE DIGITAL AGE

The digital turn in higher education is part of a change process affecting society as a whole. In the workplace, the importance of teamwork – often in international and interdisciplinary contexts – has been observed to be increasing.¹ Flexible working times requiring good self-organisation skills on the part of employees and collaborative activities in which hierarchies are of diminishing relevance – these are already standard features of everyday working life in many organisations. In the future, knowledge work will account for an even larger part of the job market than is the case today. This is because interaction between humans and machines is able to assist, supplement or even replace not only routine work but, to an increasing extent, analytical and intellectual tasks as well. Knowledge-intensive professions that have been far removed from technology

to date – for example journalism or jurisprudence – are now also affected by the digital turn. This means that it is increasingly important for HEI graduates to be able to work independently and under their own responsibility in heterogeneous teams with a view to solving complex problems.² These new requirements expected of young people show that the digital turn in teaching involves more than just media literacy on the one hand and more than just technological innovations on the other.

DIGITAL TEACHING AND LEARNING

Digital teaching and learning scenarios and their objectives reflect this increased orientation towards competences. The wide range of scenarios offered by incorporating digital media in teaching activities can help to intensify learning and, in turn, to improve learning achievements and expand competences.³ New teaching scenarios like the “inverted classroom” model are growing in popularity – here, the knowledge transfer associated with traditional lectures “goes digital” and classroom events are used for intensive, interactive and collaborative work as a group. In this context, integrated learning (or “blended learning”) can transfer the advantages of digital learning and classroom-based learning to new pedagogic and didactic concepts. Self-directed learning and the more individual learning approaches that this allows make a contribution in this regard, as do intensified collaboration with other students (peer-to-peer) and problem-oriented didactic methods. Innovative teaching and learning scenarios focus on the shift from transferring knowledge to developing competences through activating learning and collaborative work, where the focus is on skills such as solving problems, learning independently, transferring knowledge or working as part of a team. This means that digital teaching is not fundamentally superior or inferior to analogue teaching, just different. As with traditional teaching, digital learning methods depend on the design and implementation of pedagogic and didactic concepts and on good teachers and are measured against the learning objectives in question.

PERSONALISED LEARNING

In addition to the increased orientation towards competences, digital teaching and learning scenarios are frequently characterised by the new possibilities that they offer as regards personalised learning. In the simplest scenarios, this occurs when elements of knowledge transfer “go digital”. In such situations, students are offered greater flexibility and can learn at any time, in any place and at their own speed, with ready access to further sources of information. Individual examples also show the potential of these new possibilities: technically sophisticated software can analyse students’ learning behaviour and, based on the analysis of large volumes of learning data, can generate proposals for individual students as regards their next steps in the learning process.

The quality of such technology-aided personalisation depends on its design, on students’ ability to use it confidently and critically, and on extensive data protection provisions. In its most effective form, it allows students – even in larger groups – to learn at their own individual pace and based on their own learning preferences in a way that has only been possible to date in small learning groups and with personal supervision. It also allows academic staff to invest more time and expertise in areas where individual supervision and one-to-one work is necessary.

NEW UNDERSTANDINGS OF ROLES AND PROFESSIONS

In digital, personalised teaching scenarios, the role of teaching staff shifts increasingly from that of an imparter of knowledge to that of a learning supervisor who allows individual learning and educational processes to come to fruition by moderating, controlling and assisting them. Students assume a greater level of responsibility for their own learning process and are actively involved in shaping new forms of teaching. As well as this, the traditional tasks of teaching staff are now shared among several individuals with different competences and functions who shape academic programmes together.

Instructional designers with a background in media didactics shape the pedagogic and didactic aspects of teaching; media designers produce digital learning media such as animations and videos; programmers provide the necessary technical infrastructure; teaching assistants can supervise groups of students and students themselves can play a role in assessing the performance of their fellow students through guided peer reviews. Staffing plans at HEIs are not currently geared towards these new professions for shaping and aiding teaching and learning scenarios.

DEVELOPING ACADEMIC PROGRAMMES

Evidence-based research of digital teaching and learning processes is still needed in Germany, despite some efforts in this direction. The use of digital media now offers greater possibilities for examining learning and educational processes on an ongoing basis and for collecting new data, securing new findings and analysing the effectiveness of learning scenarios. Above all, it is learning analytics – the extensive collection and statistical evaluation of anonymised data regarding teaching and learning – that is leading to new findings regarding teaching and learning processes⁴ that can be used to improve the quality of academic programmes and studies. It is only through this that the extensive personalisation of learning and a more intelligent interlocking of HEI teaching and management are possible in the first place.

By means of complex data analyses, direct indications can be given regarding the learning status of students. Courses can be adapted accordingly – for example, if the majority of students have difficulty with certain learning content or individual students are in danger of not passing the course. Findings about correlations between teaching behaviour and learning behaviour can help to better understand individual study success, thereby raising the success rate for the course in question. At the same time, these findings can serve as feedback for teaching staff, possibly supplementing evaluations which have been largely subjective to date.

However, like its qualitative counterpart, quantitative data analysis has its limits. This should be borne in mind when shaping and further developing research into teaching and learning.

THE CHALLENGE POSED BY DATA PROTECTION

Learning analytics, which uses large volumes of data, offers many opportunities for gaining new insights into teaching and learning and for further developing the quality and didactic aspects of academic programmes. Here, it is a question of adhering to the existing – and, if need be, newly defined – data protection regulations and not only organising personal data consensually and transparently, but also ensuring that the use of learning analytics is based on the principle of voluntary participation and offers concrete added value for students and teaching staff alike. It is also necessary to ensure that such findings are based on anonymised learning data and that the personalisation of learning by means of these data can only take place in pseudonymised form. HEIs often have reservations and insufficient knowledge about the possibilities offered by collecting and using learning data in accordance with existing data protection regulations. These days, a single data protection officer is no longer enough to cope with the scope and complexity of this area. As well as this, no sufficient legal regulations are in place as yet for many cases regarding the collection, analysis and further use of learning data. Accordingly, it is imperative that new standards be developed in order for learning analytics to be used in teaching. Adapting data protection legislation and increasing the build-up of expertise at HEIs are central challenges for putting innovative teaching and learning scenarios into practice.

LEGAL CHALLENGES

As well as the data protection challenges with which teaching staff and HEIs are confronted, there is no legal framework in place as yet for advancing the digital turn in higher education. Current agreements – such as the planned new regulation between copyright collective VG Wort and the Standing Conference of the

Ministers of Education and Cultural Affairs (KMK) for dealing with digital teaching material on HEI-internal learning platforms – show very clearly how the self-evident use of digital media is being hampered. It has to be taken into account that preparing and supervising digital teaching content and academic programmes already involves considerable extra work for teaching staff. To date, the regulations for allowing teaching staff to offset this additional work against their teaching load have been very different in the various federal states (see map). In their individual regulations for teaching responsibilities, the majority of federal states deal with digital teaching – using the regulatory instruments “comparability test”, “burden of proof”, “maximum levels”, “limitation” and “safeguarding the curriculum” – but with a clear undertone of scepticism. The existing regulations for offsetting additional work are not yet advancing the widespread usage of digital teaching at German HEIs.

In the long term, the normality of digital teaching scenarios will also have an impact on

capacity legislation. If the majority of students are studying in digital teaching scenarios, the ratio of resources required to the number of students will change.

TRANSFEDERAL FUNDING MODELS

The digital turn also makes transfederal financing models necessary for teaching in future. On the one hand, thanks to the flexibility of digital teaching and learning activities, students will be able to study to a greater degree in other federal states without necessarily having to be there physically. As well as this, the digital turn in higher education allows and requires HEIs to work together more – this ranges from jointly preparing and using teaching material to jointly offering entire courses of study that cannot be covered by one HEI on its own. In the form of higher education networks, digital courses can be opened up to students of other HEIs that recognise these courses accordingly. These cooperation forms need sustainable financing and promotion options that go beyond federal state borders.

STRATEGICALLY SHAPING DIGITALISATION

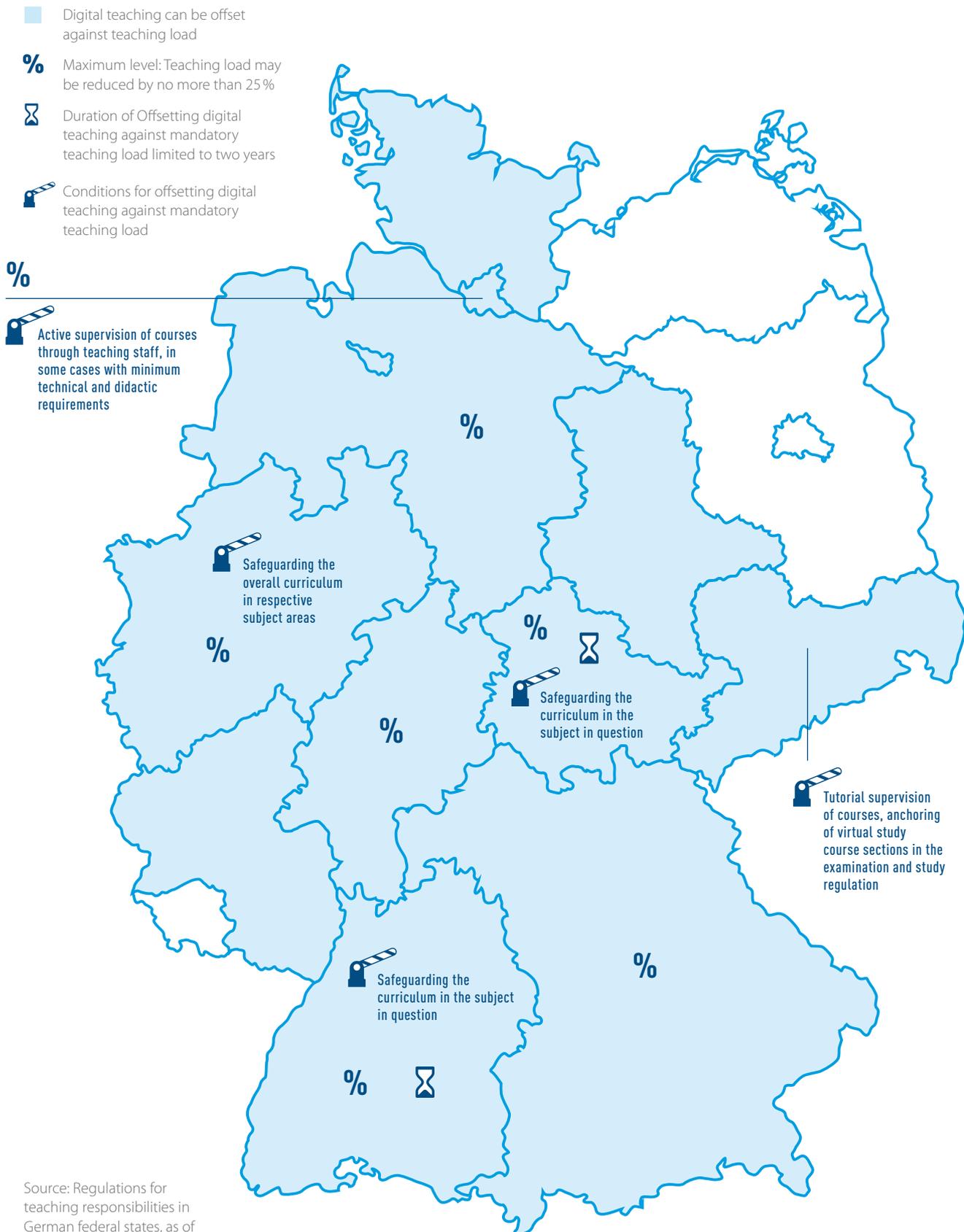
Shaping the digital turn is a key task for HEIs at the highest strategic level. In this regard, digitalisation is integrated in the overall development of HEIs. This means that it should not be seen as an additional challenge for HEIs but rather as a solution for existing problems at a fundamental level. In addition, digitalisation creates new opportunities and scope for raising the profile of HEIs by increasing their visibility within Germany and internationally and by expanding and bolstering their role in society.

MASTERING CURRENT CHALLENGES WITH THE AID OF DIGITALISATION

More and more young people are opting for higher education these days – in 2014, this was the case with almost one in two people per school-leaving year.⁵ The diversity of life models and educational backgrounds also increased in

tandem with the overall student count. “Normal students”, who devote themselves entirely to higher education studies directly after finishing school, are now only a minority among students. The growth in student numbers led to an increase in diversity within the student population. The fact that an average of 28 in 100 students still drop out without obtaining any qualifications shows the magnitude of the challenge faced by German higher education institutions.⁶ New teaching scenarios that integrate digital media as part of their fundamental concept can help to meet these challenges head-on. Rendering the learning process more flexible and personalised will make an important contribution in this regard. Differences in previous knowledge can be offset early on during preparation for studies. Digital competency tests and follow-up preparatory courses can identify gaps in knowledge among

Overview of federal state regulations allowing teaching staff to offset against their teaching load any additional work relating to digital teaching activities – Explicit anchoring of digital teaching in regulations for teaching responsibilities



Source: Regulations for teaching responsibilities in German federal states, as of 23 August 2016. Diagram by author.

prospective students before the course begins and help them to close these gaps. Particularly in these areas, content that has been prepared can be used over several semesters and made available to a large number of students beginning a course. Furthermore, a technology-based personalisation of learning can help HEIs to provide students with individual learning approaches and courses of study – it allows students to learn at different paces, shortcomings to be addressed and special talents to be promoted. When sizable elements of knowledge transfer “go digital”, this also allows students to integrate their work with teaching content more effectively within their everyday schedules and makes it easier for them to undertake different roles and responsibilities in their lives, for example family obligations. And instead of lectures with several hundred students, classroom events in seminar form can be used to prepare exercises together, to solve complex problems or to undertake group work supervised by teaching staff.

STRATEGY PROCESSES AND RAISING PROFILES

The possible ways for using digital teaching scenarios to overcome existing challenges already show the need to use digital media strategically in higher education development. This is because, with over 420 higher education institutions recognised by the state, the German HEI landscape is already very diverse and heterogeneous and each HEI has its own challenges to contend with.

The digital turn further intensifies the differentiation process in the HEI system: the manifold possible ways of using digital media in teaching give rise to new possibilities for HEIs to raise their profiles and position themselves in both the German and the international higher education market. There is no one digital HEI among them: the use of digital media for teaching purposes depends on the existing profile and long-term objectives of the HEI in question. Accordingly, each HEI must find its own strategy for further developing its teaching within the framework of the digital turn and must shape digital teaching and learning

activities, curricula and study structures accordingly and find suitable national and international partners.

STEPPING UP NATIONAL AND INTERNATIONAL VISIBILITY

Digitalisation not only creates new possibilities for strengthening profiles but also offers HEIs new potential for increasing their visibility in Germany and internationally. This also has the effect of intensifying competition on the global education market. Open online courses in particular are already frequently used within the framework of national and international HEI marketing. These offer potential students the opportunity to familiarise themselves with an HEI's range of studies and to forge initial contacts with academic staff. As well as this, HEIs can use online courses to advertise attractive study conditions within Germany or internationally or highlight any unusual core subjects that they might offer. As a strategic marketing instrument, designing the academic courses offered by HEIs ties in closely with the marketing of these, thereby requiring new forms of internal cooperation within HEIs.

TAKING FURTHER EDUCATION SERIOUSLY AS A SOCIETAL FUNCTION

In an ever-changing world, there is a growing need for people to engage in ongoing further education. In 2014, the proportion of the working population taking part in further education measures exceeded 50 percent for the first time.⁷ In this respect, there is a great need for customised modules that can be integrated flexibly in everyday working life, regardless of time or place. Accordingly, further training is – in many cases – already offered today in the form of digital teaching and learning. Apart from this, exceptional situations can be simulated in forms of virtual reality that go beyond traditional role playing and require and train intuitive actions on the part of participants. This means that a growing market with high-quality further education can be served with the aid of digital media. HEIs have the societal function of offering further academic education, both in master programmes and in individual subject-specific modules.

Complete online further education formats even make it possible for HEIs to scale their academic programmes worldwide, thereby tapping into new markets, particularly on international learning platforms. Here, HEIs also have the potential of covering part of the costs for further education through new financing models, even though in practice there are still challenges in this area as regards legal and competition aspects.





MAIN TOPICS



The full, German-only report “New Business Models, Technologies & Lifelong Learning” is available at <http://bit.ly/2gmE7vq>



NEW BUSINESS MODELS, TECHNOLOGIES & LIFELONG LEARNING

The megatrend towards digitalisation also has a lasting influence on the German higher education landscape. At the same time, HEIs are faced with the challenge of catering for an increasingly diverse student population. New technologies are constantly being developed, expanding the possibilities for HEIs and their members. For instance, cloud services, collaboration tools and machine learning offer the potential for marked improvements in higher education teaching and HEI management – while at the same time helping to further develop the services and courses offered by HEIs and to make them available to new target groups. This gives rise to new business and cooperation models for HEIs, start-ups and initiatives. New technologies also create new models in lifelong learning, an area that will be particularly by the digital turn, with much of its potential being tapped by digital means.

BUSINESS MODELS

Traditional business models are changing in the wake of digitalisation. The boundaries between the different supply and demand roles are also shifting in the higher education sector. Prime examples of these are new names in academic training – such as Udacity, which offers Nanodegree programmes, or Epigeum, which makes online courses available to member HEIs to use them for their own students – but also non-commercial initiatives involving many different HEIs. This raises the question about new business and cooperation models in the higher education sector – for both public and private HEIs and also for cooperations with companies. A business or cooperation model is first and foremost the description of how an organisation fulfils its purpose, no matter whether it is for profit or non-profit.

HEIs should examine their business models in depth against the background of the digital turn, focusing on possible cooperation models with other HEIs and beyond.

TECHNOLOGIES

New technologies drive change – for example through new learning environments and new possibilities for measuring learning progress – and therefore make it possible to shape new teaching and learning scenarios in a higher education context. There are various key technologies that speed up this shift at HEIs. These include cloud services, machine learning and learning analytics, augmented reality, virtual reality and digital collaboration tools.

- Fast and robust networks allow IT services to be relocated to the **cloud**. IT resources can then be used dynamically as required. For HEIs, cloud solutions mean above all greater flexibility, faster access to innovative solutions (that they no longer necessarily have to develop themselves) and a marked increase in data security.
- **Machine learning** describes the ability of software to draw its own conclusions from data sets. Apart from the capability of pre-evaluating large data sets from experiments and recommending further series of tests, machine learning will help future students in selecting courses and study material and lead them through learning paths that have been optimised for them personally. The greatest misgivings in connection with machine learning and **learning analytics** concern data protection. Here, HEIs and education policymakers are required to come up with well-balanced solutions.
- **Augmented reality** is a term for the overlay of information and data on the real world. **Virtual reality** describes entirely computer-generated environments. These make contextual learning experiences possible. Augmented and virtual reality can give students a wider understanding of materials and

concepts. Particularly in engineering, science and medicine, these kinds of applications offer major benefits since working in laboratories is cost-intensive and therefore only available for a limited amount of time.

- Optimising personal cooperation by means of **digital collaboration tools** such as Google Drive or Etherpad – but also by using social networks and specific online collaboration environments – makes it possible to digitalise teaching in the long term. Teaching and learning are social processes. Collaboration tools provide effective assistance in typical collaboration scenarios such as the joint editing of documents. These tools create transparency regarding work status and simplify the exchange of information. Unlike many other technologies that are presented, digital collaboration tools are already widely available and ready to use.

New technology is not an end in itself but has the potential to extend the possibilities open to higher education enormously. HEIs should therefore be proactive in the use of new technologies in teaching, research and administration in order to collect its own empirical findings and experiences at an early stage. They should also use available technology to bring about broad improvements in its teaching activities. A culture of experimentation as well as a culture of broad implementation is necessary in order to achieve the desired effects. In the interest of ongoing improvement, these processes should be coordinated with one another.

LIFELONG LEARNING

The importance of life-long learning has increased dramatically in recent years. Further academic education is firmly established as a statutory responsibility at public HEIs: all 16 higher education laws in the various federal states define further academic education as one of the three key functions of HEIs, together

with research and teaching. Nonetheless, further education is taking something of a back seat in German higher education institutions.

To date, however, only a small minority of HEIs have been using the potential of digital teaching and learning methods in their further education programmes. Here, the HEIs are urged to have the courage to invest in new models. Ideally, this would take the form of start-up financing for further education institutions in accordance with regulations for state aid. Business-minded HEIs should be given the ability to invest in the creation of lifelong-learning programmes and institutions if long-term success is to be expected. Here, the state governments should create suitable incentives.

OUTLOOK

The central driving forces for change in higher education institutions are new technologies, new requirements through an increasingly diverse student population and changes through digitalisation in society and on the job market. HEIs should play an active part in shaping these developments. To bring this about, they should have the courage to explore new technologies and to further develop their educational programmes digitally. Existing business and cooperation models should be critically examined and new areas of activity and development identified. In this regard, people are always the main point of focus: in order for HEIs to embrace the digital turn successfully, it is vital for their members to be motivated and to have had solid training. Digital inclusion – i.e. also including people who have little contact with technology – is necessary.

The available technology is continuing to develop rapidly. Even though not every initially promising development fulfils its potential, HEIs should not take this as an excuse to “sit out” changes. Rather, they should seek out close interaction with one another in order to gauge trends and developments and to swap concepts. The work of Hochschulforum Digitalisierung can serve as a model for this.



The full, German-only report “Internationalisation & Marketing Strategies” is available at <http://bit.ly/2g2RxfB>



INTERNATIONALISATION & MARKETING STRATEGIES

The digital turn should always be viewed within the framework of globalisation. In the past 20 years, digital media have helped to globalise business and society, have intensified international cooperation and migration, and further linked the export-oriented German economy internationally in its capacity as a centre of innovation. Digitalisation and internationalisation are mutually dependent. This can also be seen from the HEIs for which the question of internationalisation has increased greatly in strategic importance over the past two decades.

The digital turn promotes the integral internationalisation of HEIs and brings forth new possibilities for further internationalisation. But how exactly will the internationalisation of German HEIs and their global strategic positioning be shaped by digitalisation?

DIGITAL EDUCATIONAL PROGRAMMES ENHANCE INTERNATIONAL MOBILITY

International and intercultural experiences are becoming increasingly important for higher education graduates in a globalised world.

Accordingly, the mobility of students worldwide has been rising rapidly for years as well. At the same time, however, the German student population is becoming more and more diverse as HEIs open up. In view of the rising student numbers at German HEIs and the heterogeneity of students’ life conditions and models that this entails, the declared goal of the federal government remains an ambitious one: for every second higher education graduate in Germany to have had study-related overseas experience by 2020.

The use of digital media can contribute to a situation where more students opt to spend time abroad, where this can be integrated more easily into their studies and where the students themselves can be integrated even more effectively in their host countries. Digital courses give students a more extensive impression of the courses available at the foreign HEI;

through social media and modern communication technology in general, students can make contact with other students and academic staff in the host country even before the course begins.

Furthermore, digital media and online teaching, learning and assessment scenarios can be used to render courses more flexible and to increase mobility. This way, periods spent studying abroad can be integrated more effectively in courses at the home institution. Digital assessments and online courses allow students to take or complete courses in Germany even when they are not in the country.

VIRTUAL MOBILITY INTERNATIONALISES CURRICULA

In addition, it is becoming increasingly important to create ways to garner intercultural learning experiences and to gain an international perspective in courses of study in Germany, since only a limited proportion of students have the opportunity to actually study abroad. Under the heading of “internationalisation at home”, HEIs endeavour to create an environment that offers students and teaching staff possibilities for international networking and collaborative learning in international groups, including when studying for a degree in Germany.

Digital media are now expanding these possibilities for internationalisation at home in Germany by creating forms of virtual mobility with a structural approach that can be used to integrate international learning experiences in the entire curriculum at German higher education institutions. This establishes centres for international interaction where intercultural experience can be garnered even by those students who do not spend time studying abroad.

The forms of international, digital teaching cooperations range from integrating digital guest lectures in academic programmes all the way to jointly designing entire courses of study in blended learning formats or virtual space.

Academic staff from different countries can also teach together and prepare digital teaching materials or even entire modules together. In this way, digitalisation also advances the entire field of international HEI cooperations at institutional level and allows academic staff and student teams in different countries to undertake virtual collaborations. However, physical and virtual mobility should be seen as complementary rather than opposing phenomena.

RAISING INTERNATIONAL PROFILE AND INCREASING INTERNATIONAL VISIBILITY WITH DIGITAL MARKETING

The nature of international marketing by higher education institutions is also greatly affected by the digital turn. Firstly, the digital age is bringing HEIs around the world closer together: competition for the best minds is intensifying, while educational programmes and study conditions are becoming more comparable.

Secondly, the advent of digital media brings forth new marketing instruments as well: such diverse elements as interactive communication formats, social media and search engine optimisation are standard features in today's international marketing repertoire. Used as part of an all-embracing strategic approach, digital media offer new possibilities for strategic profiling and increasing international visibility. Apart from this, digital media can be used to improve the process for recruiting international students and inducing the best students to study in Germany. Online education can also be used as an international marketing instrument

through which potential students from all over the world are given direct insight into the HEI's academic programme.

STRATEGICALLY COMBINING INTERNATIONALISATION AND DIGITALISATION

While most HEIs have developed their own internationalisation strategy at this stage, in most cases they have yet to strategically combine internationalisation and the digital turn. Here, the use of digital media can make a fundamental contribution to achieving the HEI's internationalisation goals and the goals set by the federal government.

This is because digital educational programmes can further encourage and improve the internationalisation of HEIs and their academic programmes. One advantage for HEIs is that Germany is one of the most popular countries in the world for studying in. If this is to remain the case, HEIs need to continue preparing students for the globalised job market by means of excellent academic programmes – and to attract not only many but the right international students and academics. To achieve this, HEIs need to combine their strategic internationalisation measures with their digitalisation activities when marketing their institutes and defining their academic programmes. When open online courses offered by individual academic staff members also serve as marketing for the HEI, it is clear that there is a need to align the areas of teaching, internationalisation, digitalisation and HEI marketing more closely with one another.



The full, German-only report
“Change Management &
Organisational Development”
is available at
<http://bit.ly/2fLoev0>



CHANGE MANAGEMENT & ORGANISATIONAL DEVELOPMENT

Digitalisation activities currently undertaken by HEIs are mostly limited to establishing fundamental infrastructure and offering IT-based and media-based training for teaching staff and students. This also includes ad hoc projects undertaken by individual academics, which in many cases are only integrated in complete study programmes to a limited extent. The transition from digitalised teaching in individual projects to introducing digital media into complete study programmes calls for a very careful and systematic approach to strategy and change processes in the HEIs. At the various institutional levels of HEIs, it is partly necessary to establish new organisational units and to initiate intensive cooperative measures between central management and academic courses, specialist areas or faculties – in some cases outside the HEI itself – and to help bring about changes in the cultural practices of teaching staff and students. The aim here is to take the institutional attributes of the German HEI system into account, which is characterised by the combination of a management- and self-management model.

THE DIGITISATION OF ACADEMIC PROGRAMMES AFFECTS MANY PEOPLE AND IS AN ONGOING PROCESS

For some years now, new high-quality possibilities for shaping teaching and learning arrangements are emerging through the use of digital media – for example e-portfolios, inverted classrooms, online peer collaborations and other collaborative learning forms. When it comes to digitalised teaching and studies, the complexity of the changes needed at the HEIs with respect to content, IT and organisation is high.

A decisive factor for the use of digital media to improve the quality of academic programmes and curricula is mutual support among players in the programmes at the following levels, i.e. among HEI administration, deanships, study directors, academic staff and students. Merely through regularly stabilised cooperative measures between these groups at the various action levels, digital media can be

used to bring about ongoing improvements in teaching quality throughout the spectrum of academic courses offered by each HEI. To this end, academic staff and students in the study programmes on site must be encouraged and provided with good advice and training with regard to IT and media didactics. Under these conditions, the status groups will change their attitude to digital media and their cultural practices in dealing with them.

Only a small number of academics at German HEIs fundamentally reject the use of digital media; rather, most wish to be convinced by the meaningfulness of digital media. In this connection, it is deemed expedient to view the digitalisation of academic programmes in connection with improving “standard” teaching at HEIs. For this to take effect, the value added by digital teaching – i.e. the contribution that digital media makes to improve the quality of academic programmes – must be visible, not only for teaching staff but also for students.

A COMMON UNDERSTANDING OF TARGETS AND PROFILING STRATEGIES

It is possible to enhance academic programmes on an ad hoc basis using digital media through the efforts of individual members of academic staff. For this to be applied across the board, however, it is necessary for many players to change the way they think. In many cases, HEI administrations view the digitalisation of academic programmes as useful and purposeful but not really as an urgent priority for their institutions. Pioneers among professors using innovative digital formats can be singled out as examples of successful efforts to introduce digital media. However, ad hoc application of digital learning formats in academic programmes alone will not make any great contribution to improving the quality of these throughout HEIs as a whole. For this step, it makes sense for HEI administrations not to regard digitalisation as an additional challenge but rather as an opportunity to edit existing missions, goals and strategies more effectively.

A number of HEIs are already using the digitalisation of academic programmes to raise their profile and to position themselves on the German and international market. This is customary in communications with students and alumni; however, when it comes to improving the quality of academic programmes, to opening up HEIs to new target groups, and to marketing and internationalisation, very few convincing examples have been found among German HEIs to date.

The perception of these strategically relevant options with the aim to improve one's own position in the German HEI and knowledge system is not a usual step for modernising working resources and tools – a step for which rough development plans and further education and consulting are sufficient. To this end, it is necessary to recognise the new, high-quality opportunities that exist for fundamentally reshaping academic programmes and to derive strategic conclusions from these. A cultural shift in teaching practices among academic staff has not yet proved to be a driving force for digitalisation initiatives in German higher education institutions.

But the sustainable integration of digital media in academic programmes should make such a shift in the focal point of strategic considerations on the part of HEIs. This fundamental transformation at the level of academic programme core processes is not realistic without suitable prioritisation by those involved, both on a centralised and decentralised basis.

HEI-SPECIFIC SOLUTIONS AND STRATEGIES FOR THE DIGITAL AGE CALL FOR NEW UNDERLYING CONDITIONS

In the case of digitalisation, too, innovations frequently occur outside everyday working processes and contexts.

The problem is, however, that there is a long way to go before these can be integrated in a way that is relevant for everyday life. Because of this, there is a risk that flagship projects bring about quick wins but are of scant relevance to normality. In extreme cases, these flagship projects can even curb the diffusion of innovations, as the players in question are content with rapid but unsustainable results. Accordingly, digitalisation initiatives should not be too far removed from everyday teaching from an institutional perspective. In this respect, it is advisable to view digital teaching in connection with improving standard teaching.

The strong external promotion of digitalisation has done little to help solve this problem to date. Efforts in the selected pilot projects aimed at meeting innovative goals – which have mostly been set externally rather than linking the use of digital media with the objectives of study programmes, specialist areas or HEIs – have unintentionally hampered efforts to establish digital media sustainability in academic programmes at many German HEIs. A significant conflict area between the promotion of innovative pilot projects and the development of low-threshold offers for widespread use among academic staff is likely to occur, as it was the case about ten years ago.

In the current phase of digitalising academic programmes, the use of digital teaching and learning formats should only be promoted as an integral part of complex study programmes. This suggestion involves abandoning the exclusive promotion of special digitalisation projects in favour of supporting complete study programmes relating to specialist areas or faculties. In line with the shift from teaching to learning, innovativeness should not be measured based on how new digital projects are but rather on the extent to which higher teaching and learning targets are reached.



The full, German-only report “Innovations in Teaching, Learning and Assessment” is available at <http://bit.ly/2g2Rq11>



INNOVATION IN TEACHING, LEARNING & ASSESSMENT

In a higher education context, digital learning formats are only rolled out on selective basis, with many HEIs merely using digital elements to supplement traditional teaching. At present, integrative digital formats requiring both a changed classroom phase and digital elements are not being used across the board. The widespread private use of digital media among students is not necessarily transferred to their study activities. As a rule, students use formats that are provided by their own teaching staff and rarely use freely available digital formats. Digital media are already prevalent today only in cases where they constitute a mandatory part of the learning process. Positive implementation examples demonstrate the potential of integrative and innovative digital formats. For example, scenarios such as “inverted classroom” can establish a better mentoring situation for students and, by the same token, game-based approaches can also activate and motivate them. However, such examples can generally be attributed to the individual motivation of certain members of the academic staff. Only at isolated HEIs digitalisation is recognised as a strategic area of activity at HEI administration level and treated as a priority.

ON TRACK FOR DIGITAL STUDYING

It is essential for all stakeholders (HEI administration, academic staff and students) to be aware of the added value associated with integrative digital formats and to use these together situationally in the relevant learning context. So that digital formats are not only implemented by motivated “lone fighters” detached from the overriding objectives of the HEI, but rather that they become permanent fixtures of everyday student life. Here the focus should not be on the technology itself but rather on the question: what challenges and problems can be solved by using digital learning formats?

As well as enhancing face-to-face teaching and integrative digital formats, complete online

study programmes and online courses are being offered at higher education institutions. Compared with integrative digital formats, the complete course is then offered almost exclusively online, the classroom teaching stage is taking place to only a limited extent or not at all. Unlike integrative formats where added value is found in particular in the changed face-to-face teaching phase, online courses are geared primarily to a specific target group – for example people studying parallel to a full-time job after work or users of adult education and further education – who benefit above all from the fact that they can participate in online courses whenever and wherever they wish.

DIGITAL LEARNING AND ASSESSMENT SCENARIOS ARE NOT AN END IN THEMSELVES

Digital learning and assessment scenarios offer the potential to further develop traditional formats through a wide range of new didactic, social, technical and organisational possibilities. These include in particular:

- a) Increasing motivation and potentially more sustainable learning effects among students, for example through direct feedback, multimedia presentation forms or game-based formats
- b) Adapting learning content to the needs and abilities of students
- c) Collaboration between students regardless of location

In order for this potential to be used and specific digital learning formats to be implemented, the necessary underlying conditions must be created and resources provided (personnel, infrastructure, services, time). Policymakers and HEIs therefore need to adopt suitable measures promoting and facilitating the everyday use of digital learning formats in studies and to remove obstacles that have previously stood in the way of this.

INCENTIVE POLICY

Federal and federal state policies, for instance, can create incentives by making resources available for developing and implementing innovative strategies and scenarios, e.g. through competitive tenders or teaching awards. In addition, resources could be made available, for example, in an innovation fund for digital teaching, which could be used primarily to advance innovations in teaching with low financing requirements and provide swift, uncomplicated assistance to innovative projects. Academic staff requires technical and didactic assistance when implementing digital teaching. The federal states should ensure that the appropriate key support structures are universally available at federal state or HEI level and that academic staff are aware of these. Policymakers must bring the current legal framework in line with the digital age, retaining a focus on various interests, thus maximising the potential of digitalisation while minimising existing risks at the same time.

OPPORTUNITIES FOR HEI ADMINISTRATION AND ACADEMIC STAFF TO PROVIDE INPUT

Responsibility for a successful integration of digital media in academic programmes lies to a great extent with HEI administrations; they can assist or advance this process through various measures or even slow it down. Their function also includes initiating and assisting the digital turn and including all involved parties in working out suitable concepts and measures for implementing jointly defined objectives. As well as this, HEI administrations should push forward and assist the implementation of digital learning scenarios at an organisational and financial level through practical measures and suitable underlying conditions.

Academic staff must know the spectrum of digital formats available to them and be able to gauge the impact of these on their own teaching activities. To harness the potential of digital media, they should not only enhance their teaching activities with digital elements and scenarios but should also use integrative blending learning formats in which digital elements can be combined with face-to-face teaching in a wide range of variants.



The full, German-only report
“Curriculum Design & Quality”
is available at
<http://bit.ly/2eMR1T4>



CURRICULUM DESIGN & QUALITY DEVELOPMENT

Digitalisation offers enormous potential with regard to education policy objectives, namely opening up higher education institutions, integration and inclusion, practice orientation, promoting central competences in an increasingly digital society and improving the feasibility of academic courses and supervision of students. In this connection, three areas are of particular significance: “Designing digital teaching, learning and assessment activities”, “Recognition, crediting and certifying” and “Opening up higher education institutions and increasing their practice orientation”.

DESIGNING DIGITAL TEACHING, LEARNING AND ASSESSMENT ACTIVITIES

Digital and analogue elements within curricula belong together and must not be played off against one another. Both digital and non-digital learning formats need to be prepared didactically as well as included in curricula. For teaching in higher education institutions, design principles apply regardless of the type of teaching and learning media used. The potential of digital learning formats and tools should be used thoroughly when developing curricula. Technical incompatibilities, closed systems and isolated solutions should be avoided whenever possible in favour of a uniform structure that is appropriate for the learning objectives. When designing new curricula, it should be ensured that new technical solutions can be integrated in ongoing study programmes at any time.

A sufficient degree of digital literacy is required in order for the flood of digitally available information to be used for the sustainable development of competences. Accordingly, HEIs should aim to develop the skills of their students in the field of digital learning. In addition, students must be qualified of critically examining the IT and media sources that they use. With regard to the academic programme’s orientation towards competences, digital media also offer another instrument that should be used specifically: E-learning and blended

learning is particularly attractive for potential students who cannot or do not wish to enrol in a full-time course of studies.

The sustainable use of digital media to assist learning achievements calls for suitable underlying conditions to be in place in a technical (usability, administrability) and legal context (teaching load regulations). Digital teaching elements must also be included in curricula and be fully credited. It is not possible to digitalise academic courses without making adequate institutional, personnel and financial resources available.

RECOGNITION, CREDITING AND CERTIFICATION

Already today, people enrol at higher education institutions with prior knowledge that they have acquired in various ways. This phenomenon is further accelerated by digitalisation. This means that HEIs need to develop possible ways to take into account prior knowledge and qualifications more effectively, including those from non-HEI institutions. Criteria must be developed – particularly by HEIs – in order to be able to verify the level of this knowledge by higher education standards and to classify them in terms of the curriculum. Standards for documenting these learning formats in all higher education institutions must be defined in order for skills acquired through non-HEI educational formats to be accredited adequately.

A central function of HEIs in addition to research and academia is issuing certificates and other credentials. This function will grow in importance as the number of non-HEI educational programmes continues to increase. In order to assess and safeguard quality, this requires standards and procedures that must be developed by the HEIs.

OPENING UP HIGHER EDUCATION INSTITUTIONS AND INCREASING THEIR PRACTICAL ORIENTATION

The dialogue between HEIs and society and the participation of citizens, social partners, professional practice and various social players

can be strengthened with the aid of digital media. In addition, digital media offer great potential for education policy objectives, i.e. opening up HEIs, inclusion and integration. By means of digital media and learning formats, new and innovative teaching and learning scenarios can be developed which zone in more flexibly on the needs of a heterogeneous student population and facilitate individualised learning. In this way, they can make a significant contribution to new and practice-oriented study formats, to greater diversity in academic courses, to opening up HEIs to non-traditional students and to improving the underlying conditions for lifelong learning.

PERSPECTIVES

The use of digital teaching formats offers enormous potential for opening up higher education institutions, for gearing students

towards competences and for improving the quality of teaching. In order for this to succeed, policymakers are urged to make suitable and sufficient long-term financing available in order to ensure the basic structure necessary for this. HEIs are urged to strengthen flexible, media-aided teaching and learning formats (bachelors degrees, masters degrees and continued academic education) and to integrate these in their curricula.

Additionally, the curricula for all disciplines should be examined to determine whether necessary (digital) competence is imparted –to ensure that students have sufficient information and media skills that go beyond basic usage.

GOVERNANCE & POLICIES

In the area of digitalisation, governance cannot function prescriptively but rather means for policymakers and HEI administrations to shape underlying conditions, anticipate new developments, play an active role in defining targets at various levels, create incentive structures and promote openness for various forms of teaching and learning. Such an approach does not require explicit specifications and abstains from rationales that employ the term “unavoidable”.

On the other hand, neither students nor teaching staff have articulated a great desire to be involved in effecting and shaping this change, neither in public nor communicated explicitly to HEI administration. However, the status quo is not fuelled by a general disinterest in these developments, but rather by the lack of functional models. This gives rise to organisational, financial and legal questions.

ORGANISATION

Although the vast majority of German HEIs are currently characterised by face-to-face teaching, they frequently engage in processes for

supplementing and further developing teaching by means of digital elements. Only a small number of HEIs do not show any commitment to digital teaching at all. What is needed for sustainable implementation, however, are signals from HEI administrations and from the responsible governments. Ideally, this would involve increased engagement of HEIs and policymakers in the area of blended learning in order to interleave face-to-face teaching and phases of online learning and for policymakers to make adequate resources available on a long-term basis.

The importance of HEI libraries as central places of learning is increased through the digitalisation of studies: learning together – either in groups or in adjacent individual workstations – stimulates the learning process. Specifically, this means that modern HEI libraries should not only provide digitally networked individual workstations but also many soundproof group rooms in which digital media are available.



*The full, German-only report
“Governance & Policies”
is available at
<http://bit.ly/2g4sVM>*



FINANCING

Digital teaching costs money, but offers additional value: it enhances the quality of teaching and helps to reach new target groups for whom traditional face-to-face teaching is not an option. Sustainable resources are an essential requirement for digitalisation at HEIs – after all, it is not possible to design, produce and implement digital teaching without additional costs and personnel expenditure. Sustainable financial planning is essential: before new digital academic courses are introduced, the financing of ongoing costs must also be taken into account. Sustainable digital teaching and learning activities also need permanent positions for teaching personnel given that a similar student-teacher ratio is required as for face-to-face teaching. Extensive scaling, i.e. opening courses up to a wider group of people without increasing teaching personnel, is not possible in digital teaching.

LEGAL QUESTIONS

Legal questions arise in the area of copyright and data protection law: HEIs should enter into standardised contracts with academic staff in order to secure usage rights for digital teaching formats. Including copyrighted third-party material is subject to the restrictions set out under paragraph 52a of the German Copyright Act (UrhG). Teaching staff and HEIs require legal certainty with regard to copyrights and usage rights. This area is of central importance, particularly when it comes to digitally aided teaching. Accordingly, policymakers are urged to create a more academically friendly copyright legislation. HEIs should set up advice points for academic staff with regard to copyrights and usage rights as well as producing and updating handouts. Current data protection legislation requires a qualified declaration of consent for the evaluation of data generated within

the framework of digital teaching formats. Additionally, there are questions pertaining to constitutional law, administrative law, assessment law and competition law. For example, making digital teaching mandatory for academic staff would violate the right to freedom of teaching provided for under article 5(3) of the German constitution – this means that HEIs are advised to devote new positions to digital teaching and to define them accordingly when advertising them. Open teaching formats in which students can take part outside the HEI in question can, under certain circumstances, give rise to challenges under capacity law. In the case of assessments that do not take the form of (homework) assignments, the only legally secure option available at present is still to verify participants' identity on location.⁸

PERSPECTIVES

As a crosscutting issue, digitalisation calls for a strategic examination within HEI administrations. The currently prevailing concept of enhancing teaching with digital elements on an ad hoc basis should be developed into an approach that interleaves face-to-face teaching and phases of online learning.

It is above all the continuing digitalisation of teaching that is making it more and more important to provide digitally equipped learning spaces in HEI libraries. Policymakers and HEI administrations are urged to continue developing libraries into state-of-the-art learning spaces.

Financing digital teaching entails major challenges for HEIs because of limited resources. Accordingly, policymakers are urged to finance technical infrastructures and materials as well as personnel who are well versed in technology and media didactics; this financing should be sustainable and not tied to projects.





RECOMMENDATIONS

FOR HIGHER EDUCATION INSTITUTIONS

DEVELOPING STRATEGIES FOR THE DIGITAL AGE

INITIATING STRATEGY AND CHANGE PROCESSES

To date, digital teaching and learning innovations frequently occur outside everyday working processes and contexts in pilot projects. In order to harness the potential of digital education, change processes need to be initiated at HEI level and be geared towards the further development of teaching as a whole. Without central decisions regarding infrastructure, organisational culture and HR training and development, it will be very difficult to integrate digital teaching to the extent necessary to be of relevance for everyday student life. The adaptation processes necessary for this will last many years and can only be decided upon and implemented in intensive cooperation between central organs, bodies, faculties and disciplines. For this change process, HEIs need strategic goals and an organisational framework that includes all decision-making levels from specialist areas and faculties to HEI administrations. At the same time, responsibilities for the necessary change processes should be anchored at the highest management levels of the HEI meaning in the German case the Vice President of Academic Studies in the HEI Presiding Committee or the Prorector for Teaching in the Rectorate (dean). Therefore it is necessary that the people involved have the competences and organisational resources necessary to shape the digital turn. HEI administrations are urged to examine digitalisation strategically as an interdisciplinary issue. The currently prevalent idea of enhancing teaching with digital elements on a selective basis should be developed into a strategic approach that interlocks classroom teaching and online learning phases to establish teaching and learning using digital media as a standard practice.

ACTIVELY RAISING HEI PROFILES

It is vital to an HEI strategy in the digital age to raise its profile focusing on digital media in teaching activities. The digital turn is a catalyst

for further differentiation in the higher education sector that HEI administrations must shape. A great number of possible strategy profiles can be established within the indicated challenges for HEIs. One conceivable strategy profile could be to focus on "Preparing freshman students". These days, with the number of school years in Germany having been reduced from 13 to 12 and a greater number of students entering higher education institutions via alternative routes and with more diverse backgrounds, there is a partial lack of prior knowledge and specialist knowledge at HEIs. Particularly in structurally weak regions, the HEIs could use good digital preparatory courses as a competitive advantage in order to attract interest from German and international students.

Another strategic profile could be a course with a very high flexibility regarding course organisation. Today, only around 10 percent of all undergraduate courses are also offered on a part-time basis. HEIs can develop their profile particularly effectively with a study model that features digital teaching and learning scenarios that can be integrated easily by students who work full-time, who have family commitments or who are nursing a family member. In addition to the examples shown, many other HEI profiles are possible, for example with a focus on further education, personalised studies with individual supervision or research-oriented studying. What these HEI profiles all have in common is that they differentiate their profiles based on a strategic use of digital media tailored towards a specific target group.

EXPANDING FURTHER EDUCATION, FLEXIBLE STUDY MODELS AND NEW SERVICES

In a dynamically changing and increasingly complex knowledge society, the importance of lifelong learning is growing. In addition, the student population is becoming more and more diverse. By offering digital study courses that are

flexible regarding time and place, HEIs cater for non-traditional students such as people in full-time employment who wish to engage in further academic education and people who, owing to family or financial reasons, are unable to study full-time on campus. At the same time, this would meet the high demand for these study models. A possible solution would be to develop academic programmes consisting of several smaller units which can be completed with a lower number of ECTS credits. Furthermore, new demand would be generated – not only in the core business of HEIs, but also in peripheral areas – which will need to be met in the future. Further needs for education and demand for intermediary services arise above and beyond the traditional study period between school and working life.

Owing to the heterogeneity of prospective students, preparation for higher education is becoming increasingly important as is the option of conveying suitable jobs based on learning data.

In this regard, HEIs can play a proactive role and, for example, expand their career services (which already exists in many cases) based on identified learning and competence profiles of students with a view to offering them more precise job proposals. It is already clear that there is a demand for these services and that this demand is likely to increase and induce further providers to enter the education market. This creates a great opportunity for HEIs: they should reflect upon the extent to which they could design and offer these services themselves. To this end, it is necessary firstly for statutory regulations to allow such models and secondly to guarantee the secure usage of learning data. It is not least the aspect of data security that suggests that such services should be based at HEIs.

STRATEGICALLY COMBINING INTERNATIONALISATION AND DIGITALISATION IN ACADEMIC PROGRAMMES

Internationalisation is already of great strategic importance for many HEIs in Germany. Digitalisation now offers new ways to further promote and shape internationalisation. In this way, online courses and digital assessments can help

to increase the mobility of German students and HEIs can internationalise their academic range by developing modules and academic courses together with partner institutions abroad. However, these developments concern all levels of HEIs and need to pursue overriding objectives. In order to use this potential offered by digitalisation for the purposes of internationalisation, HEIs must therefore pool their strategic thinking at the highest level.

USING DIGITAL MEDIA TO INCREASE THE VISIBILITY AND ATTRACTIVENESS OF HIGHER EDUCATION INSTITUTIONS

In today's competitive environment, the profile of HEIs and their strengths, their interest groups and their stakeholders should be visible and clear, both at national and international level. In the age of information, this is a particular challenge given that communication and image-building even take place when an organisation is not actively involved in communication itself. Therefore it is vital for communication activities to be actively bundled and designed.

Here, HEI marketing should always be designed based on the strategy of the HEI in question. The basis for this is the institution's website, which nowadays should always be available in several languages. As well as this, HEIs should use the entire repertoire of digital channels and media. Cross-media marketing includes both print products and event marketing, but also social media.

These activities should always be tailored towards the specific target group, as digitalisation also involves personalising communication channels. This applies in particular for social media, the use of which is interactive and personalised. Especially when it comes to targeting international students as part of an internationalisation strategy, the choice of media must be tailored towards the media usage of these target groups. In order to generate interest, to provide and convey information and to establish personal contact, HEIs should therefore focus even more on social media and digital resources. Tools such as search engine

optimisation can increase an HEI's visibility, particularly on the global higher education market. It is important for HEIs to recognise the increased importance of marketing for higher education in the digital age and to make the necessary personnel and financial resources available for this. Furthermore they should take steps to actively increase relevant competence among their staff and to establish structures in which the people working in HEI marketing, administration processes and academia pool their thinking with a view to attracting international students.

JOINING FORCES

Much of the potential that is identified can be implemented more effectively in cooperation with other HEIs. Given that many challenges

cannot be solved by individual HEIs alone, it makes sense to form higher education networks. Such networks can assist their members, among other activities, in mutual recognition of courses, certifying courses, joint production activities and exchanging teaching content. It would also be conceivable for such cooperations to be used for establishing joint support centres for digital teaching. In this way, financial and personnel resources can also be spared by acquiring software solutions. In addition, digital media used in inter-HEI cooperations offer new ways to cater for minor subjects or internationalisation of academic programmes.

Cooperations with professional practice, with companies and civil society players can also be rewarding for HEIs.

SHAPING AND IMPLEMENTING DIGITALISATION

IMPLEMENTING INCENTIVES FOR DIGITAL TEACHING

Research is still a top priority for professors, particularly at universities, as well as for academic staff. By contrast, teaching plays a largely subordinate role in academic career development. This being the case, the amount of time invested in developing new teaching formats and scenarios is frequently limited. HEIs should provide their teaching staff with incentives for including digital media in their teaching activities. For instance, they could make a specific number of blended learning events a necessary condition for appointment or could grant teaching staff a sabbatical semester to permit them the necessary time to engage with digital media and implement innovative teaching formats. HEI administrations can also include digital teaching in target agreements with professors. Deliberately promoting involvement by students in media didactics, for instance through competitions, can help to enrich teaching and learning formats. However, HEI administrations have the greatest level of scope when appointing new professors.

Here, it should be imperative for successful candidates to have experience in using digital media and to show a willingness to further develop their own integrative teaching approach.

INVESTING IN SUPPORT STRUCTURES

The teaching staff requires support in preparing and conducting digital courses. This support must lead to the development of pedagogic expertise while at the same time facilitating the technical implementation of good digital academic teaching programmes. Many German HEIs have already established central units that offer this kind of support. In many cases, however, these are not sufficiently equipped or their staff is not sufficiently trained in dealing with representatives from different disciplinary cultures. Such support should be provided through central institutions which are staffed with people who are well trained in the technical and didactic aspects involved. Academic staff should be provided with workshops, support for technical implementation and expert advice in designing their courses. At the same time, these centres must contribute to procuring software and hardware. They can be located either centrally, at faculty level

or within higher education institutions across the board. Involving faculties when designing support structures is essential in order to create offers that are tailored towards the needs of academic staff.

In many cases, peer-to-peer consulting among professors within faculties may not be self-evident, but at the same time, it is a special type of support that has proved its worth in many other contexts. Professors who are especially familiar with developing and preparing digital academic programmes advise their peers on digitalising their teaching activities. The in-depth understanding of the teaching content on the part of the digitally experienced colleagues has the effect of fostering trust and, when combined with interactive exchange on specialist and didactic topics, leads to an improvement in the quality of teaching.

BUILDING STRUCTURES FOR SUPPORTIVE PERSONNEL

New activity profiles emerge at the HEIs within these support structures. Professionalising HEI didactics through digital media requires, for example, instructional designers who assist the academic staff in further developing as well as implementing courses and curricula. HEIs should therefore expand their staffing plans accordingly and create appropriate new personnel categories. These experts offer technical and didactic assistance for academic staff, they assume some of the work involved in preparing and implementing digital teaching and make it possible to further develop academic programmes strategically and didactically in the medium to long term.

CONSOLIDATING IT SYSTEMS, INSPECTING CLOUD SOLUTIONS AND FORMING NEW CONSORTIA

Even today, many faculties still use software that they develop themselves, usually for historical reasons. The steadily growing requirements of students and lecturers in regard to IT systems have resulted in a massive increase in

the complexity of newer versions, which also means that the faculties are unable to cope. HEIs should introduce IT solutions throughout the organisation – such as a central learning platform or a central directory service – and should come together as networks when sourcing and operating IT systems and also consider cloud solutions. In this way, costs can be reduced and more far-reaching solutions can be made available in the long term.

CREATING NEW LEARNING SPACES

The importance of learning and interaction spaces that provide not only the technical requirements but also the atmosphere necessary for learning is growing in tandem with digitalisation. Accordingly, HEIs are likely to need fewer lecture halls in the future but require a greater number of flexible seminar rooms that facilitate interactive collaboration within the course as well as in small groups. However, even outside HEIs – and in libraries in particular – students in the digital age require a sufficient number of learning places equipped with digital media to work on their own or in groups. This being the case, HEIs are urged to set up a sufficient number of digitally networked learning spaces that meet these requirements.

SETTING UP POINTS OF CONTACT FOR LEGAL QUESTIONS

Teaching staff and HEIs require legal certainty with regard to data protection, copyrights and usage rights. This area is of central importance, particularly when it comes to digitally aided teaching. Accordingly, HEIs should set up contact points for the consultancy of academic staff with regard to data protection, copyrights and usage rights as well as further developing and regularly updating any handouts that are used. In addition to points of contact in the HEIs themselves, the possibility of comprehensive solutions at federal state or national level should be considered.

FOR POLICY-MAKERS

PROMOTING THE DEVELOPMENT OF TEACHING IN HIGHER EDUCATION

PROMOTING THE STRATEGIC FURTHER DEVELOPMENT OF HIGHER EDUCATION INSTITUTIONS

HEIs need to further develop – or in some cases reshape – strategies for the digital age and their academic programmes. To this end, the use of digital teaching and learning formats should only be promoted as an integral part of complex study programmes and overall concepts that are measured against the attainment of more demanding objectives of teaching and learning and that are integrated in the strategic profile of the HEI. In order to promote strategic efforts on the part of HEI administrations with regard to embracing the digital turn in academia, federal state ministries can incorporate these into their target agreements with the HEIs and couple them with specific financial incentives. In this way, HEIs remain responsible for the strategic direction of their institutions. However, this should not be defined exclusively in terms of quantifiable figures such as a specific percentage of online courses, but also in terms of qualitative targets such as the quality of scenarios applied in the subject or the quality of the material produced, including in the form of open educational resources (OERs).

In order to fulfil the new potential of internationalisation through the use of digital education, the subjects of internationalisation and digitalisation of HEIs will also need to be reflected in future at policy level and in suitable target agreements. In addition, initiatives such as Qualitätspakt Lehre (the “Teaching Quality Pact” that finances excellence in teaching), Offene Hochschule (Open HEI) or Hochschulpakt (HEI Pact) can require a certain proportion of resources to be used for digital teaching.

CREATING INCENTIVES FOR INNOVATIONS IN TEACHING

Federal and federal state policies can create incentives for further innovations in higher education by making resources available for

developing and implementing innovative strategies and scenarios, e.g. through competitive tenders or teaching awards. In addition, resources could be made available, for example, in an innovation fund for digital teaching, which could be used primarily to advance innovations in teaching with low financing requirements and thereby provide swift, uncomplicated assistance to innovative projects.

On the whole, it would seem reasonable that these measures should not only be used to promote the use of digital elements individually, but should also be integrated in didactically sound scenarios as a benchmark, thereby highlighting the correlation with general didactic concerns regarding higher education.

SETTING UP A SUPPORT PROGRAMME FOR DIGITAL TEACHING MATERIALS

Most teaching staff prepare their teaching materials such as presentations, videos or exercises themselves. Internationally, many higher education institutions are now involved in commercial platforms that make high-quality materials available to partner institutions. However, rather than investing in commercial platforms, it would make sense to invest in the general and free availability of high-quality teaching materials for HEIs. Particularly at federal policy level, it would be conceivable to set up a support programme for digital teaching and learning materials at HEIs. Such a programme should finance the preparation of all kinds of digital teaching materials: videos, MOOCs, exercises, interactive textbooks, but also software solutions such as learning programmes, learning games and other formats.

In order to ensure that such products are firmly established in everyday teaching activities, these support programmes should be geared towards faculties and specialist areas. The new teaching content created as part of the

programme should be available as OERs under free licence. Only in this way can the newly created materials be further used, adapted and improved by all interested parties in a legally compliant way. Software created as part of the programme should be issued under open source licences. The newly created teaching materials would then be made available to the general public through universally accessible platforms. It should be verified whether this can be done via the federal state educational server or alternative channels.

PROMOTING THE FURTHER DEVELOPMENT OF PEDAGOGY AND DIDACTICS USING DIGITAL MEDIA

New pedagogic and didactic findings help to further develop and improve teaching. Integrating digital elements in teaching gives rise to many new questions regarding the effectiveness of pedagogic and didactic concepts. However, the use of digital media also creates wider possibilities for monitoring the effectiveness of these. The Federal Ministry of Education and Research (BMBF) already initiated basic research into digital teaching in 2016 with the support programme for researching digital higher education, its effectiveness and the impact of current approaches and formats as well

as of new trends and paradigms in didactics and technology. With regard to technological advances, the ongoing development and the necessary innovative capability in teaching, research into new pedagogic and media-didactic concepts will also be of great importance in the future when it comes to increasing the quality of teaching. The federal government and federal states should further expand the support for research into digital teaching and push to communicate the findings.

USING DIGITAL TOOLS TO OPEN UP ACCESS TO HIGHER EDUCATION INTERNATIONALLY

In recent years, HEIs in Germany have become far more open to new, qualified target groups. In order to secure the best students for studying in Germany (and living there at a later stage), the same approach should be pursued for international study applicants. To meet the challenge of assessing and comparing at international level the formal requirements of these applicants for studying in Germany, a legal framework and suitable incentives should be created to use digital tools to undertake an individual, qualitative selection of the best international students.

EXPANDING INFRASTRUCTURES FOR DIGITAL TEACHING AND LEARNING

PROMOTING SUPPORT STRUCTURES AND SUPPORT PERSONNEL FOR DIGITAL TEACHING

Federal states and the federal government are urged to clarify key financing questions together and to provide HEIs with the funds needed to create support structures for digital teaching. This also includes qualifying staff for developing and producing digital teaching formats and ensuring that central support structures are universally available and well known at federal state or HEI level. These are responsible for training and assisting academic staff, for providing online platforms and for procuring and implementing technical infrastructure in cooperation with any additional institutional experts. Good support structures create the necessary scope for academic staff to explore the relevant

teaching content in greater depth. Federal state initiatives and state institutions should furthermore facilitate the cooperation and exchange of expertise for HEIs beyond state borders. Given that HEIs and teaching staff are often faced with the same questions when it comes to digital teaching, it should be ascertained whether it would make sense to institutionalise a competence centre for specific aspects at a federal state or even at a national level. Regarding the preparation of digital teaching and learning materials, it could further be examined at federal state level whether regional production centres (for example as centres for digital teaching or a part of this) could be made available for HEIs that do not have sufficient capacity themselves. Alternatively, suitable institutions

could be used on a pro rata basis by other HEIs so that not all HEIs are required to provide the necessary structures.

EXPANDING INFRASTRUCTURES SUSTAINABLY

All HEIs should have a fast and reliable Wi-Fi network as part of its basic equipment. This is not yet the case in many HEIs: although Wi-Fi networks are available in the vast majority of cases, they are frequently neither fast nor reliable – this is because they were not built for usage scenarios in which one or several devices per student are permanently connected with the network. Basic equipment for HEIs in the digital age also includes using cloud storage with a suitable data volume. However, other aspects – for example software licences for digitalising academic programmes – are frequently not available in sufficient quantities. As well as this, there are investments in restructuring teaching rooms in the medium term: for instance, it is likely that libraries will need less room for books in future but more for facilitating group work. For this, HEIs need the financial resources to expand their infrastructure sustainably and to finance ongoing costs. The federal government and federal states should not look to project financing here, but rather provide HEIs with financial leeway in the long term. Past experience has shown that predominantly third-party financing is an obstacle to anchoring digital media sustainably in higher education studies.

FURTHER DEVELOPING AN INTER-HEI PLATFORM FOR ONLINE TEACHING

On an international level, US platforms such as edX and Coursera are dominating the field of MOOC-based online courses. Some German HEIs are also represented on these platforms, although barriers to entry are high. Due to the cultural and physical distance, the interests of European HEIs are not always a priority for the platforms. Above all, protection for student data cannot be guaranteed by most of the non-European offers. It can also be observed that not only US providers but also their European counterparts are increasingly anchoring their

business model in further education. Accordingly, there is a risk that the number of courses offered for undergraduate studies will drop.

Therefore, it would be necessary also to actively assist German providers with competitive products on the market or inter-HEI cooperation solutions to increase their reach and raise their profile. It is recommended to set up a central inter-HEI and inter-institution platform for online learning or put this together by combining existing initiatives. This platform would group together and expand previously existing activities and would be funded by the state, HEIs and/or through foundations. These do not necessarily have to take the form of a traditionally monolithic learning platform. A considerable alternative would be a network of existing or new platforms that would ensure seamless integration in the existing HEI IT landscape via interfaces. Uniform access would make it possible to create an overview of all digitally available teaching formats, as well as making it easier to address and clarify overriding questions relating to quality assurance, accreditation and support.

The aim would be to create a widely accepted, contemporary, secure and sustainable solution for all German HEIs – and, in the medium term, possibly for all European HEIs as well. With an educational platform such as this, HEIs could use the central infrastructure for their own digital teaching while also making their courses and materials available to students and academic staff at other HEIs, thereby helping to improve the inter-HEI and pan-European recognition of online study programmes. Such a platform should provide an infrastructure for academic programmes at German and European HEIs which permits all forms of online teaching, uses OER materials and allows them to be exchanged in order to facilitate widespread usage. This could be supplemented, for example, by using competitive tenders to create incentives for teaching staff to contribute to the production of digital course content on an ongoing basis.

ESTABLISHING A LEGAL FRAMEWORK FOR DIGITAL TEACHING

PROVIDING LEGAL ADVICE CENTRALLY

Digital learning and assessment scenarios affect a wide range of legal questions, such as those relating to copyright, assessment and personnel law. Because of this, it is necessary to illustrate clearly how concrete problems are to be solved. Since there are many special cases, it is also essential for academic and support staff to have expert legal advice to fall back on. If legal advice regarding digital teaching cannot be offered to the extent required at individual HEIs, academic staff must have the option of seeking advice centrally. In the interests of harmonising the legal framework to the maximum extent possible, it would also make sense to set up a national competence centre – for instance, this could be based at one of the large higher education institutions or academic organisations.

TEACHING LOADS

It is difficult to make a sweeping acknowledgement of the work involved in digitalising academic programmes and, in particular, to offset digital teaching elements against teaching loads. While preparing and supervising digital teaching materials involves extensive additional effort, it is also true that these materials can be used again and again. It is also easier to use and integrate third-party materials. Accordingly, the challenge in this regard lies in assessing this additional effort accordingly.

This restructuring of the functional profile of teaching staff and the resulting teaching performance can no longer necessarily be measured based on the number of hours that they spend in lecture halls or seminar rooms. Digital teaching and offsetting additional time against teaching loads should be geared fundamentally towards the HEI strategy, within the framework of which incentives for using digital teaching can be created. However, the federal state regulations for teaching responsibilities set strict limits for HEIs in this regard. This means that the federal states are urged

– insofar as this is not already the case – to adjust these regulations so that it is possible to use new teaching formats and to offset additional work for digital teaching.

In addition, the conditions for offsetting digital work should be liberalised in order to reduce red tape for academic staff who are active or interested in this area. This would give HEIs leeway to create incentives within the scope of their strategic orientation for the widespread use of digital teaching and to shape their own rules for safeguarding the overall range of courses.

CAPACITY LEGISLATION

The additional effort entailed by designing and supervising digital teaching and learning elements also places new requirements on capacity legislation in the long term. In order for digital teaching scenarios to establish themselves throughout everyday student life, the curricular standards should be adapted, taking into account the ratio between resources and students in digital teaching scenarios. Admission capacity should not be geared only towards face-to-face teaching but should also make it possible to have partial admission for digital teaching formats, ensuring that it is possible for individual courses to be created and used by different HEIs.

DATA PROTECTION

There is great potential for using learning data to conduct further research into teaching and learning and for media-based personalisation. New data protection regulations must give the HEIs security in using this potential while at the same time protecting students' legitimate interest in having control over their own data. For this, it is particularly important always to ensure that student learning data are only recorded in anonymised form and used for the purposes of evaluation. When using data as part of technical personalisation tools, the data must always be saved in pseudonymous form and may not

be directly traceable to the respective students. In addition, students must always be informed about which data are being collected and recorded for which purpose and, in reasonable cases, should be able to object to their learning data being collected. Students should also be able to view their data on request, and have their data made available to them or deleted.

Personal data must be deleted again after a reasonable retention period, provided there is no legal requirement to preserve the data, for example for pension insurance certificates. Furthermore, the public educational institutions must always be in control of storing the data. Responsibility for saving and managing the data may not be transferred to third parties unless these are subject to the same legal requirements and can guarantee the security of the data in the same way.

COPYRIGHT LEGISLATION

Current copyright legislation is a problem in everyday HEI activities when things that are

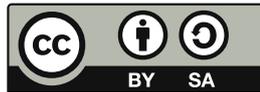
second nature in analogue teaching – such as providing key semester texts, the use of copyrighted works in lessons or access to works in the HEI library – are permitted in analogue teaching but are subject to strict limitations in digital teaching. As a result, academic staff frequently refrains from making their lectures and slides available to a wider audience because they are unsure whether they are legally entitled to do so. Additionally, distribution of materials is often done through technically impractical solutions.

HEI administrations must be able to cope with complex billing rules. One solution for this would be to introduce a “general education and academic limitation” along the lines of the “fair use” regulations that are prevalent in the USA. Such a limit would allow HEIs and academic institutions to use works for the purpose of academic research and teaching. The copyright owners would be reimbursed at a flat rate, as has long been standard practice in private copy regulations.

ENDNOTES

- ¹ Compare Stifterverband für die Deutsche Wissenschaft e.V. (2016): Hochschul-Bildungs-Report 2020. Hochschulbildung für die Arbeitswelt 4.0, Jahresbericht 2016, in Kooperation mit McKinsey & Company, Essen: Edition Stifterverband – Verwaltungsgesellschaft für Wissenschaftspflege mbH. Available online at: <http://www.hochschulbildungsreport.de/download/file/fid/141> (accessed: 26 September 2016), page 8 f.
- ² *ibid.*, page 26 ff.
- ³ Compare here and in the following – Kerres, Michael; Getto, Barbara (2016): Digitalisierung von Studium & Lehre. Wer, warum und wie? In: van Ackeren, Isabell; Heinrich, Sandrina; Kerres, Michael (Hrsg.): Flexibles Lernen mit digitalen Medien ermöglichen – Strategische Verankerung und Erprobungsfelder guter Praxis an der Universität Duisburg-Essen, Münster: Waxmann.
- ⁴ Definition: “Learning Analytics is an educational application of web analytics aimed at learner profiling. [...] The goal is to build better pedagogies, empower active learning, target at-risk student populations, and assess factors affecting completion and student success.” Johnson, Larry et al (2016): NMC Horizon Report 2016, Higher Education Edition. Austin, Texas: The New Media Consortium. Available online at: <http://cdn.nmc.org/media/2016-nmc-horizon-report-he-EN.pdf> (accessed: 26 September 2016), page 38.
- ⁵ This is the adjusted figure for freshman students with German university entrance qualifications. When the number of freshman students with foreign university entrance qualifications is included, the quota was 33.3 percent in 2000 and 58.3 percent in 2014.
- ⁶ Compare Heublein, Ulrich et al. (2014): Die Entwicklung der Studienabbruchquoten an den deutschen Hochschulen. Statistische Berechnungen auf der Basis des Absolventenjahrgangs 2012. Forum Hochschule 4/2014, Hannover: Deutsches Zentrum für Hochschulentwicklung (DZHW). Available online at: http://www.dzhw.eu/pdf/pub_fh/fh-201404.pdf (accessed: 26 September 2016), page 3.
- ⁷ Maaz, Kai et al. (2016): Bildung in Deutschland 2016. Ein indikatorengestützter Bericht mit einer Analyse zu Bildung und Migration. Deutsches Institut für Internationale Pädagogische Forschung, Bielefeld: W. Bertelsmann Verlag. Available online at: <http://www.bildungsbericht.de/de/bildungsberichte-seit-2006/bildungsbericht-2016/pdf-bildungsbericht-2016/bildungsbericht-2016> (accessed: 26 September 2016), page 144.
- ⁸ Compare Themengruppe „Governance & Policies“ (2015): Rechtsfragen zu digitalen Lehrformaten (Arbeitspapier 7), Berlin.

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ISSN (Online) 2365-7081

Year 3

Cite as

Hochschulforum Digitalisierung (2017):
The Digital Turn – Pathways for Higher
Education in the Digital Age. Arbeitspapier
Nr. 30. Berlin: Hochschulforum Digitalisierung

Published by

Hochschulforum Digitalisierung
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Barkhovenallee 1 · 45239 Essen, Germany
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Graphics and layout

atelier hauer+dörfler gmbh
Charlottenstraße 17 · 10117 Berlin, Germany

Photos

www.shutterstock.com
Page 2: katatonia82 / Shutterstock.com

Printing

Druckerei Schmidt, Lünen

Hochschulforum Digitalisierung is a project undertaken jointly by Stifterverband – a business community initiative advocating long-term improvement of the German education and research landscape – together with the Centre for Higher Education (CHE) and the German Rectors' Conference (HRK).

www.hochschulforumdigitalisierung.de

