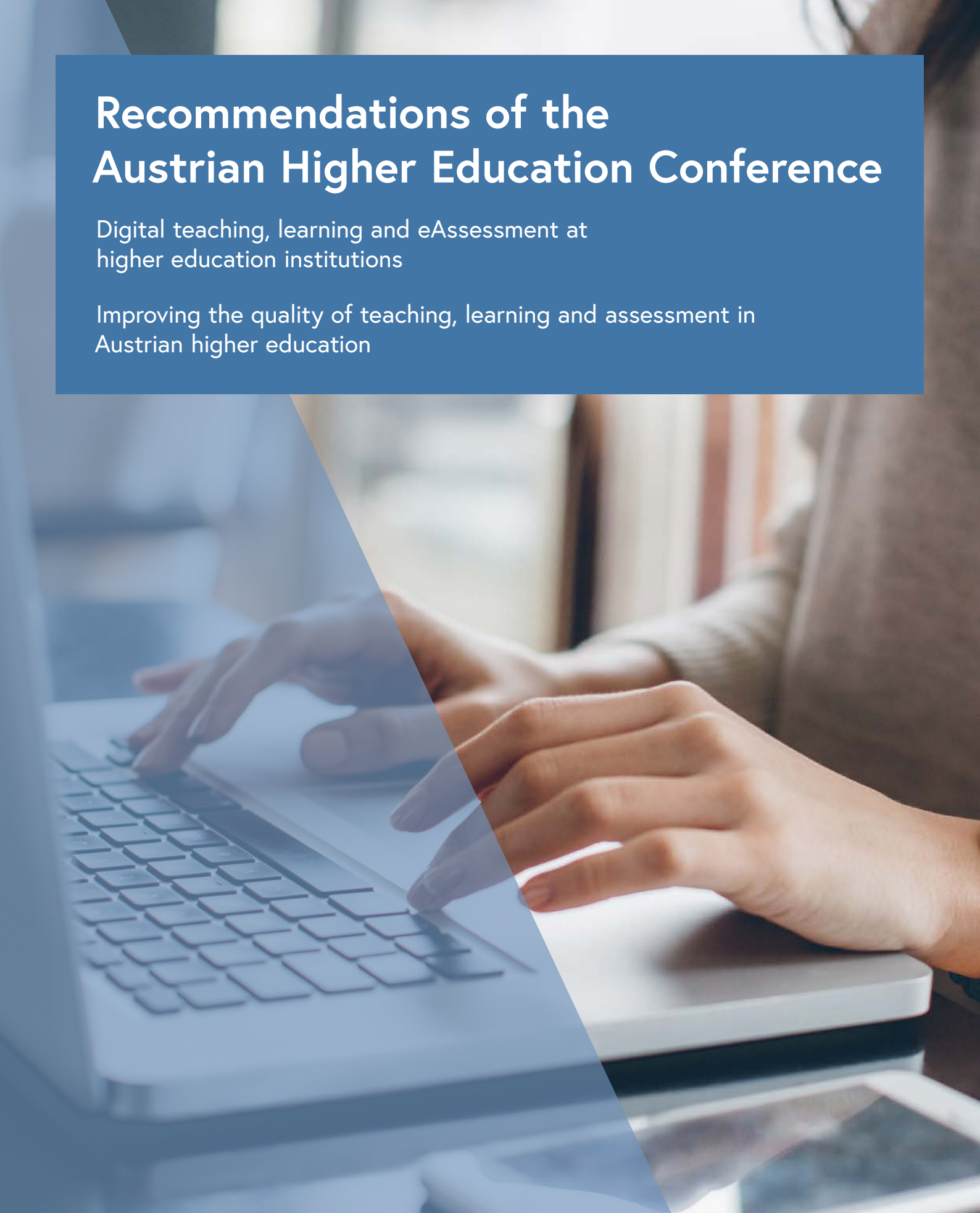


Recommendations of the Austrian Higher Education Conference

Digital teaching, learning and eAssessment at
higher education institutions

Improving the quality of teaching, learning and assessment in
Austrian higher education



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Improving the quality of teaching, learning
and assessment in Austrian higher educations

Vienna, 2021

A project of

 **Bundesministerium**
Bildung, Wissenschaft
und Forschung

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Media owner, editor, and publisher:

Austrian Federal Ministry of Education, Science and Research (BMBWF)
Minoritenplatz 5, 1010 Vienna

Editorial board and authors: members of the “Digital Teaching, Learning and eAssessment”
Working Group of the Austrian Higher Education Conference

Coordination: Unit IV/1 – Higher Education Planning

Photo Credit Cover: iStock/eclipse_images

Graphic design: BKA Design & Grafik

Vienna, December 2021

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Preliminary remarks

This document presents selected topics of higher education teaching that have been developed primarily from the experiences of teaching under COVID conditions in the past three semesters. It does not claim to be a handbook for digital higher education didactics, but rather picks up on current topics that have become the focus of attention due to the COVID-19 pandemic. Further discussion is still needed.

The ad-hoc shift to fully online teaching in March 2020 showed very clearly that teachers, students and higher education administration were challenged in many different ways. Therefore, this document takes up these **stakeholder perspectives** in order to present the collaboration between all those involved in a successful (digital) teaching and learning process in a transparent way. In the concluding fifth chapter, recommendations are therefore formulated with the various actors in mind.

The discussion in the Working Group was characterised by the fact that people with different perspectives (teachers, governing bodies, students, etc.) and with different institutional backgrounds came together (virtually). An exchange of their diverse experiences of the past semesters was thus made possible, after numerous months of solution-oriented work in crisis mode at each individual higher education institution. **Still, it seemed too early for systematic, unifying discussions. Therefore, the suggestion is to continue these discussions based on this document, especially since new terms and phenomena as well as new lines of discourse have emerged through the inter-sectoral communication that has taken place.**

This document is addressed to all persons at higher education institutions who are interested in qualitative teaching and learning process. These include, in particular, teachers, students, higher education administration, and employees in service facilities and quality assurance institutions at universities, universities of applied sciences, university colleges of teacher education, and private universities, as well as the responsible ministry itself. The document intends to contribute to the continuous development of the quality of higher education teaching and represents a current state of discussion that clearly goes beyond the corresponding recommendations¹ of the Austrian Higher Education Conference of December 2014.

1 Cf. the “Recommendations of the Austrian Higher Education Conference on Improving the Quality of Higher Education Teaching”, Federal Ministry of Science, Research and Economy (ed.), Vienna 2015. https://pubshop.bmbwf.gv.at/index.php?article_id=9&sort=title&-search%5Bcat%5D=78&pub=780.

Summary

Starting point

In December 2020, the Austrian Higher Education Conference established the working group on “Digital teaching, learning, and eAssessment at higher education institutions with the aim of ensuring and improving the quality of teaching, learning, and assessment in Austrian higher education”. While the COVID-19-related shift to distance learning at Austrian higher education institutions in March 2020 posed a large number of challenges, it also enabled new experiences of digital teaching, learning and eAssessment. Based on this, the task of the Working Group was to develop **recommendations** as to how **digital elements** can be optimally integrated to improve the **teaching and learning processes**.

Relevant thematic areas

In establishing its recommendations, the Working Group focused on five different areas:

1. Improving the **quality of teaching** through the use of appropriate media for teaching purposes, communication structures, student-centred interactive formats and quality assurance;
2. **eAssessment** taking didactic, technical, legal and organisational aspects into consideration;
3. **Internationalisation** through digitalisation;
4. Students’ and teachers’ **digital literacy**;
5. Establishing appropriate **framework conditions** in order to **improve the quality** of teaching in higher education by means of digital elements. This relates to (technical) infrastructure, data protection and copyright as well as social aspects.

Digital teaching scenarios can be an appropriate complement to traditional teaching concepts. The key is that the format is adapted to the content and setting as well as to the target group. **Methodological diversity** and a **variety of different perspectives** are the guiding principles of shaping digital teaching formats. At all times, the primary teaching goal is to ensure that learners **comprehend the subject matter**.

Recommendations (summarised)

The recommendations developed by the Working Group are addressed to various actors within the Austrian higher education landscape and constitute potential key aspects of future digital teaching, learning and eAssessment.

Recommendations for teachers

Teachers are invited to **reflect their own digital teaching practice** and to design their lessons accordingly. They should focus on a **small number of selected digital tools** and use these confidently and competently. Accordingly, they are encouraged to make continuous use of **further training opportunities** in order to expand their **digital (teaching) skills**.

Moreover, the establishment of clear and transparent **time and communication structures** is critical in dealing with students. It is particularly important to promote the significance of **academic integrity** and fairness.

Digital **assessment methods** can supplement the range of existing modes and should be used on a competence-oriented basis. Students should be **notified in good time** about the use of eAssessment and the opportunity to take a **mock exam is recommended**.

Digitisation also opens up new opportunities for the internationalisation of teaching, stimulating the **current academic discourse**.

Recommendations for students

Students are encouraged to **strengthen their personal responsibility as well as their organisational skills** and to consciously plan their semesters. This includes obtaining information independently and making use of the services provided by their higher education institutions.

Students are expected to uphold **academic integrity**, also out of **fairness** to their fellow students.

Physical mobility will still be preserved, particularly for international degree programmes. In addition, the use of virtual elements for the internationalisation of teaching and learning is recommended.

Recommendations for institutions and higher education administration

The development of an **overall teaching strategy** in coordination with a **digitalisation policy** is recommended. The **quality of teaching** should be a key concern and can be further improved by the use of digital elements. The strategic educational goal of students developing an in-depth understanding of digital media and using them in a reflected manner should be enshrined here. **Preservation of academic and teaching freedom** is an overarching goal.

A new approach should be identified for the optimal use of **various forms of interaction and communication** for study and teaching purposes. Students' **heterogeneous needs** must also be taken into consideration and addressed accordingly. This requires **clear communication and division** of responsibilities as well as supporting peer exchange between teachers.

Institutions are advised to establish **appropriate framework conditions** for teaching. This includes **giving consideration to the volume of work which digital teaching requires** as well as **proactive support** for teachers in relation to questions they may have concerning digital teaching elements. In addition, teachers should receive **further training in media use for teaching purposes** and students shall be empowered to become **more confident digital users**.

The members of the entire higher education institution should be aware of, and understand, the **range of different examination scenarios** and their various areas of use. In this context, it is recommended to establish some form of **peer learning** and publish good practices of eAssessments within the higher education institution. Moreover, in the context of digital assessments a core requirement is a broad discussion regarding the eAssessment tools used, together with the relevant support measures and any open legal issues. Equally, adequate **infrastructure** must be ensured.

For the strengthening European and international cooperation between higher education institutions, digital elements may be used. In addition, **physical mobility** will remain a priority for internationalised degree programmes.

Recommendations for the Austrian Federal Ministry of Education, Science and Research

The Federal Ministry of Education, Science and Research is advised to continue to promote a **systematic dialogue** between institutions, especially in relation to their **experiences with the application of eAssessment methods**. The Ministry is also recommended to establish the necessary **framework conditions in regard of digital assessment formats**, particularly from a **legal** point of view. In addition, the funding of measures required for an equal-opportunity educational system should be ensured.

Further policy recommendations for the higher education system

Moreover, a **concept should be developed which provides for cooperation between higher education institutions throughout Austria** in relation to teaching and learning systems. A nation-wide **common approach to eAssessment** should be achieved. When planning future places of learning digitisation should be taken into consideration. In addition to these recommendations which mainly relate to higher education institutions, **a structured approach to the development of digital skills** is required which spans entire educational careers.

These recommendations can only be adequately implemented by means of **collaboration** between all concerned stakeholders.

1 Working Group

The Austrian Higher Education Conference approved the establishment of the Working Group on “Digital teaching, learning, and eAssessment at higher education institutions with the goal of safeguarding and improving the quality of teaching, learning, and assessment in Austrian higher education” in December 2020.

The recommendations address all sectors (universities, universities of applied sciences, university colleges of teacher education, private universities) and are aimed at teachers, students, higher education institutions and higher education administrations as well as the responsible ministry. They were discussed and decided upon at the meeting of the Austrian Higher Education Conference on 24 November 2021 and therefore recommended for appropriate implementation.

1.1 Mandate for the Working Group

Objective

To safeguard and improve the quality of teaching, learning and assessment in Austrian higher education

Work order

The recommendations are intended to serve as assistance for the persons and committees involved with higher education institutions. The recommendations are based on the experiences with and insights in distance learning to date (especially from 2020 under COVID-19 conditions) and incorporate current studies, particularly sociological, psychological and educational research findings on teaching and learning.

1. Clarification of the terminology used in the context of digital teaching, learning and eAssessment
2. Review and evaluation of the current practical and scientific discourse
3. Discussing the added value of digital formats in terms of their potential to improve higher education teaching
4. Deriving recommendations and measures, if applicable

Working method

The Working Group functions as an editorial team that develops text proposals that are complemented by practical and scientific expertise. It operates in network structures and establishes these on a sustainable basis.

1.2 Composition of the Working Group

The following participants were nominated as members of the Working Group by the members of the Austrian Higher Education Conference (in alphabetical order):

Keya Baier (Austrian Students' Union, from 1 July 2021)
Univ. Prof. Mag. Dr Gerhard Brandhofer, BEd (Rectors' Conference of Austrian University Colleges of Teacher Education)
University of Applied Sciences Prof. Mag. Dr Andreas Breinbauer (Austrian Conference of Universities of Applied Sciences)
Univ. Prof. Dr Astrid Dickinger (Austrian Private University Conference)
Priv. Lecturer Dipl.-Ing. Dr techn. Martin Ebner (Universities Austria)
Kim Eichhorn, MSc (Federal Ministry of Education, Science and Research)
Ass. Prof. Dr Walter M. Grömmner (Conference of Senate Chairpersons)
Sabine Hanger (Austrian Students' Union, until 30 June 2021)
Mag. Carmen Heidenwolf, BA (Chair) (Federal Ministry of Education, Science and Research)
Kristina Kern, BA (Austrian Students' Union, until 30 June 2021)
Univ. Prof. Dipl.-Ing. Dr techn. Gernot Kubin (Conference of Senate Chairpersons)
Univ. Prof. Priv. Lecturer Dr Gerda Kysela-Schiemer (Rectors' Conference of Austrian University Colleges of Teacher Education)
University of Applied Sciences Prof. Priv. Lecturer Dr Martin Lehner (Universities Austria)
Raluca-Mihaela Ludescher (Austrian Students' Union, from 1 July 2021)
Univ. Prof. Dipl.-Ing. Dr techn. Günther Meschke (Austrian Science Council)
Mag. Dr Dimitri Prandner (Universities Austria)
Extraordinary Univ. Prof. Dr Christa Schnabl (Universities Austria)
Univ. Prof. Dr Christoph Stöckmann (Austrian Private University Conference)

The Working Group took current documents into account in its discussion and consulted the following experts on an ad-hoc basis: Dr Attila Pausits (Danube University Krems), Dr Stephan Oppl (Danube University Krems), Dr Sandra Schön (Graz University of Technology), who prepared the study "Distance Learning at Austrian Universities and Higher Education Institutions in the Summer Semester 2020 and Winter Semester 2020/21".

2 Contextualisation

On the one hand, the shift to “Distance Learning” caused by COVID posed great challenges for everyone involved, while on the other hand, new ideas were tried out and experience was gained with (widely used) digital teaching, learning and eAssessment. Now, these have to be systematically considered in their diversity and a vision for the future must be developed.

This momentum of reflection is essential, because the higher education digital teaching, learning and assessment of the past year and a half has to be evaluated, and the lessons learned shall be incorporated in the best possible way for future teaching and learning processes – without the restrictions of the pandemic – thereby contributing to the further quality development of higher education teaching.

Digital elements are increasingly becoming part of everyday life in higher education teaching. Yet face-to-face teaching, where teachers and students are physically present at the same place, remains indispensable. Furthermore, questions become relevant in this context, such as:

- What priorities do the higher education institutions want to set alongside their institutional digital strategies?
- For which teaching/learning scenarios are digital formats well suited?
- When should preference be given to direct on-site communication?
- Answering these questions is key for the near future.

It should be noted

- that higher education institutions are to be understood as a place of encounter and discourse, and that they gain their special quality in direct, on-site interaction, where students encounter each other and interact with teachers;
- that personal commitment of teachers contributes significantly to good higher educational teaching both in “digital teaching” and in face-to-face teaching. This continues to mean “pathos” in addition to “ethos” – i.e. conveying enthusiasm and curiosity to learners, which also implies a willingness for teachers to try out new media and to further develop joint learning between students and teachers, including through participation in further educational events;
- that particular attention should be paid to in-depth cognitive activation of students through suitable learning scenarios and tasks when learning in the virtual space.

3 Conceptual focus

The following overview can be used for the initial conceptual focus:

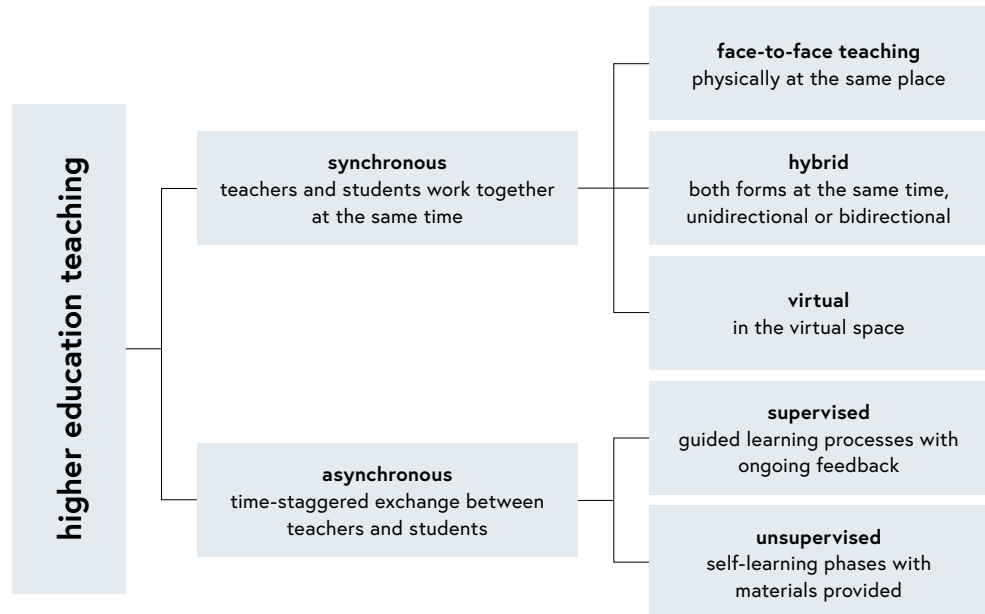


Figure 1 Conceptual focus, own chart

Explanation of the chart:

- **Synchronous teaching and learning** involves class time spent together by teachers and students in simultaneous interaction and/or communication. This can occur in different forms, e.g. as a presentation during a lecture, as joint simultaneous work in a seminar, or in the form of coaching and counselling for small groups in exercises or labs. Students and teachers actually spend this time together. Synchronous lessons (= synchronous teaching and learning) essentially correspond to contact hours (semester hours) as regulated in curricula and employment law (for teachers).
 - **Face-to-face teaching:** This refers to teaching where everyone (teachers and learners) is physically present at the same place at the same time. Of course, digital elements can be and are often integrated into “face-to-face” teaching (e.g. playing video recordings, using student response systems) or corresponding didactic interventions are made (e.g. didactic formats such as blended learning or flipped classroom).

- **Hybrid** refers to a form of teaching in which teachers/learners are partly present on site – in a physical tangible room – and at the same time teachers/learners can be connected via an online facility (e.g. video conferencing system) and can see or hear each other and in principle engage in mutual interaction.
- **Virtual** refers to a form of teaching that is held with a joint, simultaneous, virtual presence in a virtual space.
- Asynchronous teaching and learning
 - **Asynchronous teaching (teachers' perspective)** basically includes, just as with synchronous learning, the conception and planning of courses, the creation of teaching and learning materials, the preparation and follow-up of synchronous teaching, time-delayed feedback on students' questions, the creation of exercises and examination tasks as well as their correction and feedback. However, the teaching and learning materials must be designed in such a way that the knowledge can be acquired through self-study. The teachers themselves are available for questions or additional information with appropriate resources (e.g. in chats, forums etc.). The preparation of learning resources for self-study often also increases the preparation effort and the supervision of students is less rhythmical than in synchronous scenarios.
 - **Asynchronous learning (students' perspective)** includes all forms of self-study, working through teaching and learning materials, notes and literature, as well as preparing for and following up on synchronous lessons, working on exercises, preparing presentations, and exams. Up to now, asynchronous learning had a time budget of an average of up to three times more than synchronous learning, as can be seen e.g. in a course with one semester hour for two ECTS credits, which means that a total of 50 learning hours are assessed for a total of 11.25 hours of synchronous teaching.

4 Thematic fields

The following five topics were in the forefront as the Working Group drafted their recommendations: improving the quality of teaching and learning, eAssessment, changing internationalisation through digitalisation, digital literacy and the creation of suitable framework conditions.

The guiding questions were:

- What factors need to be considered in order to improve the quality of higher education teaching and learning with digital formats?
- What is the added value of digital exams and how can an appropriate examination situation be ensured for students?
- How can cooperation and forms of collaboration be established or intensified, particularly in an international context?
- How can the development/expansion of digital literacy be ensured among students and teachers?
- What framework conditions need to be considered in order to enhance the quality of higher education teaching and learning through digital teaching scenarios?

4.1 Improving the quality of teaching and learning

As described in the “Recommendations of the Austrian Higher Education Conference on Improving the Quality of Higher Education Teaching”, the design of good teaching depends in part on the goals set, as well as on the expectations of the respective observer. However, quality teaching is essentially characterised *“by the interaction and commitment of teachers and learners and the learning environment available for learners to use”*².

2 Recommendations of the Austrian Higher Education Conference on Improving the Quality of Higher Education Teaching, Vienna 2015, available at: https://www.bmbwf.gv.at/dam/jcr:ea6dfab1-0048-4c93-b625-95b6b4a206da/Bericht-der-HSK-zur-Verbesserung-der-Qualit%C3%A4t-hochschulischer-Lehre_20151.pdf, pages 11–13.

Examples of characteristics that result in quality teaching were given:

- Empathy and commitment of teachers and learners
- Appreciation of the teachers towards the students (and vice versa)
- Appreciation of the institution towards teaching and teachers
- Content that challenges and encourages
- An assessment culture that also allows teachers to ask about context; an outcome-oriented assessment culture
- Achieving study objectives
- Transparent non-bureaucratic processes in teaching and learning organisation
- Personal contact between teachers and learners
- Appropriate, functioning and complete equipping and availability of premises to meet the various requirements
- Time to engage with content, teachers, learners
- Enabling social equity

These “qualities” also apply to the use of digital methods, tools and information systems. The possibilities of different teaching and learning settings are increased when digital methods are incorporated into teaching.

Essential framework conditions to consider that enable quality particularly in the digital space:

- **Media didactics:** This means the deliberate decision to use a media teaching method and the choice of the corresponding (digital) resources. It should be remembered that the use of digital tools changes the nature and quality of face-to-face contact between teachers and learners. Considering findings in learning research is also helpful here, as it can assist in reflecting on³ teaching/learning arrangements in the digital space as well as designing and implementing them. Thereby the distinction between *visual structures* and *deep structures* is meant. The former describes all features of teaching that are easily accessible (even to outsiders) through observation, and the latter focuses on the quality of engagement with the content (i.e. the depth of processing) and social interactions. The diverse examples of good media practice for teaching purposes, e.g. relating to didactic scenarios such as blended learning, flipped classroom, the diverse uses of digital media and a sensible use of methodological small formats (digital assignment formats, etc.), can be found in the “Atlas of Good Teaching” [<https://gutelehre.at/>].

3 Cf. Kunter, M., Trautwein, U.: Psychologie des Unterrichts (Psychology of teaching), 2013, p. 65.

- **Communication:** Digital teaching in particular depends on clearly regulated **communication structures**. This includes, above all, transparently communicated rules about contact and interaction opportunities that are appropriate for the type of course and enable students to get in touch with teachers and other students (e.g. peer exchange, peer mentoring). Synchronous, time-bound communication in live sessions fulfils a different function than, for example, an asynchronous discussion forum on an online platform. There should always be the possibility of (a)synchronous communication – e.g. posts, discussion forums – as well as for short queries and personal enquiries. Concerning this, there should be rules to ensure the online socialisation of all participants (e.g. about netiquette) and their corresponding accountability. This clarifies how people interact with each other and what they expect from each other (commitment, punctuality, feedback structures, etc.), as well as the available opportunities for interaction and participation.
- **Interaction:** Digital scenarios enable cooperative and student-centred learning, also across distances. By digitally supporting cooperation and collaboration, research-based learning (for example) can be promoted by working on authentic problems or using a situation-based approach (based on researched information and acquired data) that does not depend on a specific learning environment. Digital teaching scenarios must also take into account learning as a social process, since learning in the digital space is also based on relationships. This makes it all the more important to have clear rules and guidelines for working in virtual groups in order to ensure the best possible participation by each individual.
- **Quality assurance:** Continuous further development and safeguarding of the teaching/learning process is essential for qualitative higher education teaching, which should also include the latest results of learning research and educational informatics. Existing quality assurance processes at higher education institutions integrate digital possibilities within their area of responsibilities. The discourse taking place both in specific networks (e.g. QM network of universities, ACOnet, Forum Neue Medien Austria (fnma), and across institutional boundaries and sectors can therefore promote peer learning.

4.2 eAssessment

As is the case for digital teaching, the selection of digital examination scenarios must be appropriately based on the objectives to be achieved in the course. The advantages and disadvantages of a digital exam must be weighed against each other and may vary depending on the context and the format of the exam. The advantages of a digital examination may lie not only in relative independence of location, but also in better readability or in a simplified work process. The disadvantages may lie in the technical infrastructure as well as in the lack of an adequate guarantee of authorship.

Austrian higher education institutions for some time in isolated cases have used technology-supported examination scenarios. Due to the pandemic-related shift to distance learning, these are now widely used and it is important to consider which assessment scenarios would be suitable for the future. Above all, the focus should be placed on formats that promote competence-oriented assessment.

Didactic aspects

- Competence-oriented eAssessment:** For any successful course, it is essential that learning objectives, teaching/learning methods and examination scenarios are already coordinated in the planning. The examination tasks should reflect this “constructive alignment” in terms of the structure and content of the course. The learning objectives of the course are defined and, as a result, the most suitable examination format is chosen and appropriate teaching and learning methods are then used. In this context, higher education teaching is considered from the perspective of student learning, with coherence and transparency of learning objectives and examination scenarios at the centre of considerations (see Biggs, J., Tang, C. [2011]; Wildt, J., Wildt, B. [2011]). These basic considerations apply to any assessment format.
- Diverse methods of digital assessment scenarios: Various forms of assessment scenarios, which can also be implemented digitally, are used for learning control and performance assessment at higher education institutions:

	Immanent/formative eAssessment	Summative eAssessment
	Formative assessments are used to determine learning progress and usually take place during the learning process. They provide the information needed to guide the further learning process and successfully complete it (cf. Handke, J., Schäfer, A. M. [2012]).	Summative assessments take place at the end of a learning process and are used to review and evaluate the learning progress or learning success (cf. Handke, J., Schäfer, A. M. [2012]). They are the most common type of assessment in higher education practice.
oral	e.g. oral project presentations	e.g. oral course examinations via video conferencing systems
in writing	e.g. exercises, tasks, quizzes, forums, wikis, uploads of text/audio and video documents, theses, homework, project work, written mid-term exams, work assignments, e-portfolio	e.g. open-book examinations, take-home examinations, online examinations or tests/“computer-assisted on-site examinations”

Figure 2 Differentiation and examples of digital assessment scenarios, own representation

Examples for summative digital assessment scenarios:

- **Oral examinations:** These are conducted in web or video conferencing systems. This form of assessment has, in retrospect, worked well in the past few semesters following the outbreak of the COVID pandemic and may continue to be used in the future (e.g. for students who are unable to attend an examination on-site for a particular reason, such as care responsibilities).
- **Open book examination:** Resources are permitted during the (online) processing of the tasks, e.g. scripts, as well as internet access if applicable. Open book examinations have been used more often because of the shift to distance learning caused by the pandemic and many teachers have gone over to these. The rather complex questions encourage interconnected thinking, but are as much a challenge for teachers as for students in terms of preparation and evaluation. In any case, from the students' point of view, it must be noted that the questions are becoming more complex and clarity and solvability need to be considered to an adequate extent.
- **Take-home exams:** This is a written asynchronous examination in which students complete tasks within a certain predetermined longer time frame before submitting them online (e.g. as a scan via upload). This format has many similarities with open book examinations.
- **Online assessments or tests:** These are done by the students directly at the computer and online. The examination takes place for all students at the same time (synchronously) and has a very tight time frame. Here, assessment scenarios are increasingly used that rely on the traditional possibilities of computer examinations (e.g. multiple-choice, single-choice questions, etc.), which are presented in different selections. Special programmes are also sometimes used (assessment software) that are designed precisely for this type of assessment. This assessment scenario is closely associated with the question of online supervision.
- **Project work:** These are projects to be worked on independently with a clearly communicated deadline over a longer period of time (e.g. semester) and which are used for performance assessment.

Technical aspects

- **Technical equipment:** Technical equipment must be available and operative. Appropriate terminal device and a stable internet connection are minimum requirements. In addition, the operating system must be kept up to date, in particular the web browser. If online supervision is also required, a webcam and a headset are needed, or possibly two terminals. Local installation or browser adjustments may be necessary if using special software. Students and teachers should be made aware of this in good time. On the part of the higher education institutions, the technical systems must be able to cope with this (be resilient) and be available to all students across the board. In any case, guarantees are required in the run-up to examinations that technical framework conditions are in place both on the part of the higher education institution and on the part of the students.
- **Place of examination:** Care should be taken to ensure that students are able to create an undisturbed examination environment in their personal living environment. In principle, locations or rooms for e-assessments should be provided at the higher education institutions in order to be able to offer students the possibility of digital examinations on site in the event of a lack of equipment.
- **Technical questions / support:** For questions and problems, technical support should be available before and during a digital written examination. Ideally, it should be able to reach via a channel other than the internet (e.g. telephone hotline).
- **Quality assurance:** In any case, it is recommended that mock examinations are available to students. This allows them to prepare for the examination environment and to build confidence. In the case of written assignments, the possibility of plagiarism checks must also be provided.

Legal framework: What should be considered?

- In any case, the identity of the students has to be verified in an appropriate manner before the examination.
- Binding legal framework conditions, institutional standards and key aspects of study law, in particular data protection provisions and provisions in the area of privacy and copyright, must be appropriately taken into account in the respective higher education institution, recorded in parts of the statutes and continuously developed. In any case, students must have the opportunity to understand the relevant legal framework conditions (e.g. data protection) before taking an online examination so they can give their consent in the event of an examination. It is recommended to combine this with online mock examinations.

- **Fairness and academic integrity** are important principles in holding examinations. The examination conditions (both in terms of space and examination situation) must be designed accordingly.
- The **possibility of checking the independence of the examination performance** (i.e. the ability to answer questions or set tasks or problems independently of outside help or with the defined permitted resources) using the knowledge and skills acquired in a course must also be ensured in the digital space.
- **Accessibility for all must be ensured**, i.e. disabilities, impairments, chronic illnesses, etc. must be taken into account in any case when selecting suitable examination scenarios.

Organisational aspects

- For high-quality implementation of digital assessment scenarios there is a need for corresponding further **training opportunities for teachers**, which on the one hand contribute to the continuous further development of examination didactics, technology (software, hardware) and quality (related to the content of the examination) and also include peer offers.
- **Timely and transparent information and communication** on the part of teachers and higher education institutions is central to these examination scenarios. It is essential that teachers and students familiarise themselves with the technical and procedural elements of the examination setting before the examination is held. This can be achieved e.g. through mock examinations, in order to minimise the psychological burden on the students. To this end, more digital examinations could be offered in the corresponding rooms at the local higher education institutions in the future.
- Furthermore, principles of **accessibility** (related to the examination situation) as well as the social situation of the students (e.g. the possibility of borrowing equipment, funds from the hardship fund, etc.) would have to be taken into account in any case for fair and equal implementation of digital assessment scenarios.

4.3 Internationalisation through digitalisation

The extensive shift of higher education teaching to digital teaching and learning methods in the course of the COVID pandemic will have a lasting impact on the internationalisation strategies of Austrian higher education institutions. For example, in a survey conducted by the German Academic Exchange Service (DAAD) in Germany, a quarter of the institutions surveyed said they had entered into new, virtual collaborations with higher education institutions abroad to enable students to participate digitally in their

courses.⁴ The EU's Erasmus+ programme is also responding to the paradigm shift by requiring the implementation of minimum requirements for the digital management of mobility and by supporting digital learning and exchange formats with the promotion of "Blended Mobility" and "Blended Intensive Programs" (see also Higher Education Mobility and Internationalisation Strategy 2020–2030 [HMIS 2030]). The new flexibility gained through online formats with regard to the use and international exchange of digital course offerings (held in English) as well as entire study programmes opens up new perspectives for more intensive networking of Austrian higher education institutions with European and international partner institutions as well as cooperation between academic and non-academic staff. In addition, individual contributions by international experts can be easily and efficiently integrated into local events through digital formats, and therefore e.g. used as a course highlight.

Digital elements can support the successful internationalisation of higher education teaching, but cannot completely replace it. Among other things, the integration of international students and mobile teachers in the host country, personal experiences with other cultures and long-term international networking are shaped by the physical mobility of individuals. Last but not least, the importance of international graduates for the country's capacity for development and innovation must also be taken into account.

Basically, the aim here is to gather experience in the medium term, analyse it and consolidate it as necessary.

4.4 Digital literacy

From the students' point of view

Students' digital skills are the foundation of a successful implementation of digital teaching. At the same time, these skills are a prerequisite for empowered citizens in the age of web culture and are not limited to application skills, but must be embedded more broadly in the context of skills (see debate on digital skills or 21st century skills, e.g. Van Laar et al. [2017]). Accordingly, the term digital literacy must be used comprehensively. A distinction is made between

- general digital literacy ("How do I use it?") and
- in-depth informatics skills ("How do I implement it?").

It is therefore definitely a task of higher education institutions to stimulate critical thinking and consideration in the area of digital action when dealing with media (Janschitz et al. [2021], p. 122).

4 https://static.daad.de/media/daad_de/der-daad/kommunikation-publikationen/presse/corona_ap_final_dt.pdf, page 5 (access on 12 Oct. 21)

New students consistently rate their digital skills as high and also have a positive attitude towards digitisation. They generally have experience in using digital devices, but skills development at school is not structured, and students acquire much of this in a private context (see Janschitz et al. [2021] – DIKOS study).

Although teaching in the virtual space also promotes students' digital literacy, structured competence building should already take place before the start of their higher education studies. This would allow higher education institutions to provide offers for students to catch up on any skills and abilities they lack in working with digital media at the beginning of their studies. These should be differentiated offers according to the specific needs of the respective degree programme. In addition to digital skills in the narrower sense, however, the deficits identified in the distance learning phase, such as the ability to work independently and adopt an organised approach, should also receive increased attention when designing educational processes (Tengler et al. [2020]).

From the teachers' point of view

Digital skills for teachers are an important prerequisite for the successful implementation of digital teaching. Further development of teachers' digital literacy is an essential component in the digitisation of higher education institutions. It is only through the acquisition of skills in the use of digital formats as well as consideration of these that the possibilities of digital media open up. Thus, new modified forms of teaching and learning can be experienced and established. This results in adapted scenarios for examinations, which changes the study programme as such.

Digital skills form part of the 21st Century Skills model, which covers four areas of skills⁵:

- Skilled use of media, technologies, information and data
- Virtual and face-to-face communication and collaboration against the background of diversity (e.g. interdisciplinarity, interculturality, age)
- Creative problem solving, innovative ability, analytical and critical thinking
- Flexibility, ambiguity tolerance, self-motivation, independent work

The skills that can be expected from teachers in higher education are therefore diverse and go beyond pure application knowledge. There are very individual requirements that appear depending on the degree programmes and the area of responsibility. Exchange between teachers on working with digital media in their discipline, on e-tutor systems, micro-training, etc. should therefore be promoted. Comprehensive qualification and further training measures and social learning should be expanded in this area at the respective higher education location, e.g. by providing information and examples of good

5 See <https://hochschulforumdigitalisierung.de/de/blog/kompetenzen-21st-century-skills> (30 September 2021).

practice as well as regular qualification offers for all teachers at higher education institutions. Yet initiatives across multiple higher education institutions are also necessary: existing projects should be further promoted and expanded.

4.5 Creating appropriate framework conditions

Technical infrastructure from the institution's point of view

In order to implement digital teaching at a higher education institution, basic equipment is generally necessary, from basic infrastructure to web-based information systems and applications on a mostly in-house server landscape. A study on educational technology (Bratengeyer et al. [2016]) had already shown that most higher education institutions utilize learning management systems, video conferencing systems or even video platforms today. During the COVID-19 pandemic, higher education institutions were able to draw on some pre-existing structures, but report the necessity of massive expansion to meet the significant increase in demands (Ebner et al [2020]). Other studies⁶ report that students demand central and uniform systems, as they are confronted with different applications and accesses from course to course, even within the same higher education institution. This is also a clear challenge for teachers across different institutions.

Moreover, each additional application also brings its own questions of compliance with data protection and copyright rules. In summary, it is stated that the basic infrastructure should rely on standards, ideally on open source solutions. The basic equipment for all institutions should include adequate coverage of internet access (including sufficient bandwidth and comprehensive power supply across the board; this is mentioned here for the sake of completeness), so that digital working is possible for everyone. In any case, Austria-wide networks such as the Austrian Academic Computer Network (ACOnet) or the Forum Neue Medien Austria (fnma) must be welcomed in order to initiate Austria-wide and inter-institutional exchange and joint developments.

Technical infrastructure from the teachers' point of view

Building on basic infrastructure as well as central information systems and by respecting media didactic aspects, teachers can design and deliver teaching with high quality. In order to implement this, they need above all appropriate terminal devices such as tablets with pen input, video conferencing systems in seminar rooms, digital whiteboards, document cameras, etc. Consideration should be given here as to how and to what extent a higher education institution would like to make these possibilities reasonably available.

⁶ Pausits, A., Oppl, S., Schön, S., Fellner, M., Campbell, D. F. J., Dobiasch, M. (2021). Distance learning at Austrian universities and higher education institutions in the summer semester 2020 and winter semester 2020/21. Vienna: Federal Ministry of Education, Science and Research, URL: https://pubshop.bmbwf.gv.at/index.php?article_id=9&type=-neuerscheinungen&pub=926

Possible solutions seem to be loan pools, shared devices and focussed acquisition of equipment. Additional tools, e.g. to increase interaction, may be necessary to support a particular didactic intervention. The equipment provided must have sufficient processor capacity to guarantee smooth and flawless teaching. Considering the data protection and copyright regulations, the issue of the extent to which campus licences and their acquisition are of interest here should also be examined.

Finally, in addition to the technical equipment, it is recommended that teachers have sufficient support available to answer technical and application-oriented questions promptly and in a timely manner. In addition, it must be ensured that digital teaching is also designed to be accessible to all, which places another requirement on teaching skills and on technical equipment.

Technical infrastructure from the students' point of view

Students themselves must also have the appropriate basic technical equipment in order to be able to meet the requirements of digital teaching. For instance, sufficiently fast internet connections, laptops/PCs with minimum standards to be defined, webcams, microphones and loudspeakers are indispensable for distance learning. The institution has to communicate minimum technical requirements clearly and in good time and, above all, appropriate support should be established to assist students promptly with technical challenges of any kind. In particular, it must be emphasised that due to such technical standards, socially disadvantaged groups have to be supported as far as possible in order to prevent exclusion from access to education due to the additional technical barriers. Possible solutions here as well include loan pools, support funds, special offers, etc. The financial basis for this should also be made available.

Places of learning

The increasing digitisation of higher education institutions and the associated ongoing switches in teaching and learning settings between physical and virtual locations place additional demands on higher education. Digital teaching and learning also enable location-independent scenarios. This means that teachers and students can implement these in different locations, such as on campus as well as at home.

In any case, it must be ensured that the higher education institution fulfils its role as an enabler and therefore provides, wherever possible, facilities on campus where one can participate in digitally taught lectures or digital examinations can be held. The higher education institution therefore has the task of creating places where students can fulfil their academic obligations without hindrance. Low-threshold access to support, study and examination rooms, accompanied by broad communication of appropriate support services, is necessary in any case to compensate for social disadvantages and to ensure the best possible studyability.

Data protection and copyright

Consideration of the legal framework conditions is essential in the area of technical infrastructure, especially concerning data protection and copyright. In times of increasing data processing and corresponding applications, such as learning analytics apps, it is imperative to handle fundamental rights and the data of students and teachers with care (Leitner et al, 2019). Data processing measures should be communicated transparently, taking into account the current legal situation, and ethical aspects should be considered as well.

The restrictive copyright protection for textbooks continues to be an insurmountable (financial) hurdle for most higher education institutions. On the one hand, the recommendation therefore is to focus much more strongly than before on the production of Open Educational Resources (OER) and to join Austria-wide efforts here, such as the “Open Education Austria Advanced” project [<https://www.openeducation.at>]. On the other hand, efforts to make copyright more education-friendly should also be intensified. Accessibility to digital educational content must be considered a key factor for a future knowledge society (Ebner et al, 2016).

Social aspects

Networking despite physical distance (students with each other, with teachers, teachers with each other) is easier in the virtual space. However, this networking has a different quality (generally considered poor or insufficient), since interaction (according to the experience of the last year and a half) in the virtual space cannot replace either socialisation at the higher education institution or the direct contacts.

In addition, access to technology, equipment and space to enable e-learning can also vary widely and often includes barriers (such as a lack of a supportive learning culture or a quiet retreat space, an unstable or weak internet connection).

“Digital equity” in higher education refers to the increasing digitisation in higher education teaching which can both promote and prevent equal opportunities between students. The role for higher education institutions here is to focus on equal opportunities, diversity and inclusion. The government’s role, and therefore that of the Ministry of Science, is to provide a sufficient financial basis for an equal-opportunity education system.

4.6 Conclusion (on the potential of digital teaching scenarios)

Digital teaching scenarios can be used and applied in a meaningful way in various degree programmes in different phases of study. The format and content of digital teaching should be suitable for the respective **setting** (3 target formula: target group, goal and time budget) or be adapted appropriately; it should never simply be a basically unchanged substitute for face-to-face teaching. In particular, it is important to adapt the synchronous and asynchronous elements of the virtual space to the situation and the skills of the teachers and learners involved and to adapt the diversity in use and/or design of teaching materials (explanatory videos, screencasts, etc.) to the different contexts of reception.

The decision to use specific synchronous and/or asynchronous elements should take into account the progression of the learning process and the respective study progress. While **asynchronous content** (e.g. discussed lecture slides, etc.) offers the advantage that each learner can work on the content at their own pace and at an individually appropriate time and, if desired, also repeat this, **synchronous elements** can be used for discursive processes in knowledge acquisition and for the concrete processing of application cases, e.g. in practice situations. In the process, diverse perspectives, bodies of knowledge, and advances in understanding can be presented, reflected upon, and thought about further.

The advantages and disadvantages in the virtual space cannot be identified in general, but always only with reference to the particular course. We must also point out a kind of “**method illusion**”, i.e. **the idea that with the right digital method we have found a kind of didactic “philosopher’s stone”**. Yet the choice of didactic method is by no means arbitrary. It must be made with a view to the intended learning actions, social interactions, etc. In principle, different didactic methods can be used to create a setting that is effective for learning. Also with regard to the effect of face-to-face and distance learning offers (with the use of digital media) no significant differences are found: “A good didactic preparation of the learning content is therefore more important than the quality of the media implementation, which in turn is more important than the question of whether it is virtual or on-site teaching.”(Schneider; M., Mustafic, [2015], p. 26).

Guidelines for the selection of digital teaching scenarios:

- **Methodological diversity:** Digital teaching scenarios generally enrich the teaching/learning processes and can contribute to methodological diversity, especially in the respective degree programme. This also addresses different learning preferences.
- **Variety of different perspectives:** Students are given the opportunity to perceive and reflect on diverse standpoints and different experiences. Examples: Different ways of thinking and acting become visible
 - on the internet (digital research),
 - the way students perceive solutions to tasks of colleagues (digital “Think – Pair – Share”) or
 - in the feedback they receive about their own draft solutions and their thoughts (digital chats, forums).

The **importance of understanding** in the digital context should be pointed out in this context. Teachers in academia almost unanimously expect students to not only reproduce facts, but also to understand them. “Understanding” here means perceiving a fact in such a way that the new concept fits coherently into existing knowledge. If understanding is successful, then learners can comprehend facts on their own and also incorporate them when discussing other people’s attempts at interpretation. This active construction process creates links between what is already known and what is new and therefore builds on the individual patterns of interpretation of the person concerned. The following are important in the digital space:

- **Cognitive empathy:** Teachers need to try and understand the students in order to have the suitable approaches, explanations and questions available. This is particularly important in the digital space as communicating on an ad hoc basis tends to be more difficult.
- **Higher-order thinking:** Deep, understanding-oriented learning can happen through reflective work when cases are handled by students. Example: mutual presentation and argumentation of possible solutions in breakout sessions.

5 Recommendations

An essential requirement for good teaching is having committed and emphatic teachers and students. Higher education involves interaction between teachers and students, interaction between students and socialisation through the experienced “higher education” environment. In this sense, digital scenarios should be implemented in such a way that they widen the possibilities of good higher education teaching and enrich the acquisition of skills.

With the following policy recommendations, the Working Group identifies essential key aspects for future digital teaching, learning, and assessment, incorporating both individual and institutional experiences as well as lessons learned and evidence from past semesters. Continuous further development of the required skills (e.g. digital literacy) is essential in the sense of a circular understanding of quality in higher education.

Based on the empirical values of the last year and a half, it has now become possible to make a better assessment of the advantages and disadvantages of meaningful digital teaching. This resulted in the following recommendations.

5.1 Recommendations for teachers

Reflect on and strengthen own digital teaching practice: Digital teaching is more than just transferring the previous format into the digital medium. It requires a different didactic conception. Raising understanding of digital formats and making the right choices from the “digital repertoire” also calls for a redistribution of the workload and corresponding feedback structures (timely feedback depending on the type of course and group size) with regard to the planning effort and the planning process for digital scenarios.

Encourage social interaction: Higher education institutions shall be perceived as places of social interaction between teachers and students and among students. Lively and quality communication requires synchronous interaction and benefits from spatial proximity.

Use of a few selected tools or features: Focus on a few proven tools or features that can be used confidently and competently (e.g. breakout rooms, etc.), taking into consideration data protection and copyright regulations. In this context, the use of freely accessible teaching and learning materials for sharing content should be considered, especially Open Educational Resources (OER).

Establish clear and timely communication structures: Information about the courses must be published on appropriate online platforms in a timely and transparent manner, stating all requirements. This should also include information about the planned and used feedback structures and offers according to the respective group size. Care should also be taken to ensure that the teaching/learning requirements are formulated in a comprehensible way so that no additional explanation is necessary. This requires clear formulations on the part of the teachers.

Take advantage of further training opportunities: The following higher education didactic topics may be useful for working with digital teaching/learning scenarios: constructive alignment, skills orientation and possible implementation using concrete applications, teaching and learning process design (process-oriented), media for teaching purposes in order to get to know and test suitable and new didactic options, as well as dealing with large amounts of material in the digital space.

Expand (competence-oriented) assessment: The portfolio of examination scenarios can be expanded to include digital options, although it is important to make the right selection with regard to the objectives of the course and to proceed by following a clear coordination of objectives, learning or examination tasks and teaching activities (in the sense of constructive alignment), also taking accessibility and social diversity into consideration.

The opportunities offered by digital examination scenarios should be used in such a way that competence-oriented assessment (e.g. problem solving, applications, independent reflection) are encouraged. This also includes dealing with the diversity of (digital) examination scenarios and answering the following question in the process: Which examinations are implemented via analogue methods and which are done online? Depending on the subject and the degree programme (BA, MA, PhD), the relevant assessment scenario must be selected and adequately used to test the skills to be achieved in the specific programme. This goes hand in hand with the issue of which students' skills should be tested.

Implementing examination supervision poses a challenge when mass written examinations take place remotely. It has become apparent that efforts to prevent the use of unauthorised aids can lead to excessive control checks or inappropriate complications and consequently add to the students' stress. This must be prevented as far as possible, e.g. by retaining examination scenarios that are held locally at the higher education institution. The right of students to accessibility must still always be taken into consideration.

Provide information on digital assessment scenarios in good time: The best possible information and transparency must be provided both at the beginning of the course and while it is going on, because the students' need for information and communication also increases with the variety and complexity of the examination scenarios. A transparent presentation of the procedures and framework conditions of the software used, the type and number of examination tasks there will be, the assessment scheme as well as the requirements of the examination must be laid down at the beginning of the course.

It has proven useful to offer mock examinations when new digital assessment scenarios are introduced in order to clarify any questions the students may have. This way, both students and teachers can familiarise themselves with the digital examination scenarios and software. This should also be taught in higher education didactics training.

Demonstrate academic integrity and fairness with transparency: Teachers must stipulate which resources are allowed and which are not. In line with the point "Information on digital examination scenarios", clear information on the basics of academic integrity and fairness as well as an explanation of possible sanctions if these are disregarded must also be provided in good time before the student's course performance is recorded. The underlying question must be answered: How do I ensure that integrity is maintained and fairness preserved for all students taking the exam?

Take advantage of opportunities to strengthen internationalisation: By using the digital options available, it is relatively easy to invite individual experts as guests to the course, and this can encourage current academic discourse. The National Mobility and Internationalisation Strategy for Higher Education (HMIS) 2030 aims to ensure the development and implementation of virtual concepts for cross-border cooperation in higher education teaching, the development and testing of mixed forms of physical and virtual mobility as well as the creation of new formats of international cooperation. Virtual international study programmes should also be regularly evaluated once they have been established and/or expanded.

5.2 Recommendations for students

Keep yourself well-organised and take on personal responsibility: For conscious semester planning, it is essential to be informed in good time of the specific arrangements of how the course will be held (face-to-face, hybrid or virtual). Students should organise their own learning units and study periods according to the timing specified for the synchronous and asynchronous teaching units. This allows learning assignments to be completed in the allotted time and it also enables the students to prepare for an examination (or a learning assessment) in the best possible way. It is the students'

responsibility to make sure that they have the necessary equipment (e.g. hardware and installation of software) in good time.

Access information and use the service facilities: Higher education institutions expect students to be proactive in using the official communication channels offered by the higher education institution and teachers. It is also noted that the responsible support institutions should be utilised at the higher education institutions (e.g. IT services for infrastructure, teachers for content-related questions, e-learning staff units).

Put fairness and academic integrity into practice: Higher education institutions expect students to commit to and put academic integrity into practice. Students should be aware of this expectation and develop an active commitment to upholding it. This is also carried out in a spirit of fairness towards fellow students. Mock examinations should be taken in order so students can familiarise themselves with the exam environment and the organisational conditions. As part of preparations for an examination (especially for distance exams), students must ensure they have a suitable environment to study in, such as a quiet space for concentrated work, and the proper technical requirements.

Take advantage of the additional possibilities for internationalisation: Physical mobility should continue to be a common principle for internationalised study programmes while minimising social disadvantages. The COVID-19 pandemic has clearly demonstrated what happens when there is a lack of integration of exchange students in the host country, a lack of personal experience and a lack of long-term international networking. Opportunities for (even short-term) additional internationalisation through virtual visits to other higher education institutions should also be taken advantage of, including e.g. within the framework of the Erasmus+ programme, likewise blended mobility programmes.

5.3 Recommendations for the institutions and higher education administration

5.3.1 Strategic considerations and educational goals

Embedding digital teaching in an overall teaching strategy: It is recommended that digital teaching, learning, and assessment be embedded in an overall teaching strategy for all higher education institutions, in coordination with a digitisation policy that is jointly supported by all top-level bodies. Public universities and university colleges of teacher education are already required to develop institutional digitisation strategies. Linking teaching/learning and digitisation strategies together should be considered in terms of quality assurance. Higher education institutions should allow students to participate in the process of further developing teaching formats, establish student contact persons and thereby encourage campus digitisation.

Commitment to quality improvement: A clear public commitment on the part of the higher education institutions is recommended, stating that the addition of digital teaching and learning formats serves to improve the quality of studies and teaching rather than to save resources. For example, teachers have more time for direct interaction within a course if students have already acquired the essential content through self-study using recorded lecture content.

Enshrine strategic educational goals: Although some of them are “digital natives”, students still have to be supported in their development towards becoming “digital savvies”, i.e. the transition from a playful-casual approach to an in-depth understanding of the handling and considered use of digital media.

Maintain academic and teaching freedom: Curricula regulate course types, contact hours (“semester hours”) and learning hours (ECTS credits) as well as learning outcomes. All other aspects of digital teaching should continue to be shaped as far as possible by the teachers themselves within the framework of academic and teaching freedom. This also applies to the use and selection of digital media. However, like teaching in general, these are subject to ongoing quality control by the higher education management and the students.

5.3.2 Communication and exchange

Maintain a balance between digital and face-to-face teaching: In future, the challenge will be to identify new approaches for optimal use of the various forms of interaction and communication for study and teaching purposes. This requires a broad discussion – as it concerns the quality of (social) interaction – taking into consideration the portfolio of possibilities that has now expanded significantly.

Consider different requirements: Take into account transitions between digital and face-to-face teaching in course and semester plans. The short-term switch from the physical space (lecture hall, laboratory) to a digital space is much more difficult for students when they are present on the higher education premises than for lecturers, as students do not have personal workspaces with the corresponding technical equipment.

Ensure timely, sufficient and clear communication: Students must be informed sufficiently and in good time about possible minimum requirements for online classes. Appropriate offers must be established in any case for socially disadvantaged groups – with the support of the Ministry of Science. This requires a clear division of responsibilities between content teaching and technical support/technical infrastructure, which must be communicated to everyone involved.

Support peer exchange for teachers: The aim is to enable teachers to exchange their experiences with digital teaching, learning and assessment and to support them in this process.

Offer support for students: The higher education institutions should place a special focus on whether the communication channels between students and with teachers have proven successful and in which areas there is a need for further development and support (e.g. support with organisation skills).

5.3.3 Framework conditions for teaching

Consider the volume of work required for digital teaching: It is recommended to clarify the hourly mix the individual course types are composed of as a model at the respective higher education institution: Contact hours as synchronous teaching of teachers and learners, working hours of teachers for asynchronous teaching and self-study by students for asynchronous learning. Real hourly volumes of work for the teachers and the ECTS performance of the students must be evaluated regularly with this (see also the Forum Neue Medien Austria (fnma) white paper “Quantification of virtual teaching at Austrian higher education institutions”).

Provide proactive support to teachers: Teachers are to be supported in particular with copyright issues, negotiation of framework licence agreements for the use of third-party digital teaching materials and also through further training in the area of Open Educational Resources (to strengthen their use and creation). A modern copyright law also has to take aspects of teaching adequately into account and, if possible, is to be negotiated beyond Austria’s borders (e.g. textbooks and licence agreements).

Strengthen students as confident digital users: Corresponding offers should be created at higher education institutions in order to support the development of students’ digital skills at the beginning of their degrees. E-tutor systems, micro-training and further training opportunities on digital work are examples of some of the initiatives that should be set up or expanded for this (including in the form of online courses).

Enable media-didactic further training opportunities for teachers: The importance and further development of higher education didactics is one of the central tasks in higher education development. Ensuring a tighter interlock with media for teaching purposes and educational informatics is just as important as, in particular, the holistic further development of higher education didactics. Digital skills should be included in the employment requirements where this is appropriate or required professionally. This requires specific and structured further training opportunities for teachers that are enshrined within appropriate personnel development measures and courses in higher education didactics, including for new higher education teachers.

5.3.4 eAssessment

Choose examination scenarios carefully: It is crucial to make sure the entire higher education institution is aware of, and understands, the range of different examination scenarios and their various areas of use. The framework conditions must be clearly communicated to everyone, and there are contact points such as the Austrian Students' Union, ombudsmen, clearing offices, etc. for problems and objections. The technically controlled monitoring of examinations (e.g. online proctoring) must be considered, evaluated and checked for its future viability on the basis of the (still very rudimentary) experiences of previous semesters. It is useful to coordinate this across Austria and to make the process transparent.

Ensure fairness and academic integrity: Fairness and academic integrity must still be ensured despite the various new examination scenarios. To this end, a broad discussion must be held on which instruments and support measures are particularly suitable for this purpose. The potentials and limits of online proctoring within and beyond the institutions must be addressed and discussed in this context in order to raise awareness of a possible "technical surveillance spiral". Open legal issues should be identified with legal expertise obtained as necessary. There is also a need for clear legal regulations on what to do if technical failures etc. occur during online examinations through no fault of the student, and how to ensure appropriate legal protection for students.

Encourage peer learning: It is recommended to make peer learning and the visualisation of good practices within the higher education institution known to all members of the institution, particularly with respect to digital assessments.

Ensure appropriate infrastructural framework conditions: Established technical structures must be further developed in view of the necessary requirements. The use of digital media must be planned and coordinated with other uses of infrastructure (e.g. computer rooms, server and network capacities, software licences, etc.). In any case, attention must be paid to data protection and licensing aspects. Higher education administrations must ensure that the planned use of digital media in teaching corresponds with the work equipment and network access available to teachers and students. This also includes a pool of appropriate IT equipment and workstations that can be offered to students for temporary use as required.

Carefully select and communicate assessment software: Students and teachers (including external teachers) must be informed about which software is available at the individual higher education institution, including the licences. This requires sustainable infrastructures that allow the necessary documents and materials to be retrieved, transferred and reused in the long term (offer of archiving, taking data protection into consideration). These must have the flexibility required for different thematic areas.

5.3.5 Internationalisation based on the opportunities offered by digitalisation

Intensify the process of European and international networking: The development of new high-quality virtual mobility formats as well as mixed forms of physical and virtual mobility (blended mobility concepts) should be encouraged and offered for all groups of higher education staff. This promotes digital communication skills, teamwork, creativity and foreign language skills (see also Goal 3, National Mobility and Internationalisation Strategy for Higher Education, 2020–2030).

Continue to enable physical mobility in any case: Mobility windows within the framework of internationalised degree programmes as well as mobility support for all higher education staff should continue to be provided in any case in order to enable the acquisition of international and intercultural skills.

Adapt and expand infrastructure: To be equipped for innovative digital mobility scenarios, it is necessary to ensure adequate technical equipment, especially for hybrid learning scenarios: e.g. through on-site learning areas at the higher education institutions. Online courses should be used as another option, e.g. for training courses.

5.4 Recommendations for the Austrian Federal Ministry of Education, Science and Research

Encourage institutional exchange: The Federal Ministry of Education, Science and Research should encourage exchange on good practices/minimum standards for successful online teaching among higher education institutions and provide an appropriate framework to build on sustainable skills (a lot is happening at the different institutions at the moment) and use existing networks for this.

Enable exchanges on the topic of “digital examinations”: Opportunities would continue to be provided to engage in systematic exchanges on eAssessment in the future. The focus could be on the question of which digital possibilities of performance assessment may become regular features in the future. An Austria-wide exchange should be encouraged, particularly on authenticity and assessment scenarios with a focus on integrity and fairness.

Provision of appropriate framework conditions: Appropriate legal framework conditions should be provided (taking into account the various types of higher education institutions as necessary) that enable the implementation of didactically high-quality digital teaching and ensure the future maintenance of the social aspects of a degree programme. The aim of the ministerial activities should be to ensure that the greatest possible legal certainty is provided for all those involved. This includes regulations for

contact hours, copyright of materials, support for Open Educational Resources, remuneration structures, ensuring general procedures for credit or accreditation, etc. At the same time, over-regulation should be avoided.

It would be necessary to **ensure the funding** of the measures required for an **equal-opportunity education system**, such as additional courses, assistance funds, support money for technical equipment for students, etc. in accordance with the budget in place.

5.5 Further policy recommendations for the higher education system

This chapter contains recommendations that require collaboration from multiple actors

Austria-wide conception and cooperation across all higher education institutions:

Coordinated and mutually compatible teaching and learning systems should be used in higher education as far as possible, with preference being given to the use of open source systems where appropriate. Open licensing should be provided and recommended wherever possible (Open Educational Resources – OER) when creating teaching and learning materials. A corresponding OER policy or OER certification of the higher education institution is recommended in any case. From the project “Open Education Austria Advanced”, the OER repositories of the universities must be equipped in such a way that enables ubiquitous access to all content via a single platform. Teachers should be encouraged to share content as well and to provide it with appropriate Creative Commons (CC) licences. At the same time, efforts must be intensified to make copyright more education-friendly. Austria-wide networks, such as ACOnet, Forum Neue Medien Austria (fnma), etc. should be strengthened so that there is a lively exchange and the greatest possible cooperation between the higher education institutions. Likewise, cooperation between higher education institutions in terms of content (such as the iMooX platform or eInformatics) should be intensified further in any case.

The exchange of teachers on working with digital media in the subject disciplines must be promoted. Initiatives or peer groups across multiple higher education institutions for further training opportunities on this should be encouraged.

Ensure exchanges on the future viability of digital examination scenarios:

It is important to ensure discursive development of a new approach to eAssessment and to address the issue of the assessment scenarios for which digital examinations are actually suitable. This should be initiated promptly both internally within the higher education institution and across all higher education institutions and sectors.

Consider the entire educational career: Structured digital building of skills must already be ensured before the start of studies, i.e. at schools even before the Austrian A-level. This could be supplemented with bridging offers (e.g. bridge courses) when starting at the higher education institution. As always, however, successful study requires mastery of basic cultural techniques.

Take into account changing requirements for places of learning as appropriate: The task here is to develop and implement sustainable concepts for the future. This refers to the planning of future higher education buildings and infrastructure, taking into consideration digitisation, areas for recording courses as well as synchronous virtual teaching, computer halls, “cubicles” (in the sense of retreat rooms) for students to study and work, etc.

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