



Background paper POWERHEAD

**European project
POWERHEAD**



The background paper serves as the starting point of the POWERHEAD project, entitled 'Empowering Higher Education in Adopting Digital Learning' .

The project is coordinated by the Flemish Department of Education and Training, and is implemented in cooperation with the Flemish Education Council and the Ministry of Education and Science in Latvia.

This background paper is the result of the work of a Flemish working group and has been further enriched during a 'transnational steering group meeting'.

- The working group 'Digitalisation in higher education: steering group POWERHEAD', cochaired by Cis Van Den Bogaert and Isabelle De Ridder, prepared the background paper during 3 meetings, on 12 February 2021, 26 February 2021 and 12 March 2021.
- The background paper has been presented and discussed at the 'transnational steering group meeting' of the POWERHEAD-project on 31 March 2021.

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1 Context

1.1 Original objectives of the project ('project proposal')

The POWERHEAD project (Empowering Higher Education in Adopting Digital Learning) is a European project, with the aim of exchanging knowledge and good practices between countries that have implemented digital learning in different ways.

The central **questions** of the POWERHEAD project are:

- How can national governments support higher education institutions in the field of digital learning, given the autonomy they have?
- How can digital learning be stimulated in higher education?

The **objective** of the project is to design guidelines for a policy on digital learning in higher education at two levels: guidelines for a national policy on digital learning in higher education and recommendations for higher education institutions.

1.2 Impact of the current context on the objectives

Before the Covid-19 pandemic, initiatives on digital learning in higher education were often fragmented. As a result of the Covid-19 pandemic, higher education institutions have been forced to rapidly implement digital education on a large scale.

Even today, there are still many questions among actors in higher education. The most important open question is what higher education will look like in the long term (post-Covid-19). A policy on digitalisation post-Covid-19 can bring some peace of mind. To shape this policy, we can draw on today's experiences and learn lessons about the long-term use of technology in higher education.

The proposed **objectives** of the project remain relevant: designing a structural policy on digital learning in higher education at two levels: guidelines for a national policy and recommendations for higher education institutions. Taking into account today's context, the project can answer the following **questions**:

- Given today's context, what do institutions need from the government to develop a digitalisation policy?
- Given today's context, how can institutions further shape their digitalisation policy?

1.3 Objectives of this background paper

This background paper is part of 'work package 3'. Its **purpose** is to:

- Outline the current context of digitalisation in higher education;
- Give an overview of existing insights on digitalisation in higher education.

This will allow us in a next step to formulate more sharply **the original objectives and central questions** of the project, taking into account the current context, and to look ahead to the 'needs analysis' (see section 5).

2 Recent policy documents on digitalisation in higher education

2.1 Recent policy documents in the European context

- General policy documents referring to digitalisation in higher education:
 - [European Digital Strategy](#): This website presents the digital strategy of Europe. The strategy covers different policy fields, including education.
 - [Skills Agenda](#): This is a five-year plan of the European Commission to help individuals and businesses develop more and better skills. The plan includes a benchmark related to digital skills: 70 % of adults must have at least basic digital skills by 2025.
- [Communication on achieving a European Education Area by 2025](#) (EEA, September 2020):
 - The communication refers to a digital transition, to digital skills, etc.
 - The Commission also adopted a [Digital Education Action Plan](#) (as one of the actions under the EEA). The plan wants to foster the development of a high-performing digital education ecosystem, with enhanced digital competences for the digital transformation, based on lessons learned from the Covid-19 pandemic.
 - A [resolution](#) on the EEA has been adopted by the Council of Ministers of Education on 19 February 2021.
- Bologna Process and the European Higher Education Area (EHEA)
 - [Rome Communiqué](#) (November 2020): The most recent ministerial conference in the Bologna Process took place on 19 November 2020. The conclusions of that ministerial conference were included in the Rome Communiqué. The Communiqué mentioned digitalisation in higher education:
 - *‘Digitalisation has allowed most of our systems to continue to function during the COVID-19 pandemic, although the intensified use of digital means has brought to light certain limits. With its consolidated experience of transnational and international cooperation and research, higher education must take a leading role in exploring and advising on how to address and overcome these limitations.’ (p. 3)*
 - Some of the topics covered:
 - Digitalisation with attention for inclusiveness;
 - Developing new digital skills and competences;
 - Virtual and blended mobility;
 - Exchanging data.
 - [Bologna implementation report](#) (November 2020): The Bologna process implementation report, which was prepared for the same ministerial conference, also addresses the role of technology in higher education, following the Covid-19 pandemic:
 - *‘The wave of progress in using digital technologies was forced upon us by the pandemic. In the future, however, there will be choices to make and questions of cultural adaptation to address. For example, what will be the appropriate role for digital technologies? How should the human learning and teaching environment relate to the digital environment? How can digital technologies support higher education policy objectives?’ (p. 160); And: ‘Digital tools have a great deal of potential to reinforce both quality education and social inclusion. However, this will not happen automatically, and finding an appropriate role for digital technology will*

require broad thinking on a range of issues. There is an important role for strategic policy planning at both national and European levels.' (p. 161)

- Some of the topics covered:
 - Attention for social inclusion regarding digitalisation;
 - Higher education institutions need support to make optimal use of digital technology and to develop digital skills;
 - Reflection on the impact of blended learning on the higher education experience and on institutions;
 - Importance of social function of higher education institutions;
 - Impact of digitalisation on accreditation and recognition;
 - Digitalisation as a facilitator for new forms of internationalisation.
- [Bologna Digital 2020](#) (May 2019): The publication 'Bologna Digital 2020 - White paper on digitalisation in the European Higher Education Area' brings together opportunities and challenges and good practices on digitalisation in higher education. The paper was written before the start of the Covid-19 pandemic and aims to sharpen the discourse on digitalisation as well as to look ahead towards the future of digitalisation in higher education as a policy focus in Europe.
- [Standards and Guidelines for Quality Assurance in the European Higher Education Area](#) (ESG): The ESG remain the standard for quality assurance in higher education. Although the criteria are not tailored to digital education, digital education cannot be disconnected from other types of education.
- [European Association for Quality Assurance in Higher Education \(ENQA\)](#): ENQA is a membership association whose members are quality assurance organisations in the European Higher Education Area. All members of ENQA must comply with the ESG.
- A recent report from an EUA/Erasmus+ project: [Digitally enhanced learning and teaching in European higher education institutions](#)
 - The report is based on a survey of 368 higher education institutions (in 48 EHEA countries) from April to June 2020, i.e. during the first peak of the Covid-19 pandemic. It looks back to the period before the crisis and ahead to the period afterwards.
 - The aim of the project is to optimize digital learning and teaching in higher education institutions through self-reflection and peer learning.
 - Topics of the survey:
 - Strategy and governance of higher education institutions;
 - Curriculum and teaching methods;
 - Assessment and recognition;
 - MOOCs and 'open learning';
 - Staff support and professional development;
 - Infrastructure and resources.
- Digital Competence Frameworks: These are evidence-based frameworks that describe what it means to be digitally competent for educators ([Digital Competence Framework for Educators](#)); for educational institutions ([Digital Competence Framework for Educational Organisations](#)) and for citizens ([Digital Competence Framework for Citizens](#)).
- European projects in which the Flemish and/or Latvian government are actively involved:
 - [MICROBOL project](#) (Micro-credentials linked to the Bologna Key Commitments): The project focuses on micro-credentials in higher education. By means of such micro-credentials, the learning via short, often digital, courses is recognised. The project aims to question ministries and stakeholders on how existing tools within the European

Higher Education Area can be used and need to be adapted to be applicable to micro-credentials. A [desk research report](#) has been published. The information subsequently obtained through a survey is presented in the [survey report](#). Flanders is closely involved in this European project.

- [OpenU project](#): The project aims to create an innovative European hub to support blended learning, virtual and blended mobility, and academic collaboration and networking in higher education. Both Flanders and Latvia are actively involved in this project. The goals in these three areas are:
 - Blended learning: showcasing online education and creating 'smart catalogues' for courses;
 - Mobility: streamlining administrative processes for student and staff mobility;
 - Collaboration: bringing together guidelines, examples of good practices and tools to facilitate collaboration.

Besides those projects, higher education institutions in Flanders or Latvia are involved in a number of other projects. For the purpose of conciseness, we will not elaborate more in detail on those projects.

- [European recovery and resilience plan](#): Europe is currently in the process of preparing their recovery and resilience plans, which involves a coherent package of reform and public investment projects that will be implemented by 2026. In section 2.2 and 2.3, we outline the implementation of these plans in Flanders and Latvia respectively.

2.2 Recent policy documents in the Flemish context

- Recent policy initiatives in Flanders:
 - ['Digisprong'](#) (= digi-leap) for compulsory education
 - In September 2020, the Flemish Government launched a recovery plan for the post-Covid-19 society. One of the pillars for education is the digitalisation of compulsory education. Flemish Minister of Education Ben Weyts published the [vision paper](#) 'Digisprong, van achterstand naar voorsprong' (Digi-leap, from lag to lead) in December 2020.
 - This vision paper, together with the European action plan for digital education, was explained at an Edu-talk by Vleva (Flemish-European Liaison Office): [The European Action Plan for Digital Education and the Flemish Digisprong](#).
 - In response to this vision paper, the Vlor published its [recommendation](#) on 21 January 2021 (see below).
 - Recovery and resilience plans for higher education
 - In addition to digitalisation in compulsory education, the Flemish Government approved a [vision paper](#) entitled 'Voorsprongfonds Hoger Onderwijs' (Lead Fund Higher education) on 26 February 2021.
 - The Flemish Government wants to invest 60 million euros in higher education. One of the three spearheads is the sustainability of new ways of (digital) education in higher education. Within that spearhead, the Flemish Government focuses on two actions: 1. making new ways of (digital) education sustainable by investing in adapted infrastructure and 2. strengthening the competences of educators concerning digital didactics and digital assessment. The vision paper emphasises the importance of sharing and disseminating good practices.

- [Vlor-recommendation](#) on the vision paper 'Voorsprongfonds Hoger Onderwijs'. The Vlor appreciates the investment in higher education, but raises some concerns related to the content of the vision paper. For instance, the Vlor insists on the further development of a vision related to the three spearheads, and highlights the opportunities of projects situated at the intersection of the spearheads. Furthermore, the Vlor stresses the importance of an effective and efficient operationalisation of the investment.
- Previous recommendations of the Vlor on policy documents in the European context:
 - [Vlor-recommendation](#) on the Rome Communiqué (9 March 2021): The Vlor sees opportunities in an *inclusive* higher education, based on, among other things, data collection on the social dimension of higher education and the realisation of digital inclusion. Higher education should also *innovate* by, among other things, focusing on the development of 21st century skills and digital competences and by realising flexible pathways in the context of lifelong learning (through micro-credentials). To realise an *interconnected* higher education, the Vlor emphasises that physical mobility should remain possible, in addition to virtual and 'blended' mobility, and that internationalisation is broader than staff and student mobility.
 - [Vlor-recommendation](#) on the communication on the EEA (17 December 2020). The Vlor (Flemish Education Council) sees opportunities in closer European cooperation in the field of education and training, but emphasises that the responsibility for the education policy lies with the Member States and their education sector. Moreover, despite the ambitious objectives, many ambiguities remain and many of the proposed actions are still in their infancy. Finally, the Vlor regrets that the Communication pays little attention to democratic citizenship, also in relation to the increasing trend towards digital education.
- Previous initiatives of the Vlor on digitalisation in higher education (Council for Higher Education):
 - [Vlor recommendation](#) on digital learning in higher education (13 May 2014)
 - Recommendation on the possibilities of using ICT in higher education, with attention to pedagogical, financial and organisational preconditions.
 - The reason for this recommendation was the rapid development of digital technologies. As a result, the use of educational technology is also a very actual topic in higher education.
 - The Vlor indicates that digitalisation offers opportunities (e.g. for democratisation, attracting potential students, etc.) The Vlor also emphasises the need for vision development and consultation for a supported and strong policy. In addition, it also argues for the necessary funding for digital infrastructure and for the deployment and professionalisation of teaching staff.
 - [KA3 project curriculum design in higher education](#): In this project on curriculum design in higher education, digitalisation of the curriculum was also discussed.
- Previous initiatives of the Vlor on digitalisation in education (General Council):
 - Recommendation: [Full steam ahead for resilient education: what do we learn from the Covid-19 pandemic for education policy?](#) (26 November 2020). In this recommendation the Vlor draws some lessons from the pandemic for education policy in the medium term. Some of the themes covered are: digital inclusion, digital didactics and pedagogical guidance and professionalisation of teachers, and digital skills of pupils.

- [Recommendation on the vision paper 'Digisprong: van achterstand naar voorsprong'](#) (21 January 2021). The Vlor considers it a good thing that extra resources and policy efforts are being made to promote ICT in education, but gives some comments and success factors for a good ICT integration in compulsory education. Digitalisation should be based on a pedagogical vision and should start from the needs and questions that schools have. In addition, digitalisation requires permanent investments, both in infrastructure and in maintenance, as in information security, skills promotion, etc.

2.3 Recent policy documents in the Latvian context

- [National Development Plan of Latvia for 2021-2027](#): This is the national strategic plan for Latvia. It is a policy document that makes medium-term plans (for the next 7 years) and goes beyond the field of education. Some of the themes covered, related to digitalisation in higher education, are:
 - Importance of digital skills of 16-74-year-olds;
 - Strengthening the effectiveness of (higher) education, among other things by digitalising learning processes.
- Latvia's Education Development Guidelines for 2021- 2027 (the document will be approved by the Parliament). The Guidelines translate and concretise the national strategic plan for the policy area of education. It describes policy priorities in education for the next 7 years. It was developed following the [OECD Skills Strategy Implementation Guidance for Latvia](#).

For higher education digitalisation, the national Skills Strategy document describes 5 domains:

- Quality of study programmes (including development of digital skills and literacy for all students, in particular with a view to increasing the number of IT graduates);
- Development of digital competences for academic staff;
- Management systems and tools at institutional and national level;
- International competition and cooperation;
- Centres of excellence (in certain fields, e.g. HPC, Quantum computing, etc.).

The main goals for digitalisation in Latvia's higher education by 2027 are:

- To actively use digital solutions in learning processes (digital learning platforms, technology-enhanced learning and research, using digital solutions and systems for administration and management at institutional and national level);
- To support digital skills of academic staff in order to use technologies at advanced level;
- To develop a system of lifelong learning (incl. acquisition of digital skills and competences for different groups).
- [OECD publication Going Digital in Latvia](#): Going Digital in Latvia is part of a new series of OECD country reviews on Digital Transformation. These reviews examine recent country developments in the digital economy, analyse policies related to digitalisation and make recommendations to increase policy coherence, both concerning digital skills and as concerning digital solutions in education (which are the important goals in the Latvia's national Skills Strategy document).
- Latvian recovery and resilience plan: The Recovery and resilience plan of Latvia was approved by the Government of Latvia on 27 April 2021. Latvia chose to highlight activities and measures on 'Digital transformation'. In terms of digitalisation in higher education, the development of digital skills for various groups of people and the lifelong learning approach is one of the priority areas for investment.

2.4 Reflection on recent policy documents

In this section, we reflect on the descriptive list of policy documents above. What do we learn from these documents? Which overarching conclusions can be made? Some general observations are:

- There is a large number and great variety of documents on both a European and a national level. However, it seems that many of the challenges and opportunities of implementing digital learning and teaching in higher education recur across documents.
- Some of the documents listed above date back to some years ago. When taking a closer look at these documents, it becomes apparent that many of the challenges still remain, many of the issues have not been resolved, and that many of the recommendations have not been taken up, until today.
- There is no real consensus on what digital learning and teaching involves and what quality in digital learning and teaching constitutes. While there seems to be a need for specifically tailored criteria to look at the quality of digital education, these criteria can actually not be completely separated from other types of education.

These observations confirm the need for a joint understanding of digital learning and teaching, and for an overarching overview of opportunities, challenges and essential preconditions for digitalisation in higher education. This will function as starting point for the POWERHEAD project.

Therefore, based on the above policy documents:

- we define the concept of digital learning and teaching in section 3.,
- we list some opportunities, challenges and essential preconditions for digitalisation in higher education in section 4.,
- and we elaborate on the next steps in section 5.

3 Digital teaching and learning in higher education

3.1 Definition ‘digitally enhanced learning and teaching’

In this background paper, digital learning and teaching is defined as follows:

Digitally enhanced learning and teaching is ‘any type of learning or teaching that is accompanied or supported by technology’.¹ We deliberately opt for a **broad definition** that includes informal learning as well as formal learning. The definition includes but is not limited to digital learning in an educational context.

Despite the broad interpretation of digital learning and teaching, the term ‘accompanied or supported’ is deliberately used, rather than simply ‘applied’. After all, learning does not happen automatically as soon as technology is used. This can only be the case if the technology is adequately integrated (see also 4.2.1 and 4.3.1).

¹ Gaebel, M., Zhang, T., Stoeber, H. & Morrisroe, A. (2021). [Digitally enhanced learning and teaching in European higher education institutions](#). Geneva/Brussels: European University Association absI. p.7

The definition above includes different **degrees and forms of digitalisation**. Digitalisation can be minimal, as is the case in face-to-face classroom teaching supported by an interactive blackboard, or it can be very far-reaching. In between these extremes, of course, there is a whole continuum of digitalisation possibilities. These different possibilities for integrating technology in education have been made explicit in the SAMR-model.² The model identifies four hierarchical steps or stages in designing digital learning and teaching:

- **Substitution** is the first stage, in which technology directly replaces other tools, without any functional change. For instance, a student takes notes on a computer instead of by using a notebook.
- **Augmentation** is the second stage, in which functional improvement begins with the direct tool substitution. For instance, while taking notes on a computer, certain basic functions are used (e.g., cut and paste, spellchecking, etc.).
- **Modification** is the third stage, where tasks get fundamentally redesigned by means of technology. For instance, integrated tasks can get designed by means of email, spreadsheets, and graphing packages.
- **Redefinition** is the last stage, where technology entirely creates new tasks. An example is integrated use of technology with workgroup and content management software.

This way, the implementation of technology ranges from a mere *enhancement* to a substantial *transformation*³ of learning and teaching.

When it comes to relatively far-reaching digitalisation in (higher) education, three categories are generally distinguished:⁴

- **Blended learning** comprises the combination of face-to-face classroom teaching with digital teaching. This takes place both synchronously and asynchronously. In policy documents, it is put forward as ‘the learning of the future’, particularly in higher education.
- **Distance learning** is education that entirely takes place at a distance, usually asynchronously. In the current Covid-19 pandemic, distance learning often takes place in higher education. After all, the context of the pandemic makes it necessary to switch to distance learning, where this would otherwise take place via face-to-face classroom teaching or via blended or hybrid learning.
- **Hybrid learning** has various connotations. The term is sometimes used as a synonym for blended learning. Others use it to refer to the simultaneous combination of face-to-face classroom teaching and online attendance via the ‘virtual hybrid classroom’. While some students receive face-to-face instruction, others participate remotely online at the same time.⁵ This takes place synchronously. All participants are thus simultaneously present in the same teaching and learning environment. In this background paper, we use the latter definition, which is in line with the EUA publication of 2021.⁶

² Puentedura, R. (2006). *Transformation, Technology, and Education*. <http://hippasus.com/resources/tte/>

³ The term transformation is also used in the Higher Education Transformation Agenda that is currently being developed by the European Commission.

⁴ See also new EATDU project, aiming at the development of training modules on three tracks blended education (lead TU Delft), distance education (lead University Barcelona) and hybrid learning (lead KU Leuven Campus Kortrijk). The project start on 1 April 2021 and runs for two years.

⁵ Sometimes, it is called ‘fydgitale education’ (presentation by Flemish Minister for Education Ben Weyts of the Flemish recovery plans, [Vlaamse Veerkracht - 11 december 2020 - YouTube](#))

⁶ Gaebel, M., Zhang, T., Stoeber, H. & Morrisroe, A. (2021). *Digitally enhanced learning and teaching in European higher education institutions*. Geneva/Brussels: European University Association absI.

3.2 Recent technological developments

As indicated in the Bologna Digital 2020 white paper, even before the Covid-19 pandemic, more and more higher education institutions were embracing the process of digital transformation in higher education.⁷ According to the EUA publication of 2021, 57% of the higher education institutions in Europe were already using digital learning and teaching at that time. Since the pandemic, digitalisation in higher education has only accelerated.

In this section, we consider the available digital technologies that bring about a digital transformation in higher education: To what extent do technologies actually reach higher education and, if so, what educational technologies are involved?

3.2.1 Technology versus educational technology

Since the very first technologies existed, people have been looking for ways to use them in education. The central question is how added value can be achieved by embedding technology in the teaching and learning environment. Also the inverse question, on the way in which education can bring added value to technology that is already available in today's society, is relevant.

The development of digital technologies is rapid and can be very far-reaching. Examples are 'Artificial Intelligence' and 'machine learning' (see also 3.2.2). So far, these technologies have only made a limited appearance in higher education, and it is not yet clear what role they will play there in the future. The term educational technology specifically refers to technology that is used in teaching and learning contexts.⁸ The term also covers many technologies that have been developed specifically for education. Examples include MOOCs, Mobile Learning and Learning Analytics⁹ (see also 3.2.2.). It involves technology that is used to *acquire* knowledge, as well as technology that is used to *get access* to the knowledge.

3.2.2 Typologies of educational technology

Several reports¹⁰ give an overview of recent educational technologies. In this background paper, we use the typology of the EDUCAUSE Horizon Report from 2020¹¹. This international community of educational technology experts annually provides an overview of the trends in educational technology that are expected to influence the design of future education. This typology includes developments that are not purely technology-based, but are also linked to a certain educational practice. This distinction between pure technologies and the educational practices associated with them is also made in the 2015 publication of the European project 'The changing pedagogical landscape'.¹²

⁷ Rampelt, F., Orr, D., & Knoth, A. (2019). *Bologna Digital 2020: White paper on digitalisation in the European Higher Education Area*. Berlin: Hochschulforum Digitalisierung.

⁸ Vlor, Raad Hoger Onderwijs. *Advies over het digitaal leren in het hoger onderwijs*, 13 mei 2014.

⁹ Johnson, L., Adams Becker, S., Estrada, V., & Freeman, A. (2014). *NMC Horizon Report: 2014 Higher Education Edition*. Austin, Texas: The New Media Consortium

¹⁰ For instance: Van der Perre, G., & Van Campenhout, J. (2013). *Van Blended naar Open Learning? Internet en ICT in het Vlaams hoger onderwijs*, Koninklijke Vlaamse Academie van België voor Wetenschappen en Kunsten, Klasse Technische Wetenschappen; Gaebel, M., Zhang, T., Stoeber, H. & Morrisroe, A. (2021). *Digitally enhanced learning and teaching in European higher education institutions*. European University Association absi; Haywood, J., Connely, L., Henderikx, P., Weller, M., & Williams, K. (2015). *The changing pedagogical landscape: New ways of teaching and learning and their implications for higher education policy*. Luxembourg: Publications Office of the European Union. doi:10.2766/57677.

¹¹ Brown, M., McCormack, M., Reeves, J., Brook, D. C., et al. (2020). *2020 Educause Horizon Report Teaching and Learning Edition*. Louisville, EDUCAUSE.

¹² Haywood, J., Connely, L., Henderikx, P., Weller, M., & Williams, K. (2015). *The changing pedagogical landscape: New ways of teaching and learning and their implications for higher education policy*. Luxembourg: Publications Office of the European Union. doi:10.2766/57677.

The following emerging educational technologies are mentioned in the EDUCAUSE Report¹³:

- Adaptive learning: Digital platforms and applications based on adaptive technology can be used to design personalised learning, i.e. learning that is tailored to the needs of individual students.
- ‘Artificial Intelligence’ and educational applications based on ‘machine learning’: While ‘machine learning’ is based on the idea that machines are able to learn and adapt themselves by means of repetitive processes, ‘artificial intelligence’ refers to the idea that machines can execute tasks intelligently.
- ‘Learning analytics’: There are tools that collect and analyse data about the progress of students, and thus promote their learning along the way.
- Instructional/learning design: This is an umbrella term that points to a well-defined role of educators or didactic teams, with the development of learning environments being central. It involves the use of certain pedagogical strategies, student-centred learning activities, innovative ways of using technology in teaching, and associated assessment activities.
- Open Educational Resources: There is a variety of materials that are designed to support learning and teaching and that are openly available to educators and students.
- ‘Extended reality’ technologies (Augmented Reality, Virtual Reality, etc.): This is an umbrella term for environments that immerse students in a realistic virtual experience or that combine the physical environment with a virtual one.

Other types of educational technology that are often mentioned in other typologies are:

- Internet of things, which involves ‘the interconnection via the internet of computing devices embedded in everyday objects, enabling them to send and receive data’¹⁴. This technology is useful for location-based learning and experimentation, and
- blockchain, which is ‘a distributed ledger that provides a way for information to be recorded and shared by a community. In this community, each member maintains his or her own copy of the information and all members must validate any updates collectively’¹⁵. This technology is relevant for micro-credentials.

Within educational technology, we do not make a distinction between hardware and software. After all, educational technology is often a combination of both.

4 Opportunities and challenges of digitalisation in higher education

The use of technology in higher education offers many opportunities, but also brings challenges. In what follows, opportunities and challenges are discussed. In all sections, a distinction will be made between the following two categories: ‘teaching and learning’ and the ‘organisation of higher education’, ‘Teaching and learning’ constitute the core processes in education. The ‘organisation of higher education’ entails all secondary processes in an institutional context that indirectly strengthen higher education institutions’ and systems’ capacity to enhance learning and teaching. Of course, both categories cannot be completely separated or disconnected from each other.

¹³ Brown, M., McCormack, M., Reeves, J., Brook, D. C., et al. (2020). [2020 Educause Horizon Report Teaching and Learning Edition](#). Louisville, EDUCAUSE.

¹⁴ Oxford, (2020); in Gaebel, M., Zhang, T., Stoeber, H. & Morrisroe, A. (2021). [Digitally enhanced learning and teaching in European higher education institutions](#). Geneva/Brussels: European University Association absI, p. 8

¹⁵ Grech & Camilleri (2017); in Gaebel, M., Zhang, T., Stoeber, H. & Morrisroe, A. (2021). [Digitally enhanced learning and teaching in European higher education institutions](#). European University Association absI, p. 7

4.1 Opportunities

4.1.1 For learning and teaching

- **Designing quality education**
Technology is one of the elements within a teaching and learning environment that can contribute to quality education (see 'instructional/learning design' approach in 3.2.2).
- **Promoting student learning**
The targeted use of technology in higher education can lead to greater effectiveness and efficiency in achieving learning objectives. Educational technology can enable educators to monitor the progress of learning, can take over repetitive tasks from educators, etc. This frees up time for educators to supervise students individually or in groups, based on the available data.¹⁶
- **Motivate and connect with the world of students**
Students are born in a digital world, and contemporary higher education can no longer do without technology either. Technology connects to the world of students. Therefore, using technology in higher education can boost their motivation.
- **Contribute to inclusion**
Students (in particular students from disadvantaged groups, for example students with a vulnerable socio-economic background, students with a functional disability, etc.) can be supported by technology in various differentiated learning trajectories. Here we refer to the principle of 'Universal Design', i.e. designing education in such a way that all students can participate and get the best learning opportunities¹⁷.
- **Collaboration and exchange between teaching staff and students**
Digital technology can be used to support cooperation and exchange between teaching staff¹⁸, both within and between higher education institutions. Besides collaboration and exchange between teaching staff, digital (learning) platforms can support such cooperation and exchange between students too, and may help in creating a community feeling amongst students. The digital aspect not only allows teaching staff and students to collaborate and exchange at the national level, but also internationally.

4.1.2 For the organisation of higher education

- **Preparing students for digital society**
Technology is omnipresent in today's society. Through digitalisation, students can be prepared for a rapidly changing and increasingly digital society and labour market.
- **Creating a professional field**
Technology supports the creation of a professional field. By means of technology such as virtual reality, students get the opportunity to acquire 'hands off' skills in a safe environment.
- **Reaching more and more diverse students**
Digitalisation offers opportunities to reach more and more diverse students, also in the context of lifelong learning, and to offer them flexible learning pathways. More specifically, this can be done by means of distance learning, differentiation in learning pathways based on accreditation of prior learning, various (digital) programmes in the context of lifelong

¹⁶ Gaebel, M., Zhang, T., Stoeber, H. & Morrisroe, A. (2021). [Digitally enhanced learning and teaching in European higher education institutions](#). Geneva/Brussels: European University Association absI.

¹⁷ Steunpunt Inclusief Hoger Onderwijs (n.d.). [Leidraad Universeel Ontwerp: van beleid naar praktijk](#).

¹⁸ Gaebel, M., Zhang, T., Stoeber, H. & Morrisroe, A. (2021). [Digitally enhanced learning and teaching in European higher education institutions](#). Geneva/Brussels: European University Association absI.

learning (shorter or longer permanent training, ba-na-ba (bachelor-after-bachelor)/ma-na-ma (master-after-master), postgraduate, etc.), virtual or 'blended' international mobility, etc.¹⁹ This will be beneficial for the accessibility of higher education.

- **Increasing flexibility of the educational offer**
Offering, valorising and recognising shorter (parts of) learning programmes, by means of micro-credentials for instance, to different target groups could be more easily accomplished by means of technology.
- **Contributing to innovation in higher education**
In addition to using technology in higher education, higher education institutions also contribute to the development of new technologies. This in turn contributes to innovation in higher education.²⁰
- **Strengthening the participation of educators and students**
As pointed out in the 2014 Vlor recommendation on digital learning²¹, educational technology can contribute to strengthening the participation of educators and students in the organisation and policy of their courses and institutions.
- **Supporting the follow-up of students**
Technology such as learning analytics helps educators to follow-up students' activity. This is particularly useful when blended, hybrid, or distance learning is used, as has been the case during the Covid-19 pandemic.
- **Administrative support via digital platforms**
Digital technology can be used to support various administrative processes in higher education institutions.
- **Common use of resources**
Digitalisation in higher education allows teaching staff to share, exchange, and reuse resources via digital platforms.

4.2 Challenges

4.2.1 For learning and teaching

- **Education-driven instead of technology-driven**
A danger lurks in the hype-based implementation of new hardware and software. This not only creates dependency on ever-new technological developments, but also carries the danger that technology is regarded as an end in itself²², rather than as a means to design quality education. In other words, as the 2014 Vlor recommendation²³ stated: it is crucial that innovations are 'education-driven', not 'technology-driven'.
- **Importance of educational design**
When new technology makes its appearance in education, there are often high expectations. The hope is that this new educational technology will bring about a digital transformation. The technology is seen as a 'proxy' for a new pedagogical approach. Often, however, the

¹⁹ Vlor, Raad Hoger Onderwijs. [Opvolging van het Bolognaproces: Advies over het Romecommuniqué en aandachtspunten voor Vlaanderen](#), 9 maart 2021; ook zie EHEA Rome 2020 (2020). [Rome Ministerial Communiqué 19 november 2020](#). Rome: EHEA.

²⁰ Vlor, Raad Hoger Onderwijs. [Advies over het digitaal leren in het hoger onderwijs](#), 13 mei 2014.

²¹ Vlor, Raad Hoger Onderwijs. [Advies over het digitaal leren in het hoger onderwijs](#), 13 mei 2014.

²² Haywood, J., Connely, L., Henderikx, P., Weller, M., & Williams, K. (2015). [The changing pedagogical landscape: New ways of teaching and learning and their implications for higher education policy](#). Luxembourg: Publications Office of the European Union. doi:10.2766/57677.

²³ Vlor, Raad Hoger Onderwijs. [Advies over het digitaal leren in het hoger onderwijs](#), 13 mei 2014.

teaching method is retained even when new educational technology is implemented, for example in the case of MOOCs. In that case, educational technology lacks its impact.²⁴

The use of (new) digital educational technology does not automatically lead to better educational quality and, in turn, to learning gains. Simply deploying a new digital educational technology without substantially changing the associated teaching methods, does not make a difference to learning. This finding is also central in Russell's leading publication from 1999²⁵ and the associated database that is regularly updated on the 'no significant difference phenomenon'.²⁶ This publication and database give an overview of research reports that found no significant difference in learning outcomes between different media - which also includes digital educational technology. The 'educational design' challenge for educators is to look for a good implementation of educational technology in education.

- **Particular challenges for certain learning objectives, students and contexts**

There is no such thing as 'the optimal blend' of digital learning and face-to-face classroom teaching that works for every educational context, every educational objective and every group of students.²⁷ The question is always: Given particular learning objectives, students (target group) and an educational context, is the implementation of this educational technology suitable? Based on the specific situation, it needs to be considered whether or not a digital approach is most appropriate, and if so, which approach.

- **No 'one-size-fits-all' approach**

There are many situations in which caution is needed in the excessive implementation of educational technology. Think, for example, of students with limited self-regulation skills, or learning objectives where interaction and social contact are central. Personalised teaching and assessment for specific (groups of) students can also be supported by means of technology.

- **Attention for digital inclusion**

There are students from disadvantaged groups who do not have access to a quality ICT infrastructure in their home environment. The 'digital divide' that can arise this way requires attention.²⁸ It is important that solutions are found for these students, so that the additional cost of the infrastructure is not passed on to students from disadvantaged groups.

- **Digital competences of educators and students**

Although digital competences are necessary for the successful implementation of technology in higher education, they are anything but self-evident. Technology is, after all, evolving at a lightning pace. Digital competences of educators include both technological, pedagogical and content knowledge and skills, as well as knowledge and skills at the intersection - which is the focus of the TPACK model²⁹. The educators must know the possibilities of ICT, see them and be able to use them at the right time. In this respect, we

²⁴ Haywood, J., Connely, L., Henderikx, P., Weller, M., & Williams, K. (2015). [The changing pedagogical landscape: New ways of teaching and learning and their implications for higher education policy](#). Luxembourg: Publications Office of the European Union. doi:10.2766/57677.

²⁵ Russell, L. (1999). *The no significant difference phenomenon: A comparative research annotated bibliography on technology for distance education: As reported in 355 research reports, summaries and papers*. Raleigh, NC: State University Press

²⁶ <https://detaresearch.org/research-support/no-significant-difference/>

²⁷ Haywood, J., Connely, L., Henderikx, P., Weller, M., & Williams, K. (2015). [The changing pedagogical landscape: New ways of teaching and learning and their implications for higher education policy](#). Luxembourg: Publications Office of the European Union. doi:10.2766/57677

²⁸ Vlor, Raad Hoger Onderwijs. [Opvolging van het Bologna-proces: Advies over het Romecommuniqué en aandachtspunten voor Vlaanderen](#). 9 maart 2021

²⁹ Koehler, M. J. (2006). Technological Pedagogical Content Knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017-1054. doi: 10.1111/j.1467-9620.2006.00684.x.

also refer to the Digital Competence Frameworks³⁰, which are evidence-based frameworks that describe what it means for an educator or for an organisation to be digitally competent. Not only educators but also students must have the necessary digital competences. For students too, the development of digital competences is a challenge: this not only concerns general digital competences that young people develop in everyday life, but also digital competences in specific fields of study as well as aspects concerning ethics, data literacy, security, etc.³¹

- **Positive attitude of educators and students to digitalisation**

A positive attitude towards digitalisation in higher education is not self-evident either. A study by the EUA shows that staff is generally less positive about digital learning and teaching than students.³² However, the attitude of students may have changed during the Covid-19 period, in which they were immersed in digitalisation in higher education for a long time (i.e. the ‘novelty effect’ has meanwhile disappeared). Moreover, the challenge is how to create and consolidate a community feeling in the learning community in which students take part.

- **Quality assessment supported by digital technology**

There is a growing trend towards digital assessment, but it is a challenge to design quality assessment that is supported by digital technology (simulation, video performance, etc.), as a part of the educational environment. This is especially the case for, for instance, the assessment of hands-on-skills that are required by the professional field.

- **Information architecture and design of materials**

It remains challenging to prepare materials well, so that they are easily accessible for students.

4.2.2 For the organisation of higher education

- **Increasing workload for educators**

Digitalisation in higher education harbours the danger of an increased workload and administrative obligations for educators (i.e. accountability and control). The accompanying workload distracts educators from their core task. This way, the uniqueness, professionalism and capacity of educators is put under pressure. The traditional models for calculating staff workload are no longer sufficient.

- **Need for professionalisation of educators**

Because it is essential that educators have the necessary digital skills and keep abreast of (educational) technology, the professionalisation of educators is crucial. Support within higher education institutions and/or centrally at the national level is necessary.

- **Attention needed for privacy & security of educational data and for reuse of material**

Digitalisation in higher education goes hand in hand with challenges related to privacy (GDPR) and security (cyber security, risk of hacking, etc.) of educational data, as well as the reuse of material (copyright & IPR).³³ Such measures entail costs and the need for staff support. Moreover, there is a danger that commercial players will (partially) take over core educational tasks.

³⁰ <https://ec.europa.eu/jrc/en/digcompedu> and <https://ec.europa.eu/jrc/en/digcomporg>

³¹ Gaebel, M., Zhang, T., Stoeber, H. & Morrisroe, A. (2021). *Digitally enhanced learning and teaching in European higher education institutions*. Geneva/Brussels: European University Association absI.

³² Gaebel, M., Zhang, T., Stoeber, H. & Morrisroe, A. (2021). *Digitally enhanced learning and teaching in European higher education institutions*. Geneva/Brussels: European University Association absI.

³³ Gaebel, M., Zhang, T., Stoeber, H. & Morrisroe, A. (2021). *Digitally enhanced learning and teaching in European higher education institutions*. Geneva/Brussels: European University Association absI.

- **Impact on the broader organisation of higher education: spatial design, facilities, internationalisation, etc.**

Far-reaching digitalisation has its impact on the spatial design of higher education (Will campuses remain the place where higher education is organised?) and on the facilities that are organised on these campuses (student accommodation, sports, social services, etc.).³⁴ In addition, digitalisation offers challenges for the realisation of internationalisation. Think for instance of internationalisation@home, or virtual or 'blended' student mobility. These new forms of mobility create new challenges.

- **Relation to other major challenges related to the digital transition**

Digitalisation is often linked to other challenges that go beyond education, such as the climate challenge. On the one hand, digitalisation leads to energy savings through reduced travel and thus contributes to the realisation of a 'green campus', but on the other hand, it appears that the increase in videoconferencing increases energy consumption. The obvious link between sustainability and digitalisation does not always hold.³⁵

- **Continuing education and open education**

The challenge is to develop a sustainable digitalisation strategy for diverse types of (higher) education; Besides digitalisation in the basic higher education provision, digitalisation is also being implemented in the lifelong learning provision and in the open education provision (including MOOCs).³⁶

- **Organisation of digital assessment**

There is a growing trend towards digital assessment, but this brings challenges in terms of quality assurance, organisation and practical feasibility, valorisation and recognition, etc. Not only formative assessment, but also summative assessment can take place digitally.³⁷

4.3 Essential preconditions

4.3.1 For learning and teaching

Achieving added value via embedding educational technology in the teaching and learning environment is an essential precondition for successful digitalisation in higher education. It is thus crucial to embed educational technology in a teaching and learning environment in a targeted way so that it promotes student learning.³⁸ Assessment must also be included in the design of digital teaching and learning environments.

4.3.2 For the organisation of higher education

- **Modernising the infrastructure**

Modernising the ICT infrastructure in higher education institutions is necessary. This includes the choice of both hardware and software. These choices are partly determined by the vision and context of the higher education institutions. It is crucial that this infrastructure is made available to all students as much as possible in order to realise digital inclusion.

³⁴ Vlor, Raad Hoger Onderwijs. *Advies over het digitaal leren in het hoger onderwijs*, 13 mei 2014.

³⁵ See also: Vlor, Algemene Raad. *Achieving the European Education Area?*, 17 December 2020.

³⁶ Haywood, J., Connely, L., Henderikx, P., Weller, M., & Williams, K. (2015). *The changing pedagogical landscape: New ways of teaching and learning and their implications for higher education policy*. Luxembourg: Publications Office of the European Union. doi:10.2766/57677.

³⁷ Gaebel, M., Zhang, T., Stoeber, H. & Morrisroe, A. (2021). *Digitally enhanced learning and teaching in European higher education institutions*. Geneva/Brussels: European University Association absI.

³⁸ Vlor, Raad Hoger Onderwijs. *Advies over het digitaal leren in het hoger onderwijs*, 13 mei 2014.

- **Adequate funding**
In order to realise digital learning and teaching, adequate basic funding for higher education institutions is crucial, together with a system/platform for larger projects for the implementation of digital learning and teaching in higher education.
- **Professionalisation of teaching staff (teaching aspect)**
Professionalisation of teaching staff is necessary, in terms of technological and pedagogical-didactical skills, and at the interface in between both. These digital pedagogical-didactical competences can be developed by means of training courses for beginning teaching staff and in-service training. Such professionalisation can also contribute to the motivation and to a positive attitude towards digitalisation in higher education of (teaching) staff.
- **Developing students' digital competences**
Besides educators, students should have the necessary digital competences too. It is the task of higher education institutions to determine how digital competences are integrated into the various curricula, programmes, and course units in various fields of study.³⁹
- **Importance of support functions in and outside institutions**
The presence of technical support for teaching staff in higher education institutions is a critical precondition, as is the presence of pedagogical-didactical support. The latter also includes the attention for the social aspect of digital learning and teaching. To develop this pedagogical-didactical support, in most higher education institutions, professional 'instructional designers' collaborate with educators, in order to design blended and fully online course units. Such 'design teams'⁴⁰ apply systematic and explicit design approaches, based on existing frameworks, tools, and methods for designing education. In addition to these 'design teams', online databases of educational resources, an online platform for exchanging and building knowledge, or a central support unit are valuable.⁴¹
Central support at the national level can also be considered. As indicated in the 2014 Vlor recommendation⁴², a central platform in Flanders could, for example, take on the necessary monitoring and trendwatching in the field of new educational technologies.
- **Developing and conveying a vision in higher education institutions**
The development of a strategic vision on digitalisation in higher education institutions is crucial for successful digital learning and teaching. After all, successful digitalisation starts from the type of education that the higher education institution wishes to realise, not from the technology itself. Such vision development requires good leadership⁴³, which ensures that this strategy is also agreed on at institutional level and supported by all supporting services. All partners must be involved (including staff/students) in this vision development, in order to be able to implement a sufficiently shared policy.

³⁹ Gaebel, M., Zhang, T., Stoeber, H. & Morrisroe, A. (2021). [Digitally enhanced learning and teaching in European higher education institutions](#). Geneva/Brussels: European University Association absl.

⁴⁰ Haywood, J., Connely, L., Henderikx, P., Weller, M., & Williams, K. (2015). [The changing pedagogical landscape: New ways of teaching and learning and their implications for higher education policy](#). Luxembourg: Publications Office of the European Union. doi:10.2766/57677.

⁴¹ Gaebel, M., Zhang, T., Stoeber, H. & Morrisroe, A. (2021). [Digitally enhanced learning and teaching in European higher education institutions](#). Geneva/Brussels: European University Association absl.

⁴² Vlor, Raad Hoger Onderwijs. [Advies over het digitaal leren in het hoger onderwijs](#), 13 mei 2014.

⁴³ Koninklijke Vlaamse Academie van België voor Wetenschappen en Kunsten. Standpunt nr. 19. Juni 2013. Van blended naar open learning? Internet en ICT in het Vlaams hoger onderwijs; Haywood, J., Connely, L., Henderikx, P., Weller, M., & Williams, K. (2015). [The changing pedagogical landscape: New ways of teaching and learning and their implications for higher education policy](#). Luxembourg: Publications Office of the European Union. doi:10.2766/57677.

- **Embedding in quality assurance⁴⁴**

It is crucial to embed digital learning and teaching in the quality assurance of higher education institutions. The framework for the Quality Assurance of e-Assessment⁴⁵ developed in 2019 can, for example, provides inspiration for dealing with the challenges of quality assurance in digital assessment.

- **Health aspects**

From the precautionary principle, attention is needed for possible health aspects, such as ergonomics, screen addiction, permanent accessibility of staff and students, cyberbullying among students and staff, changing classroom cohesion, etc.⁴⁶ In addition, issues such as privacy (GDPR), security (cyber security, risk of hacking, etc.) and reuse of material (copyright) also deserve attention when realising digitalisation in higher education.

5 Next steps

In this background paper, we have:

- offered a view on the current policy in the field of digitalisation in higher education;
- given a broad definition of digital learning and teaching;
- described the opportunities and challenges associated with digitalisation in higher education;
- and pointed out a number of preconditions that need to be met.

The ultimate **goal** of the POWERHEAD project is to develop guidelines for further shaping a sustainable policy on digital learning and teaching in higher education at the national level, as well as recommendations for higher education institutions. A next step is to perform a needs analysis. This entails making an inventory of the needs of various actors in the field of higher education in order to develop a well thought-out policy on digital learning and teaching.

The further design and implementation of a well thought-out digitalisation policy in higher education requires a certain degree of change and renewal. That is why we shape the next step of the project based on a guiding model on digitalisation from the perspective of 'change management'. The **central question** here is: What is needed to conduct a well thought-out digitalisation policy and to continue the digital transition?

This is based on Laurillard's (2015) model⁴⁷ for a systemic analysis of innovation in higher education. The model identifies various 'drivers' and 'enablers' that together bring about change/renewal. 'Drivers' are the steering elements of a higher education system that determine how teachers/leaders prioritise their activities. 'Enablers' are the facilities and mechanisms that teachers/leaders need, in order to adapt their activities to respond effectively to the 'drivers'.

The 'drivers' and 'enablers' in this model will, on the basis of the present background paper, further be concretised into themes and linked to a number of specific accompanying questions that will be presented to various (groups of) actors in the field of higher education.

⁴⁴ See several publications by the European Association for Quality Assurance in Higher Education (ENQA) op <https://enqa.eu/index.php/publications/>

⁴⁵ See <https://www.kwaliteitszorg.vluhr.be/files/D4.7-Framework-screen-TeSLA-2606.pdf>

⁴⁶ Vlor, Algemene Raad. *Voorwaarden voor succesvolle ICT-integratie in onderwijs. Advies over de visienota 'Digisprong: van achterstand naar voorsprong'*, 21 januari 2021.

⁴⁷ Laurillard, D. (2015) *Thinking about Blended Learning. A paper for the Thinkers in Residence programme*. In: Van der Perre, G and Campenhout, J. V., (Eds.) *Higher education for the digital era; A thinking exercise in Flanders*. (pp. 7-33). Brussels, Belgium: KVAB