TRAINING MATERIAL

NEW EDUCATIONAL OPPORTUNITIES CREATED BY DIGITAL TECHNOLOGIES AND BARRIERS TO GOING DIGITAL

New Educational Opportunities Created by Digital Technologies and Barriers to Going Digital

The aim of this material is to give you an understanding of how educational content can be offered in different formats through different channels. It contains a general overview of how courses can be organised and delivered in a way that is more relevant for a faster-moving digital generation. You can also find examples of multimedia and online resources that can be integrated into the classroom.

Learning Objectives

- To understand how digital technologies are enabling new educational opportunities
- To interiorize how the roles of learners and teachers are changing
- To identify the new opportunities for formal learning
- To get acquainted with the main tools available to manage, plan, deliver and track the learning process
- To detect the barriers you may find when going digital
- To find ways to overcome these barriers

Unit 1: Accessible and flexible educational contents

Module 3: New Educational Opportunities Created by Digital Technologies and Barriers to Going Digital

The ESCALATE Module 3 is composed by 3 units:

1. **Accessible and flexible educational contents**
2. New software and apps to help learning providers to manage, plan, deliver and track the learning process
3. Barriers to going digital

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The objectives of this Unit are:

- To understand how digital technologies are enabling new educational opportunities
- To interiorize how the roles of learners and teachers are changing
- To identify the new opportunities for learning

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1.2	Change in expectations of learners
1.3	Change in roles of teachers and learners
1.4	Trends in education
1.5	New learning methods
1.6	Access to Lifelong learning

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1.1. Massive amounts of information available

The textbook is no longer the main tool for teachers. Today, it is common to see how textbooks coexist or have been replaced by tablets and other electronic devices that teachers use as pedagogical tools.

This implies a change in the approach of class activity by the teachers, an improvement in the educator-learner interaction and a more adapted learning with tools for monitoring statistical data of the learning process.

As the years go by, the way we learn changes. From encyclopedia to Encarta to Wikipedia. Nowadays, there are massive amounts of information available and access to learning opportunities has never been so universal thanks to digitalization.

Different results are obtained from the use of the different formats by universities and other higher education institutions. For a search for information it may be easier to use tablets or computers, while for a more calm and concentrated reading the paper book could be more effective. The essential thing is that students are able to use any kind of tool and, hence, it is necessary to use each and every one of them.

Source: [1]
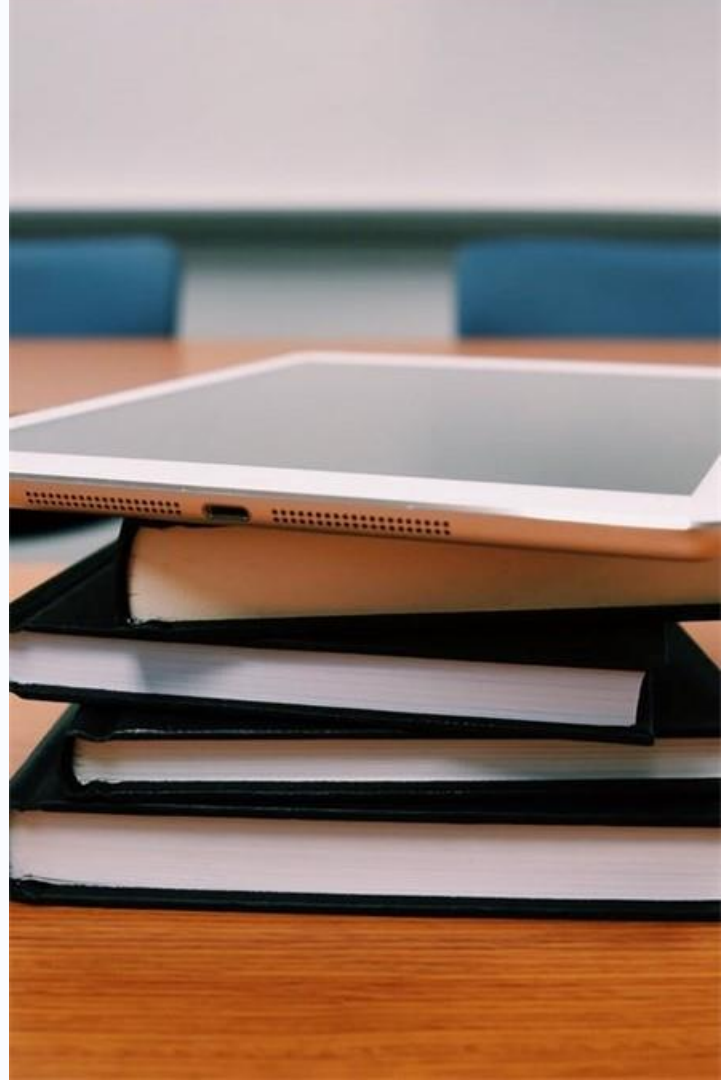
1.2. Change in expectations of learners

- The expectations of learners are rapidly changing.
- The previous generations' motivation to study was strongly based on sense of duty, however, younger generations are motivated by interest, emotions, and engagement. They are also less motivated by just monetary reasons, but by passion and purpose.
- In addition, young people are no longer satisfied with traditional lectures, they demand a more dynamic and engaged form of education, they need fast, flexible and affordable learning solutions.
- They are expecting more practical learning plans and experiences, as well as more experiential learning sessions.
- New learners are also demanding mentoring for personal and professional growth.
- Their objective is not only to obtain a degree but also to garner job-ready skills with the flexibility to study away from campus.
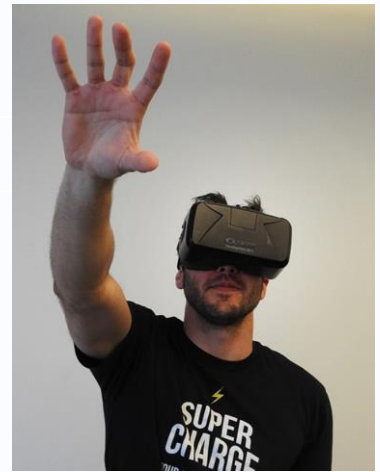
- The millennial generation was born into a world of internet, social media and mobile technology. Many of these students have been all their lives using the latest devices, game consoles, high tech applications and even virtual and augmented reality. Students expect to have at University at least the same high-tech experience they get at home.
- University leaders need to understand that it's the connection between digital engagement and student experience which leads to real change. It is not just about new technologies, learners must be engaged and involved.
- Peer learning and collaboration, enabled by high-tech tools can help obtain the steady stream of information, insights and recommendations that the learners need to inform decisions and guide experiences.

Source: [4], [5], [6]

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1.3. Change in roles of teachers and learners

- Teachers used to be instructors but today, their role has evolved and they are becoming coordinators, facilitators, coaches, mediators and creators of learning opportunities.

- Educators are expected to know where to find the information, how to solve problems and what is important to learn.

- Teachers are asked to support students in their learning processes, they have to help them to be critical, to be open-minded, to check the quality of the sources.

- The educator is also required to improve teaching methods, to train him/herself and to acquire knowledge.

- Educators are increasingly collaborating with each other thanks to modern technology. They are sharing skills and learning from each other.

- The way teachers interact with students is changing as well.

- To carry out these new roles, a transformation is required.

Source: [8]

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1.3. Change in roles of teachers and learners

New technologies

- Digitalization facilitates the creation of new teaching models as teachers can use more open means of communications and media to experiment and to disseminate their ideas.
- Educators no longer have to impart learning in a linear fashion, but can use new platforms as a guide, helping students access and consume information in a considered and meaningful manner.
- They can test the response to different content, so they can iterate to improve student outcomes.
- They can identify what individual learners want, leading to greater personalization.
- With the latest tech tools, they have new possibilities to explore, for example:
  - o Video conferencing to bring students into classrooms.
  - o Productivity applications to offer real-time feedback or set up collaborative sessions.
  - o Multimedia and visual learning, or podcasts to bring topics alive.
  - o Game-based learning to challenge students in a fun and competitive environment.
  - o Virtual reality to create an immersive experience.

Source: [9]

Good practice

Quality Pact for Teaching

Since 2011, the Bundesministerium für Bildung und Forschung (BMBF) has been supporting the improvement of study conditions and teaching quality at German universities with the program "Quality Pact for Teaching" (QPL) in cooperation with the Federal States.

The universities are supported in qualifying their staff for teaching, supervision and counselling. Further goals are to ensure and develop high-quality university teaching. A central field of action is the digitalization of teaching and the associated integration of electronic learning modules into the regular curriculum. In the period from 2011 to 2020, projects, measures and structures totalling 2 billion euro have been financed at the universities. From 2021 onwards the follow-up program "Innovation in higher education teaching" aims to create structures for permanent support for the further development of university teaching. The aim is to promote the exchange and networking of relevant actors as well as the transfer of knowledge for successful teaching and new results and findings. In order to provide continuous incentives to design teaching innovations, the development of innovative study and teaching formats is to be supported by appropriate funding.

Source: [21]

1.3. Change in roles of teachers and learners

News skills

Digitalization is transforming the skills needed by Europe's working population to successfully engage in the world of work in a globalized modern economy. Jobs are changing and the young people entering the labour market need to be prepared for transitions in an uncertain future.

Educators today have the responsibility to guide the development of 21st century skills in their students. They have to help them develop skills such as critical thinking, problem solving and lateral thinking. Educators must channel innovation and creativity in the classroom. And they must encourage adaptability and resilience, to help students navigate disruption and change.

Source: [9]

Reflection

Have the roles changed at your university?

- Think about your own university…

- What were the learners' expectations 10 years ago? And the role of the teachers?

- And what about now? Have the expectations and roles changed some how?

- Write down the differences.

1.4. Trends in education

- Education is being offered a wide new range of new possibilities and tools.

- Smart technology co-evolves rapidly with new learning approaches.

- Today, there are many technological tools and resources, which, if harnessed properly in the world of higher education, can have an enormous impact on the learning process of learners, making it more practical, appealing and efficient.

- It is crucial to integrate technology in the classroom and to improve the quality and effectiveness of educational process.

- Learning becomes increasingly blended or hybrid which means that Face-To-Face and Peer-To- Peer instruction is often combined with online learning environments.

Source: [10], [11]

1.4. Trends in education

Online learning or e-learning

- Online education or e-learning is a student-led model that allows the learner to follow his/her own pace and adequately grasp the material and succeed in the learning process.
- Accessibility, flexibility, ubiquity, quality and self-management are some of the advantages.
- Blended learning combines face-to-face classes with online learning.
- Online learning platforms can personalize the learning of the individuals. If the learner encounters a problem in the learning process, the system suggests lessons to help the learner get over it.

Mobile Learning or M-learning

- Mobile learning or M-learning, is a new way to access learning content using personal electronic devices such as smartphones.
- Contents in M-learning can include short videos, small documents, short lessons, etc.
- M-learning enables learners to take their learning materials with them.
- It's also possible to use mobile devices for a blended learning approach. Combining deeper training sessions with short lessons through M-learning makes the learning process more efficient.

Video-based Learning

- Video- based learning is gaining popularity because it suits learners with any learning style preferences and include audio material (listening), text (reading), images (watching), and even kinaesthetic elements (practical exercises and video pause/repeat).
- Video content is more engaging and people are more likely to remember videos, allowing for the learner to engage more wholly.
- Learners can process information faster and more effectively (the human brain processes videos 60,000 times faster than text) and they can access these resources anywhere, at any time.
- Video-based learning is quite likely to dominate online education (as well as many types of offline education).

Game-based learning

- Learning through game-based learning and games can significantly enhance good quality and effectiveness of education.
- Games are now being recognised as having great potential to have a positive impact on students' learning experience.
- Game-based learning is increasingly gaining momentum in higher education.
- Game-based learning helps to keep learners motivated by making the learning content more attractive and giving immediate satisfaction during each lesson.
- Games are increasingly being integrated at a curriculum level in addition to being used as stand-alone activities.
- Serious games can be designed to achieve a particular curriculum need.

Personalized Learning

- Each year, there are new and updated applications and platforms for learners to experience a more customizable learning process.
- Big data analytics and artificial intelligence (AI) can be used to personalize the learning experiences even further.
- An individual approach means more motivation, engagement, less drop-outs, and more efficiency.
- AI-based learning systems can give teachers useful information about their students' learning styles, abilities, and progress, and provide suggestions for how to customize their teaching methods to students' individual needs.
- Learners can reach their full potential personalizing their learning process by choosing topics, exercises, difficulty level, schedule, etc. in applications they use for their studies.

Virtual Reality (VR)- based Learning

- Virtual Reality (VR) seems to be the natural next step for the evolution of education.
- VR education works by creating a virtual world (real or imagined) and allows users to see it and interact with it.
- The learner is immersed in what he/ she is learning and requires less cognitive load to process the information.
- VR is a good solution for highly technical training fields. Virtual laboratories for example allow students to understand how things work based on practical experience.
- VR can also help put educators and students together in the same room with digital representations of themselves and the teacher can guide students through their experiences.

Source: [12], [13], [14], [15], [16], [17]

1.5. New learning methods

Examples of learning methods that can enhance the learning experience and help achieve better academic performance.

Flipped Classroom

Pedagogical approach in which the traditional elements of the lesson taught by the teacher are reversed – the primary educational materials are studied by the students at home and, then, worked on in the classroom.

Design Thinking

Applies stems from industrial designers and their unique method to solve problems and satisfy the needs of their clients.

Cooperative Learning

The final goal is always group-oriented and will be achieved if each of the members successfully performs their tasks.

Project-Based Learning

Allows students to acquire key knowledge and skills through the development of projects that respond to real-life problems.

Good practice: EPALE - Electronic Platform for Adult Learning in Europe https://epale.ec.europa.eu/en

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Source: [19]

Reflection

- Try to think about the last learning session you attended...

- Was it online or face-to-face?

- What kind of learning methods were there used?

- Did you find any of them innovative?

- Now think about how you would improve the training with the methods you have just learned about.

1.6. Access to Lifelong learning

- Education does not end at university.
- Digital techniques and technologies are constantly evolving and there is a concurrent need to up-skill people across their working lives.
- Lifelong learning is a new educational paradigm which consists of learning throughout our lives, and adapting our knowledge and skills to the market's needs at any time.
- Lifelong learning is one of the most important keys to the transformation process in order to sustainably secure individual work and employability - even beyond company boundaries.
- The Internet and other new technologies are often viewed as an important way to facilitate lifelong learning: the possibilities offered by lifelong learning in terms of training are multiple thanks to the breakthrough of educational innovations.
- Across the world, online learning is providing workers with an affordable and flexible model of lifelong learning.
- There is an increasing need to position universities as actors for lifelong learning against the background of the digital transformation.

Example: Advancement through Education: Open Universities

Source: [9], [20]

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Good practice

Smart Qualified

The joint German funding program "Smart Qualified" of the Stifterverband and the Daimler Fund is part of the initiative Future Skills and therefore supports universities in the strategic (further) development of academic continuing education as an educational mission in the digital age.

In this way, higher education institutions (HEIs) are to push ahead with their cooperation with companies in the development of continuing education programs for the world of work 4.0 or develop new formats of qualification for the target group of working people.

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Source: [21]

Key takeaways

- Digitalization means that pedagogical contents can be made more accessible to students.

- Contents can be delivered through different means and lectures can be organized in a way that is more relevant for a faster-moving digital generation.

- Learners are expecting a more dynamic and engaged form of education, they need fast, flexible and affordable learning solutions.

- The teachers' role has evolved and they are becoming coordinators, facilitators, coaches, mediators and creators of learning opportunities.

- Educators today have the responsibility to guide the development of 21st century skills in their students.

- Online learning, mobile learning, video-based learning, game-based learning, personalized learning and virtual reality- based learning are examples of the new trends in education.

- Learning methods such as flipped classroom, design thinking, cooperative learning and project-based learning help in the learning process.

- There is an increasing need to position universities as actors for lifelong learning.

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Unit 2: New software and apps to help learning providers to manage, plan, deliver and track the learning process

Module 3: New Educational Opportunities Created by Digital Technologies and Barriers to Going Digital

The ESCALATE Module 3 is composed by 3 units, the second of which is delivered through this document.

1. Accessible and flexible educational contents
2. **New software and apps to help learning providers to manage, plan, deliver and track the learning process**
3. Barriers to going digital

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The objectives of this Unit are:

- To get acquainted with the main tools available to manage, plan, deliver and track the learning process

- To learn about what digital learning management systems and e-learning platforms are

- To be aware of the most popular e-learning authoring tools

- To acknowledge the rapid up-take of videoconferencing tools

- To understand the main functionalities of the online assessment tools

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2.2.	e-learning authoring tools
2.3.	Communication tools
2.4.	Assessment tools

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2.1. Digital learning management systems and e-learning platforms

The systems that allow teaching and learning through the internet have received a number of different names throughout recent years: *web-based training, computer-mediated learning, e-learning systems, digital learning management systems, virtual learning environments and e-learning platforms*, are the most common terms used.

Regardless of their name, all these systems have the use of the Internet in common, and certain features that allow registration, assessment of the activities of learners and teachers, and that also facilitate the delivery of lectures and interaction between students, their colleagues and teachers.

In this Unit we will refer to these systems indistinctively either by e-learning platforms or by digital learning management systems.

Source: [1]

2.1. Digital learning management systems and e-learning platforms

The e-learning process in higher education takes place with the help of these online platforms.

When using such systems...

1. EDUCATORS can assign work, share course content, give homework and assignments, post grades and collaborate with the class...
2. LEARNERS can turn in their work, access course material, view grades, and collaborate and communicate with other students and the teacher...

The key features of these digital learning management systems and e-learning platforms geared towards higher education varies depending on the specific tool used, but all of them are designed to manage, plan, deliver and track the learning process.

Source: [2], [3]

2.1. Digital learning management systems and e-learning platforms

The main functionalities of e-learning platforms include:

Enable instructors to develop an educational workflow

- Offer a virtual space where learning courses and materials are hosted
- Aid teachers in managing their lectures and courses
- Create an educational workflow that makes sense for different environments including blended learning

- A real-time communication platform (web-conferences, chats...)
- Asynchronous communication channels, such as forums or conversation threads
- A one-to-one communication channel for teacher-student consultations

Collaborate within the system – both teacher with students and students with students

Create, administer, and grade homework, assignments, projects, quizzes, and tests.

- Possibility to monitor and evaluate students, give grades, to monitor course attendance
- Create, administer and score quizzes, tests, exams...
- View scores and progress
- Access to assignments and possibility to turn in work

- Create data and reports to track student progress
- Automatically generate reports based on the data collected, for example: student progress reporting, course time tracking, course feedback from the students, teacher assessment by students, student engagement and participation

Generate reports for students, teachers, and administrators

Enable mobile access

- A mobile version should be available for a more optimized experience
- Ability to access course material using cellular data

Source: [1], [2], [4]

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# 2.1. Digital learning management systems and e-learning platforms

Benefits
- student-centeredness
- flexibility
- improved interaction with students through embedded communication tools such as e-mail, forums, chats, videoconferences
- distribution of content at the same time, to a large number of users
- advantages to learners such as control over the content, control over the time spent learning, and thus the process can be adapted according to the learner needs and objectives of learning
- access to online courses and classes at learners' convenience and outside the reach of wired Internet connections

Challenges
- decreased motivation in students
- delayed feedback or help due to the fact that teachers are not always available at the time students may need help while learning
- feelings of isolation due to lack of physical presence of classmates
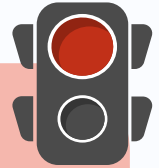
* Nonetheless, these challenges can be overcome with the help of teachers who should adapt their teaching strategies to the needs of students. In order to do so, experience and knowledge about teaching in the online environment are necessary.

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Source: [1]

2.1. Digital learning management systems and e-learning platforms

- There are many e-learning platforms that can be used in higher education.
  - Some are free (open platforms) and others are paid (commercial or proprietary)
  - Some offer just a structure or skeleton for a developer to set-up and others are fully-featured
- The most popular ones are listed below:

1 BLACKBOARD Fully functional. The system integrates with the student information system and has mobile and desktop versions. Includes an online web conferencing system.

2 SCHOOLOGY It includes built-in integrations so that tools such as YouTube, Google Drive and Dropbox, can be used directly within the system.

3 CANVAS Easy-to-use interface, Canvas has recently been gaining traction within higher education institutions (HEI). It can be tried for free.

4 BRIGHTSPACE Educators respect the insight and functionality the platform provides. It is not as easy as others, but it's functional and has standout features.

5 MOODLE One of the most popular learning management systems. While not as appealing and easy-to-use as its paid competitors, it offers everything a HEI needs.

6 SAKAI Open-source learning management system, Sakai is another popular choice among HEI. It offers APIs and community features.

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Source: [3]

Reflection

Explore

1. Take some time to visit the websites of the top learning management systems:
   - Blackboard https://www.blackboard.com/
   - Schoology https://www.schoology.com/
   - Canvas https://www.canvas.net/
   - Brightspace https://www.d2l.com/
   - Moodle https://moodle.org/ FREE!
   - Sakai https://www.sakailms.org/ FREE!

2. Which ones did you like better?

3. Do you know about other e-learning platforms?

4. Which one is used at your University?

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2.2. e-learning authoring tools

Four examples of the most popular e-learning authoring tools are described in the diagram:

iSpring Suite

PowerPoint-based toolkit for creating courses, quizzes, role-plays, and video lessons. You can add video narrations, shoot screencasts, etc. Once ready, upload the course to your learning management system.

Lectora

One of the most versatile authoring tools. You can create video-based, scenario-based and responsive learning materials, as well as conditional branching and sequenced events for a personalized learning experience.

Adobe Captivate

A rapid authoring tool that allows to create attractive, mobile-ready courses in minutes with new features and interactions. You can create interactive videos, buttons, VR hotspots and copy appearance and style.

https://www.lectoraonline.com/

https://www.ispringsolutions.com/ispring-suite

Articulate 360

Includes both Storyline 360 and Rise 360. With Storyline 360 you can develop custom, interactive courses with any interaction imaginable. With Rise 360 you can build fully responsive courses in minutes.

https://articulate.com/360

https://www.adobe.com/products/captivate.html

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Source: [11], [12], [13], [14]

2.3. Communication tools

Virtual classrooms

- Even before COVID-19, educators were already facing increasing demands for distance learning programmes and were already using video conferencing tools and apps.
- But then COVID-19 happened and virtual communication completely replaced the face-to-face classes.
- Thanks to these video conferencing tools, classes can go virtual and run much as they would in person, with lectures, presentations, and discussions.
- This new way of teaching and learning requires a bit of adjustment, but it can ultimately optimize learning.

As seen in sub-unit 2.1., most of the learning management systems or e-learning platforms offer a built-in communication/ collaboration tool for educators and learners to effectively communicate with each other. These include asynchronous communication tools such as discussion boards but also synchronous tools for videoconferencing and chatting.

Outside the e-learning platforms there are also powerful stand-alone tools and apps specifically designed for videoconferencing that are currently being used by higher education for the classes to take place virtually.

Either way, video conferencing solutions bring learners and educators together in a virtual space where they can discuss as they would in person.

Most tools are very intuitive and ensure easy operation, although we can face a learning curve as we adjust to new digital tools.

Source: [17]

Did you know...

Global top 5 conferencing tools in HE

The top five tools in Higher Education in June 2020 were **Zoom, Blackboard, Microsoft, Cosco Systems, and Panopto**, as published by the market research firm ListEdTech based on a survey to 2,800 higher education institutions.

Bigger institutions have more than one conferencing tool, in fact, more than half of institutions use more than one system.

Unsurprisingly, the survey also revealed that the year 2020 had the highest number of new implementations of conferencing systems in Higher Education.

Blackboard's market share is decreasing and seems to be tied up to its learning management system. Zoom and to a lesser rate, Microsoft, are the two systems that are increasing their new implementation rates. This is enhanced by the fact that the actual number of implementations is increasing.

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Source: [18]

2.4. Assessment tools

- Some of the functionalities offered by most online assessment tools are:

Create and register users for tests admission and assessment across web and mobile devices

Schedule evaluation activities like tests or interview or multiple tests

Update test scores in bulk

Evaluate applicants based on parameters or questions using an evaluation form

Create different assessment models with scoring pattern based on various parameters

Generate test card automatically with the photo of students

Automatically generate a list of students appearing for a given test/location

Track and compare progress of students for different periods

Set grades with weightage-based score to questions

Examples: Proofs Online Assessment Software https://www.proprofs.com/quiz-school/solutions/assessment-; ExamSoft: software/https://examsoft.com/

Source: [19]

Key takeaways

- Digital learning management systems and e-learning platforms are designed to manage, plan, deliver and track the learning process.

- There are many e-learning platforms that can be used in higher education, some of them are open platforms and others are commercial.

- E-learning authoring tools allow to create digital educational content, converting it into an eLearning format.

- Authoring Tools offer educators a friendly interface and predefined elements that facilitate the creation of materials through work based on icons, objects and option menus.

- Video conferencing tools allow classes to go virtual and run much as they would face-to-face, with lectures, presentations, and discussions.

- Video conferencing solutions bring learners and educators together in a virtual space where they can discuss as they would in person.

- Online evaluation tools allow educators to assess their students through the internet using assignments, tests, quizzes, surveys and evaluations.

- Higher education institutions are turning to online proctoring to prevent cheating during online exams. Proctoring methods can invade privacy and break trust so they must be used carefully.

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Unit 3: Barriers to going digital

Module 3: New Educational Opportunities Created by Digital Technologies and Barriers to Going Digital

The ESCALATE Module 3 is composed by 3 units, the third of which is delivered through this document.

1. Accessible and flexible educational contents
2. New software and apps to help learning providers to manage, plan, deliver and track the learning process
3. **Barriers to going digital**

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The objectives of this Unit are:

- To recognise the different types of inequalities related to digitalization

- To understand that there are gaps in the digital skills of both educators and learners

- To detect the barriers you may find when going digital

- To find ways to overcome these barriers

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3.1.   Inequalities on access to technology and to digital devices

3.2.   Digital skills of educators and learners

3.3.   Recommendations to overcome barriers

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3.1. Inequalities on access to technology and to digital devices

The existence of a digital gap in different groups related to education such as among teachers and students should be considered as a matter of concern.

Colleges and universities need to prepare their teachers and students for a world unlike ever before by bridging the digital divide in higher education.

Any attempts to examine inequalities in higher education need to focus on the issue of the digital divide in relation to internet and ICT use, as it constitutes a critical parameter which impacts on academic knowledge, students' performance and their transition to the labour market.

COVID-19 CRISIS The move online in response to COVID-19, while enabling students to finish classes remotely, may have aggravated existing inequalities, and, in some cases, even increased them.

Source: [1], [2], [3], [4], [5]

3.1. Inequalities on access to technology and to digital devices

Motivation

Physical access

Skills

Usage
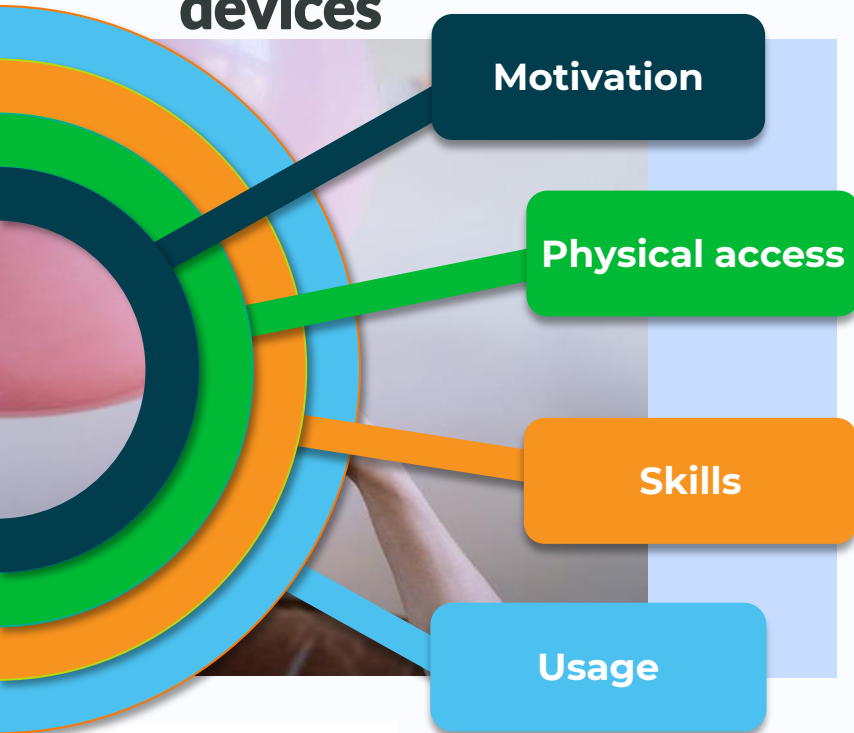
Access to digital technology has various dimensions, it is not just a matter of having physical access to the technology and the devices. Four levels must be considered:

Motivation: the willingness to welcome ICT and be connected. It is influenced by social, cultural and mental or psychological factors.

Physical access: ICT affordability and/ or ownership, authority or the right to use a device or service (e.g., the Internet and sufficient bandwidth). Ensuring adequate physical access by teachers and students is the first and foremost prerequisite for the exploitation of ICT in education.

Skills: the ICT literacy; the knowledge and experience in the use of technologies. There are operational, information and strategic skills

Usage: the actual use of ICT. Usage is largely linked to demographic characteristics of users (e.g., social class, education, age, gender and ethnicity).

Source: [8]

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Reflection

Staff and students' access to ICT

- What are the staff and students' access to digital technologies at four levels (motivational, physical, skills, and usage level)?

- Are there significant differences among their access to digital technologies at these four levels?

- How does the staff's ICT-access differ with respect to their age, gender, and the type of university?

- How does the students' ICT-access differ with respect to their social background?

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Source: [2]

3.2. Digital skills of educators and learners

- The capacity of technology is very much conditioned by the level of digital skills of the educators and learners.
- According to the European Commission, digital competence is the confident and critical use of digital technology and covers the knowledge, skills and attitudes that all citizens need in a rapidly evolving digital society.
- Higher education institutions are awakening to an urgent and widening issue: multiple digital skills gaps affecting their faculty and students with consequences reaching far beyond campuses.
- Gaps in the digital skills of both educators and learners have driven a wedge between expectations and reality. Higher education and governments must address these challenges or technology may do more harm than good.

Teachers are often not as digitally experienced as their students (with the exception of some enthusiastic educators). Therefore, teachers are not at ease using new technology and digital solutions in the classroom. University faculty must first possess the essential digital skills necessary to teach to their students.

If the degree of digital skills among students was harmonised, there would be less inequalities and the educators could better incorporate learning that all students can benefit from, instead of having to adjust to the weakest skillset.

Even if higher education students own digital devices and seem to be all the time connected, they still need to learn how and when to use the available technology and need recommendations on how to navigate the digital world, especially in a professional context.

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Source: [9], [10], [11]

3.2. Digital skills of educators and learners
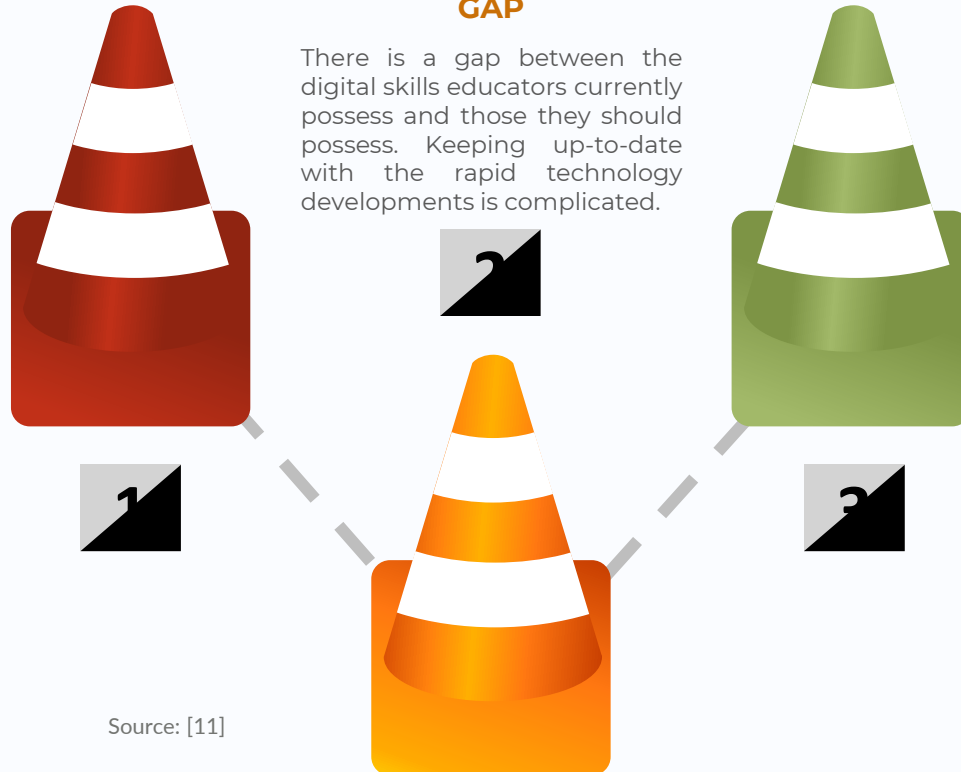
TECHNOLOGICAL SKILLS GAP

There is a gap between the digital skills educators currently possess and those they should possess. Keeping up-to-date with the rapid technology developments is complicated.

GENERATIONAL SKILLS GAP

There is a strong gap between the digital skills of students and those of faculty. Students are digital natives, while their teachers, typically, are not.

INEQUALITY SKILLS GAP

Not all students have the same level of digital skills. The majority of university students possess some digital skills, but to varying degrees.

Source: [11]

Reflection

Gaps in the digital skills

- Picture your university or college. Do you think there is a generational skills gap between educators and learners? Explain the difference in their attitudes towards the new technologies, gadgets and software.

- Now think about the teachers. Are they struggling to keep-up-to-date with the latest technological developments? How do they keep-up-to-date?

- Finally, picture the students. Do you perceive different levels of digital skills among them? Or is the level more or less harmonised?

- Have you noticed an uptake in digital skills after the COVID-19?

3.3. Recommendations to overcome barriers

- Inequalities on access to technology and gaps in the digital skills of both teachers and students are clearly standing in the way of the digital transformation of higher education.
- Other barriers according to the OECD include:

difficulties in locating high-quality digital learning resources and software

a lack of clarity over learning goals

insufficient pedagogical preparation on how to blend technology meaningfully into teaching

Source: [9]

3.3. Recommendations to overcome barriers

Going digital in education requires knowhow and involves adaptation and change. Here are ten recommendations included in the European Digital Education Action Plan:

To bring innovation and technology to the classroom, educators need **the right environment, infrastructure, devices and leadership support**

Need for an **approach that combines teacher training, curricula and educational materials** that are fit for digitally-supported teaching models

Need to provide a **framework** for issuing digitally-certified qualifications and validating digitally-acquired skills that can be stored in professional profiles such as Europass

Acquiring digital skills needs to start at **early age** and carry on throughout life

Closing the **gender gap** through digital and entrepreneurship education is vital if Europe is to fully embrace the benefits of the digital revolution

Build **evidence on the uptake** of ICT and digital skills in education institutions through publications and dissemination

Launch **artificial intelligence and learning analytics pilots** in education to improve implementation and monitoring of education policy
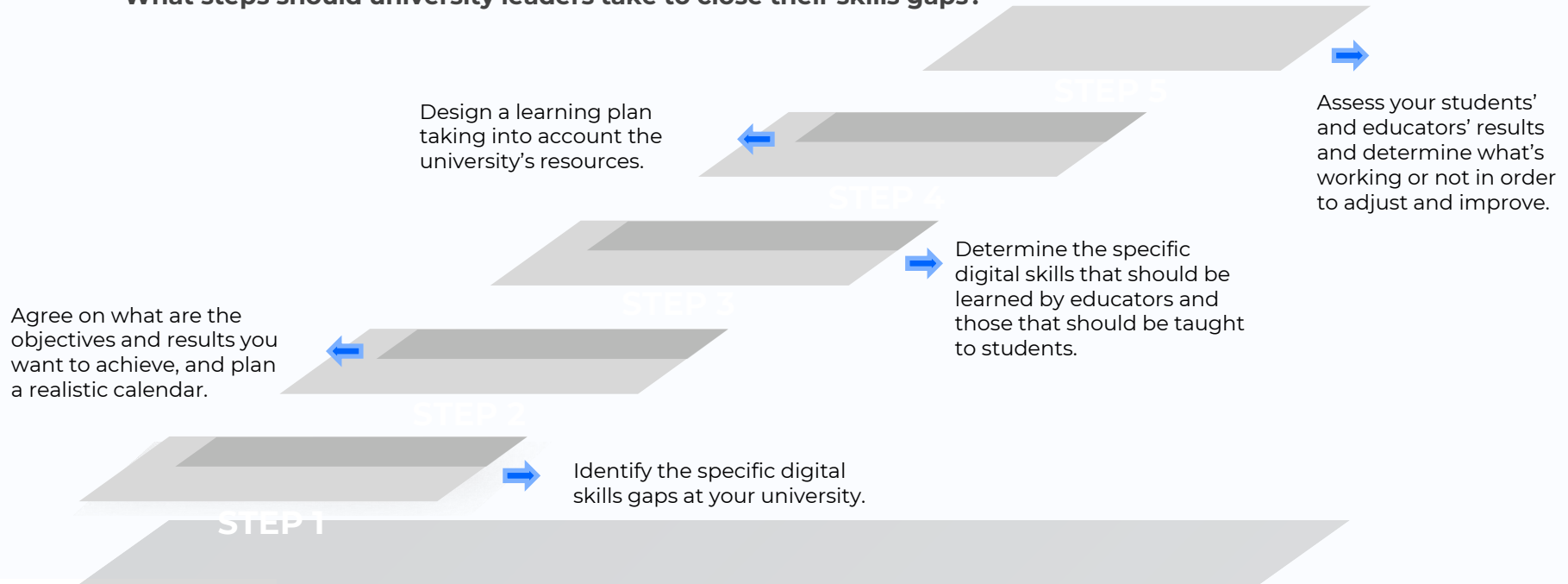
Initiate **strategic foresight** on key trends arising from digital transformation for the future of education systems, and making use EU-wide cooperation channels on education and training

Scale up innovative policies and practices, such as the **pockets of innovation** in digital education

To use the **European Digital Competence Framework for Educators** to offer teachers guidance in developing digital competence models

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Source: [10]

3.3. Recommendations to overcome barriers

- **What steps should university leaders take to close their skills gaps?**

STEP 5

Assess your students' and educators' results and determine what's working or not in order to adjust and improve.

Design a learning plan taking into account the university's resources.

STEP 4

Determine the specific digital skills that should be learned by educators and those that should be taught to students.

STEP 3

Agree on what are the objectives and results you want to achieve, and plan a realistic calendar.

STEP 2

Identify the specific digital skills gaps at your university.

STEP 1

Source: [11]

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Key takeaways

- Any attempts to examine inequalities in higher education need to focus on the issue of the digital divide in relation to internet and ICT use.

- While digital technologies have been a solution to the disruption caused by the pandemic and may improve higher education teaching in the long term, they can also be responsible for increasing the digital divide.

- Access to digital technology has 4 dimensions: motivation, physical access, skills and usage.

- The capacity of technology is very much conditioned by the level of digital skills of the educators and learners.

- Higher education institutions are identifying multiple digital skills gaps affecting their faculty and students: generational skills gap, technological skills gap and inequality skills gap.

- The European Digital Education Action Plan proposes some recommendations to overcome the barriers to going digital. These include the need for an adequate environment, infrastructure, devices and leadership support.

- The training of faculty in digital skills is essential.

- University leaders should adopt a Digitalisation Strategy that starts by identifying the skills gaps and closing them with a learning plan.
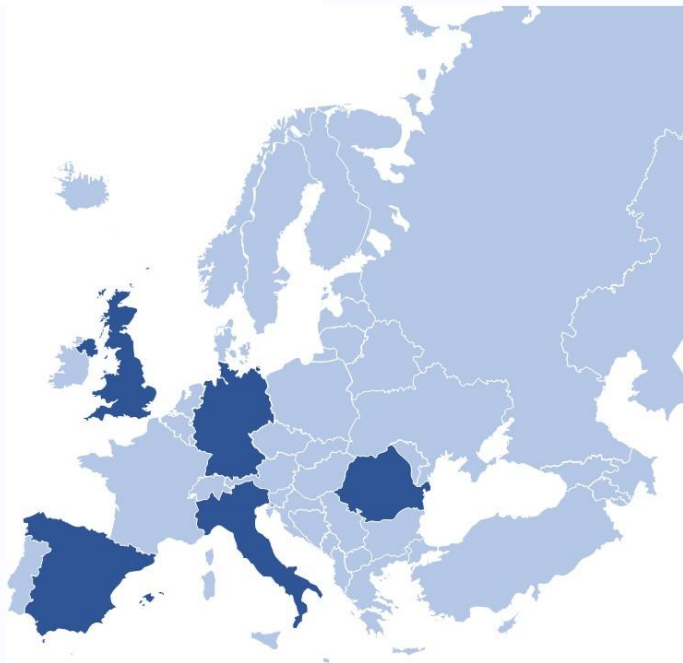
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Authors

Eugenia Atin, Oihana Hernaez and Raquel Serrano Prospektiker, Spain

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www.escalate.projects.uvt.ro
@DigitalEscalate

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